TEST REPORT

SCOPE: EMISSIONS, EFFICIENCY AND OUTPUT

FUEL: CORDWOOD

TEST STANDARD: EPA & CSA B415.1-10

MODEL: TUNDRA II WOOD FURNACE

Listing Report for Applicant

Issued: May 31 2017 12:19PM

Inspection Tests And Evaluation Of

SBI - Caddy / Heamax II / Tundra II emissions and efficiency (35728)

RENDERED TO

Stove Builder International Inc.
250, rue de Copenhague
St-Augustin-de-Desmaures, QC G3A 2H3
Canada

GENERAL: This Report gives the results of the inspection, tests and evaluation of the above for compliance with applicable requirements of the following standards : CSA B415.1 (2010)

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Correlation for Multiple Listees

Applicant/Basic Listee:

Stove Builder International Inc.
250, rue de Copenhague
St-Augustin-de-Desmaures, QC G3A 2H3
Canada

Applicant/Manufacturer(s):

Applicant/Manufacturer	Contact
Stove Builder International Inc. (Laguadeloupe)	Contact: Claude Pare Phone: 418-878-3040 ext 255 Fax: 418-878-3001 E-Mail: cpare@sbi-international.com

Parties Authorized to Apply Mark:

Company	Contact

PRODUCT DESCRIPTION

Product Covered:

SBI - Caddy / Heamax II / Tundra II emissions and efficiency

Product Description:

Product Covered

Caddy, Heatmax II, Tundra II Wood-fueled hot aired furnace

Emission results are as follows:

Maximum Delivered Output:	44,857	BTU/h
Minimum Delivered Output:	12,635	BTU/h
PM Emission Rate:	0.654	LB/MMBTU Output
CO Emission Rate:	1.766	g/min
Weighted Average Efficiency:	(Overall Thermal Efficiency (HHV): 76.7%)	
	(Overall Delivered Heat Efficiency (HHV): 62.7%)	
Test Fuel :	Cordwood	

Attribute	Value
Criteria	CSA B415.1 (2010)
CSI Code	10 30 00 Fireplaces and Stoves
Intertek Services	Certification
Listed or Inspected	LISTED
Listing Section	SOLID FUEL EMISSIONS AND EFFICIENCY
Report Number	101549667MTL-001
Spec ID	35728
Verification Testing	No

DRAWING INDEX

WHI16-21514305 Certificate of Compliance SBI - Caddy / Heamax II / Tundra II

WHI16-21514305 Certificate of Compliance SBI - Caddy / Heamax II / Tundra II

Intertek

Certificate of Conformity

Emissions – Forced Air Furnace

CSA B415.1

Certificate number: WHI16-21514305

Organization:

Company Name: Stove Builder International Inc.
Address: 250, rue de Copenhague
City, State: St-Augustin–de-Desmaures, Quebec
Zip Code:G3A 2H3
Country: Canada

This is a certificate of conformity to certify that the bearer has successfully completed the requirements of the above scheme which include the testing of products, the initial assessment, and are subject to continuing annual assessments of their compliance and testing of samples of products taken from production (as applicable to the scheme) and has been registered within the scheme for the products detailed.

Product: Model Caddy / Heatmax II / Tundra II Wood furnace
Maximum Delivered Output: 44 857 Btu/hour
Minimum Delivered Output: 12 635 Btu/hour
PM Emission Rate :0.654 LB/MMBTU output
CO Emissions Rate: 1.766g/min
Weighted Average Efficiency: (Overall Thermal Efficiency (HHV): 76.7%)
(Overall Delivered Heat Efficiency: 62.7%)
Test Fuel Type: Cordwood

Compliance: Certified to comply with 2016 particulate emissions standard.
Report Number: 101549667MTL-001

Certification body: Intertek Testing Services NA, Inc.
Initial registration: **October 19**, 2016
Date of expiry: **May 16**, 2020
Issue status: 2

Name	Signature	Date
Dustin Behling Certification Coordination Manager		18/May/2017

www.intertek.com

Registered address:
Intertek Testing Services NA, Inc. 545 E. Algonquin Rd. Arlington Heights, IL 60005 USA

The certificate and schedule are held in force by regular annual surveillance visits by Intertek Testing Services NA, Inc. and the reader or user should contact Intertek to validate its status. This certificate remains the property of Intertek Testing Services NA, Inc. and must be returned to them on demand. This Certificate is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this certificate. Only the Client is authorized to permit copying or distribution of this certificate and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

MANUFACTURING INFORMATION

The model Caddy Solid Fuel Wood Furnace is a free standing manually fed wood furnace constructed of carbon steel with a fire chamber lined with firebrick.

The outer dimensions are 27-inches wide, 48-inches high and 52-inches deep.

The unit has a front door with a viewing glass and an automatically controlled blower at the back based on temperature in the duct through which it distributes heat.

(See product drawings and component description in Appendix D) of the report

Products Heatmax II and Tundra II are identical to Caddy model with aesthetic modifications.

SIGNATURE PAGE

Reported By:

Claude Pelland, P.Eng.
Staff Engineer
Intertek Lachine

Reviewed By:

Ken Slater
Technician 1
Building Products

DRAWING INDEX

Caddy - Owner's manual English
Caddy - Owner's manual French
Caddy label 1
Caddy Label 2
HeatMax Label 1
HeatMax Label 2
Tundra II Label 1
Tundra II Label 2

Caddy label 1

Intertek

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon CSA B366.1
Conforms to/Conforme à UL 391
Conforms to/Conforme à CSA B415.1-10
Conforms to/Conforme à ASTM E2515-2011
(MARCH / MARS 2016)

PERFORMANCE TESTING OF SOLID-FUEL BURNING HEATING APPLIANCE

RENDEMENT D'APPAREIL DE CHAUFFAGE À COMBUSTION SOLIDE

MODEL / MODÈLE :
CADDY

PERFORMANCE TECHNICAL DATA FROM CSA B-415.1-10 / DONNÉES TECHNIQUES DE PERFORMANCE RELATIVE À LA NORME CSA B-415.1-10

- The stated efficiency is based on the higher heating value of the fuel.
- The minimum and maximum delivered heat output rate are based on the tests performed in determining the average emissions rates.
- The average efficiency is based on the amount of delivered heat.

- Le rendement annoncé est basé sur le pouvoir calorifique supérieur du combustible.
- Les puissances thermiques minimales et maximales sont basées sur les essais réalisés pour la détermination du taux moyen d'émission de particules.
- Le rendement moyen est basé sur la quantité de chaleur transportée.

AVERAGE PARTICULATE EMISSION RATE / TAUX MOYEN D'ÉMISSION DE PARTICULE:	0.654 lb/mmBTU 0.282 g/MJ	MINIMUM DELIVERED HEAT OUTPUT RATE / PUISSANCE THERMIQUE MINIMALE:	13, 322 kJ/h
AVERAGE EFFICIENCY / RENDEMENT MOYEN:	62.7%	MAXIMUM DELIVERED HEAT OUTPUT RATE / PUISSANCE THERMIQUE MAXIMALE:	47, 295 kJ/h
AVERAGE OVERALL EFFICIENCY / RENDEMENT MOYEN GLOBAL:	76.7%	MINIMUM OVERALL HEAT OUTPUT RATE / PUISSANCE THERMIQUE GLOBALE MINIMALE:	16, 273 kJ/h
AVERAGE ELECTRICAL POWER CONSUMPTION / CONSOMMATION D'ÉLECTRICITÉ MOYENNE:	0.43 kW/h	MAXIMUM OVERALL HEAT OUTPUT RATE / PUISSANCE THERMIQUE GLOBALE MAXIMALE:	52, 327 kJ/h

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2015 particulate emission standards. Not approved for sale after May 15, 2020. / AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.U. (EPA). Conforme aux normes d'émission de particules de 2015. Ne peut être vendu après le 15 mai 2020.

This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. / Cet appareil requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information.

It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual. / Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

DANGER: Risk of fire or explosion
- Do not burn garbage, gasoline, drain oil or other flammable liquids.

WARNING: Risk of fire
- Do not operate with flue draft exceeding 0.06" W.C. (15Pa).
- Do not operate with fuel loading or ash removal doors open.
- Do not store fuel or other combustible material within marked installation clearances.
- Inspect and clean flues and chimney regularly.

CAUTION: Hot surfaces
- Keep children away.
- Do not touch during operation.

DANGER: Risque d'incendies ou d'explosion
- Ne pas brûler d'ordures, d'essence, d'huile moteur ou tout autre liquides inflammable.

AVERTISSEMENT: Risque d'incendies
- Ne pas utiliser si le tirage excède 0.06" C.E. (15Pa).
- Ne pas utiliser avec les portes d'accès et/ou de chargement ouverte.
- Ne pas entreposer de combustible ou matériaux combustibles à l'intérieur des dégagements prescrits.
- Inspecter et nettoyer le conduit de raccordement ainsi que la cheminée fréquemment.

TECHNICAL DATA
DONNÉES TECHNIQUES

Blower / Ventilateur	DD-10 1/3 HP
Max Output T°/ T° max Sortie	201 °F 94 °C
Ext. Static Pressure/ Pression Statique Ext.	0.2" - 0.5" W.C. 0.2" - 0.5" C.E.
Electrical Rating / Alimentation Électrique	120V, 4.7 AMPS, 60Hz

PROCEDURE TO FOLLOW IN CASE OF RUN-AWAY FIRE
1) Turn down thermostat
2) Keep fuel door closed
3) Close all combustion air controls

EN CAS D'INCENDIE DE CHEMINÉE
1) Baisser le thermostat
2) Maintenir la porte de chargement fermée
3) Fermer tous les dispositifs d'admission d'air

Made in La Guadeloupe (Qc), Canada
25/04/2017 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à La Guadeloupe (Qc), Canada
25/04/2017 (# test)

27662

Caddy Label 2

Intertek

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon CSA B366.1
Conforms to/Conforme à UL 391
Conforms to/Conforme à CSA B415.1-10
Conforms to/Conforme à ASTM E2515-2011
(MARCH / MARS 2016)

LISTED SOLID FUEL FIRED CENTRAL FURNACE

FOURNAISE CENTRALE À COMBUSTIBLE SOLIDE HOMOLOGUÉE

MODEL / MODÈLE :
CADDY

Options : Oil Unit / Unité à l'huile
Electric Unit / Unité Électrique

Serial Number / No. de Série: 999999

FOR USE WITH WOOD ONLY — POUR UTILISATION AVEC BOIS SEULEMENT

CONTACT LOCAL BUILDING OFFICIALS ABOUT THE RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA.

COMMUNIQUER AVEC LES AUTORITÉS LOCALES DU BÂTIMENT ET DE LA PRÉVENTION DES INCENDIES AU SUJET DES RESTRICTIONS D'INSTALLATION DANS VOTRE SECTEUR.

FUEL / COMBUSTIBLE : WOOD / BOIS
AC CURRENT ONLY / COURANT CA SEULEMENT

CAUTION : Use copper wire no.12 AWG suitable for 167°F.

ATTENTION : Employer des fils d'alimentation adéquats pour 75°C.

INSTALL AND USE ONLY IN ACCORDANCE WITH SBI STOVE BUILDER INTERNATIONAL INSTALLATION AND OPERATION INSTRUCTIONS.

L'INSTALLATION ET L'OPERATION DOIT SE FAIRE SELON LES INSTRUCTIONS D'INSTALLATION ET D'UTILISATION DE SBI FABRICANT DE POÊLES INTERNATIONAL.

PREVENT HOUSE FIRES

- Type of chimney: chimney suitable for use with solid fuel.
- Use with wood only. Do not use other fuels.
- Load fuel carefully, or damage may results.
- Do not use chemicals or fluids to start the fire.
- The heat exchanger, flue pipe and chimney must be cleaned regularly to remove accumulated creosote and ash. Ensure that the heat exchanger, flue pipe and chimney are cleaned during the summer months. The appliance, flue pipe and chimney must be in good condition.
- Do not use this furnace without ducts.
- In the USA, the unit must be installed on a non-combustible floor pad extending at least 16 inches (410 mm) in front of the door opening and at least 8 inches (205 mm) on each side of the door opening. In Canada, the unit must be installed on a non-combustible floor pad extending at least 18 inches (460 mm) in front of the door opening and at least 8 inches (205 mm) at the back and on each side of the unit. The floor pad must have a thickness of at least 0.015" (0.38mm). Consult owner's manual for more details.
- May be connected to ductwork that is still connected to another furnace.
- Do not connect this unit to a chimney flue serving another appliance.
- Do not connect ductwork so that reverse flow is possible.
- Do not relocate or bypass any of the safety controls in the original furnace installation.
- Caution: Maintain combustion air to the unit, air starvation is dangerous.
- The furnace can be used during a power-loss. Remove air filter and let the damper stay in closed position. See owner's manual for optimum performance under those conditions.
- Do not attempt to light a fire when there is oil vapor present.
- See owner's manual for electrical diagram.
- For more information, refer to owner's manual.

PRÉVENEZ LES INCENDIES

- Type de cheminée: cheminée conçue pour utilisation avec combustible solide.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Charger avec soin pour éviter d'endommager la fournaise.
- N'utiliser aucun produit chimique ou liquide pour allumer le feu.
- Nettoyer l'échangeur de chaleur, le conduit de raccordement et la cheminée pour enlever la créosote et les cendres accumulées. S'assurer que l'échangeur de chaleur, le conduit de raccordement et la cheminée sont nettoyés à la fin de la saison hivernale. L'appareil, le conduit de raccordement et la cheminée doivent être en bon état.
- Ne pas utiliser cette fournaise sans conduit.
- Aux USA, l'appareil doit être installé sur une plaque incombustible qui excède le devant de l'ouverture de porte d'au moins 16 pouces (410 mm) ainsi que chaque côté de l'ouverture de porte d'au moins 8 pouces (205 mm). Au Canada, l'appareil doit être installé sur une plaque incombustible qui excède le devant de l'ouverture de porte d'au moins 18 pouces (460 mm) ainsi que l'arrière et chaque côté de l'appareil d'au moins 8 pouces (205 mm). La plaque incombustible doit posséder une épaisseur minimale de 0.015" (0.38 mm). Consultez le manuel d'instructions pour plus de détails.
- Peut-être raccordé à des conduits raccordés à un autre générateur d'air chaud.
- Ne pas brancher cette unité à une cheminée servant à un autre appareil.
- Ne pas raccorder aux conduits de ventilation de façon à permettre un débit inversé.
- Ne pas relocaliser ou contourner les contrôles de sécurité originaux de la fournaise.
- Attention: Assurer l'air de combustion adéquate à l'appareil, une privation d'air est dangereuse.
- Cette fournaise peut être utilisée lors d'une panne de courant. Le filtre à air doit être retiré et le registre d'entrée d'air doit être laissé fermé. Voir le manuel d'instructions pour des performances optimales dans ces conditions.
- Ne pas allumer lorsque des vapeurs d'huile sont présentes.
- Voir le manuel d'instructions pour les diagrammes électriques.
- Pour de plus amples renseignements, référez-vous au manuel d'instructions.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS		DÉGAGEMENTS MINIMUM AUX MATÉRIAUX COMBUSTIBLES	
Ceiling (1st 6 feet ofductwork including plenum) :	6 in	Plafond (1er 6 pieds de conduit incluant le bonnet) :	150 mm
Plenum past 6 feet:	1 in	Conduit passé 6 pieds:	25 mm
Back Wall :	24 in	Mur arrière :	610 mm
Front Wall :	48 in	Mur avant :	1220 mm
Right Side Wall :	6 in	Mur latéral droit :	150 mm
Left Side Wall :	24 in	Mur latéral gauche :	610 mm
Floor :	0 in	Plancher :	0 mm
Flue Pipe :	18 in	Tuyau à fumée :	457 mm

Made in La Guadeloupe (Qc), Canada
25/04/2017 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à La Guadeloupe (Qc), Canada
25/04/2017 (# test)

27661

HeatMax Label 1

Intertek

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon CSA B366.1
UL391
Conforms to/Conforme à CSA B415.1-10
Conforms to/Conforme à ASTM E2515-2011
(OCT / OCT 2015)

PERFORMANCE TESTING OF SOLID-FUEL BURNING HEATING APPLIANCE

RENDEMENT D'APPAREIL DE CHAUFFAGE À COMBUSTION SOLIDE

MODEL / MODÈLE :
HEATMAX II

PERFORMANCE TECHNICAL DATA FROM CSA B-415.1-10 / DONNÉES TECHNIQUES DE PERFORMANCE RELATIVE À LA NORME CSA B-415.1-10

- The stated efficiency is based on the higher heating value of the fuel.
- The minimum and maximum delivered heat output rate are based on the tests performed in determining the average emissions rates.
- The average efficiency is based on the amount of delivered heat.

- Le rendement annoncé est basé sur le pouvoir calorifique supérieur du combustible.
- Les puissances thermiques minimales et maximales sont basées sur les essais réalisés pour la détermination du taux moyen d'émission de particules.
- Le rendement moyen est basé sur la quantité de chaleur transportée.

AVERAGE PARTICULATE EMISSION RATE / TAUX MOYEN D'ÉMISSION DE PARTICULE:	0.654 lb/mmBTU 0.282 g/MJ	MINIMUM DELIVERED HEAT OUTPUT RATE / PUISSANCE THERMIQUE MINIMALE:	13, 322 kJ/h
AVERAGE EFFICIENCY / RENDEMENT MOYEN:	62.7%	MAXIMUM DELIVERED HEAT OUTPUT RATE / PUISSANCE THERMIQUE MAXIMALE:	47, 295 kJ/h
AVERAGE OVERALL EFFICIENCY / RENDEMENT MOYEN GLOBAL:	76.7%	MINIMUM OVERALL HEAT OUTPUT RATE / PUISSANCE THERMIQUE GLOBALE MINIMALE:	16, 273 kJ/h
AVERAGE ELECTRICAL POWER CONSUMPTION / CONSOMMATION D'ÉLECTRICITÉ MOYENNE:	0.43 kW/h	MAXIMUM OVERALL HEAT OUTPUT RATE / PUISSANCE THERMIQUE GLOBALE MAXIMALE:	52, 327 kJ/h

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2015 particulate emission standards. Not approved for sale after May 15, 2020. / AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.U. (EPA). Conforme aux normes d'émission de particules de 2015. Ne peut être vendu après le 15 mai 2020.

This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. / Cet appareil requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information.

It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual. / Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

DANGER: Risk of fire or explosion
- Do not burn garbage, gasoline, drain oil or other flammable liquids.

WARNING: Risk of fire
- Do not operate with flue draft exceeding 0.06" W.C. (15Pa).
- Do not operate with fuel loading or ash removal doors open.
- Do not store fuel or other combustible material within marked installation clearances.
- Inspect and clean flues and chimney regularly.

CAUTION: Hot surfaces
- Keep children away.
- Do not touch during operation.

DANGER: Risque d'incendies ou d'explosion
- Ne pas brûler d'ordures, d'essence, d'huile moteur ou tout autre liquides inflammable.

AVERTISSEMENT: Risque d'incendies
- Ne pas utiliser si le tirage excède 0.06" C.E. (15Pa).
- Ne pas utiliser avec les portes d'accès et/ou de chargement ouverte.
- Ne pas entreposer de combustible ou matériaux combustibles à l'intérieur des dégagements prescrits.
- Inspecter et nettoyer le conduit de raccordement ainsi que la cheminée fréquemment.

TECHNICAL DATA
DONNÉES TECHNIQUES

Blower / Ventilateur	DCT-905-800-5
Max Output T°/ T° max Sortie	1/4 HP 190 °F 88 °C
Ext. Static Pressure/ Pression Statique Ext.	0.2" W.C. 0.2" C.E.
Electrical Rating / Alimentation Électrique	120V, 2.8 AMPS, 60Hz

PROCEDURE TO FOLLOW IN CASE OF RUN-AWAY FIRE
1) Turn down thermostat
2) Keep fuel door closed
3) Close all combustion air controls

EN CAS D'INCENDIE DE CHEMINÉE
1) Baisser le thermostat
2) Maintenir la porte de chargement fermée
3) Fermer tous les dispositifs d'admission d'air

Made in La Guadeloupe (Qc), Canada
25/04/2017 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à La Guadeloupe (Qc), Canada
25/04/2017 (# test)

27660

HeatMax Label 2

Intertek

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon CSA B366.1
UL391
Conforms to/Conforme à CSA B415.1-10
Conforms to/Conforme à ASTM E2515-2011
(OCT / OCT 2015)

LISTED SOLID FUEL FIRED CENTRAL FURNACE

FOURNAISE CENTRALE À COMBUSTIBLE SOLIDE HOMOLOGUÉE

MODEL / MODÈLE :
HEATMAX II

Options :

Serial Number / No. de Série: 1

FOR USE WITH WOOD ONLY — POUR UTILISATION AVEC BOIS SEULEMENT

CONTACT LOCAL BUILDING OFFICIALS ABOUT THE RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA.

COMMUNIQUER AVEC LES AUTORITÉS LOCALES DU BÂTIMENT ET DE LA PRÉVENTION DES INCENDIES AU SUJET DES RESTRICTIONS D'INSTALLATION DANS VOTRE SECTEUR.

FUEL / COMBUSTIBLE : WOOD / BOIS
AC CURRENT ONLY / COURANT CA SEULEMENT

CAUTION : Use copper wire no.12 AWG suitable for 167°F.

ATTENTION : Employer des fils d'alimentation adéquats pour 75°C.

INSTALL AND USE ONLY IN ACCORDANCE WITH SBI STOVE BUILDER INTERNATIONAL INSTALLATION AND OPERATION INSTRUCTIONS.

L'INSTALLATION ET L'OPERATION DOIT SE FAIRE SELON LES INSTRUCTIONS D'INSTALLATION ET D'UTILISATION DE SBI FABRICANT DE POÊLES INTERNATIONAL.

PREVENT HOUSE FIRES

- Type of chimney: chimney suitable for use with solid fuel.
- Use with wood only. Do not use other fuels.
- Load fuel carefully, or damage may results.
- Do not use chemicals or fluids to start the fire.
- The heat exchanger, flue pipe and chimney must be cleaned regularly to remove accumulated creosote and ash. Ensure that the heat exchanger, flue pipe and chimney are cleaned during the summer months. The appliance, flue pipe and chimney must be in good condition.
- Do not use this furnace without ducts.
- In the USA, the unit must be installed on a non-combustible floor pad extending at least 16 inches (410 mm) in front of the door opening and at least 8 inches (205 mm) on each side of the door opening. In Canada, the unit must be installed on a non-combustible floor pad extending at least 18 inches (460 mm) in front of the door opening and at least 8 inches (205 mm) at the back and on each side of the unit. The floor pad must have a thickness of at least 0.015" (0.38mm). Consult owner's manual for more details.
- May be connected to ductwork that is still connected to another furnace.
- **Do not connect this unit to a chimney flue serving another appliance.**
- Do not connect ductwork so that reverse flow is possible.
- Do not relocate or bypass any of the safety controls in the original furnace installation.
- Caution: Maintain combustion air to the unit, air starvation is dangerous.
- **The furnace can be used during a power-loss. Remove air filter and let the damper stay in closed position. See owner's manual for optimum performance under those conditions.**
- Do not attempt to light a fire when there is oil vapor present.
- See owner's manual for electrical diagram.
- For more information, refer to owner's manual.

PRÉVENEZ LES INCENDIES

- Type de cheminée: cheminée conçue pour utilisation avec combustible solide.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Charger avec soin pour éviter d'endommager la fournaise.
- N'utiliser aucun produit chimique ou liquide pour allumer le feu.
- Nettoyer l'échangeur de chaleur, le conduit de raccordement et la cheminée pour enlever la créosote et les cendres accumulées. S'assurer que l'échangeur de chaleur, le conduit de raccordement et la cheminée sont nettoyés à la fin de la saison hivernale. L'appareil, le conduit de raccordement et la cheminée doivent être en bon état.
- Ne pas utiliser cette fournaise sans conduit.
- Aux USA, l'appareil doit être installé sur une plaque incombustible qui excède le devant de l'ouverture de porte d'au moins 16 pouces (410 mm) ainsi que chaque côté de l'ouverture de porte d'au moins 8 pouces (205 mm). Au Canada, l'appareil doit être installé sur une plaque incombustible qui excède le devant de l'ouverture de porte d'au moins 18 pouces (460 mm) ainsi que l'arrière et chaque côté de l'appareil d'au moins 8 pouces (205 mm). La plaque incombustible doit posséder une épaisseur minimale de 0.015" (0.38 mm). Consultez le manuel d'instructions pour plus de détails.
- Peut-être raccordé à des conduits raccordés à un autre générateur d'air chaud.
- **Ne pas brancher cette unité à une cheminée servant à un autre appareil.**
- Ne pas raccorder aux conduits de ventilation de façon à permettre un débit inversé.
- Ne pas relocaliser ou contourner les contrôles de sécurité originaux de la fournaise.
- Attention: Assurer l'air de combustion adéquate à l'appareil, une privation d'air est dangereuse.
- **Cette fournaise peut être utilisée lors d'une panne de courant. Le filtre à air doit être retiré et le registre d'entrée d'air doit être laissé fermé. Voir le manuel d'instructions pour des performances optimales dans ces conditions.**
- Ne pas allumer lorsque des vapeurs d'huile sont présentes.
- Voir le manuel d'instructions pour les diagrammes électriques.
- Pour de plus amples renseignements, référez-vous au manuel d'instructions.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS / DÉGAGEMENTS MINIMUM AUX MATÉRIAUX COMBUSTIBLES

Ceiling from plenum:Ceiling from conduit:	5 in	Plafond du bonnet: Plafond des conduits:	127 mm
Plenum past 6 feet:	1 in	Conduit passé 6 pieds:	25 mm
Back Wall :	16 in	Mur arrière :	406 mm
Front Wall :	48 in	Mur avant :	1220 mm
Right Side Wall :	24 in	Mur latéral droit :	610 mm
Left Side Wall :	11 in	Mur latéral gauche :	279 mm
Floor :	0 in	Plancher :	0 mm
Flue Pipe :	18 in	Tuyau à fumée :	457 mm

Made in La Guadeloupe (Qc), Canada
25/04/2017 (# test)

Fabrication de poêles international
Stove Builder International

Fabriqué à La Guadeloupe (Qc), Canada
25/04/2017 (# test)

27659

Tundra II Label 1

Intertek

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon CSA B366.1
Conforms to/Conforme à UL 391
Conforms to/Conforme à CSA B415.1-10
Conforms to/Conforme à ASTM E2515-2011
(OCT / OCT 2015)

PERFORMANCE TESTING OF SOLID-FUEL BURNING HEATING APPLIANCE

RENDEMENT D'APPAREIL DE CHAUFFAGE À COMBUSTION SOLIDE

MODEL / MODÈLE :
TUNDRA II

PERFORMANCE TECHNICAL DATA FROM CSA B-415.1-10 / DONNÉES TECHNIQUES DE PERFORMANCE RELATIVE À LA NORME CSA B-415.1-10

- The stated efficiency is based on the higher heating value of the fuel.
- The minimum and maximum delivered heat output rate are based on the tests performed in determining the average emissions rates.
- The average efficiency is based on the amount of delivered heat.

- Le rendement annoncé est basé sur le pouvoir calorifique supérieur du combustible.
- Les puissances thermiques minimales et maximales sont basées sur les essais réalisés pour la détermination du taux moyen d'émission de particules.
- Le rendement moyen est basé sur la quantité de chaleur transportée.

AVERAGE PARTICULATE EMISSION RATE / TAUX MOYEN D'ÉMISSION DE PARTICULE:	0.654 lb/mmBTU 0.282 g/MJ
AVERAGE EFFICIENCY / RENDEMENT MOYEN:	62.7%
AVERAGE OVERALL EFFICIENCY / RENDEMENT MOYEN GLOBAL:	76.7%
AVERAGE ELECTRICAL POWER CONSUMPTION / CONSOMMATION D'ÉLECTRICITÉ MOYENNE:	0.43 kW/h
MINIMUM DELIVERED HEAT OUTPUT RATE / PUISSANCE THERMIQUE MINIMALE:	13, 322 kJ/h
MAXIMUM DELIVERED HEAT OUTPUT RATE / PUISSANCE THERMIQUE MAXIMALE:	47, 295 kJ/h
MINIMUM OVERALL HEAT OUTPUT RATE / PUISSANCE THERMIQUE GLOBALE MINIMALE:	16, 273 kJ/h
MAXIMUM OVERALL HEAT OUTPUT RATE / PUISSANCE THERMIQUE GLOBALE MAXIMALE:	52, 327 kJ/h

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2015 particulate emission standards. Not approved for sale after May 15, 2020. / AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.U. (EPA). Conforme aux normes d'émission de particules de 2015. Ne peut être vendu après le 15 mai 2020.

This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. / Cet appareil requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information.

It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual. / Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

DANGER: Risk of fire or explosion
- Do not burn garbage, gasoline, drain oil or other flammable liquids.

WARNING: Risk of fire
- Do not operate with flue draft exceeding 0.06" W.C. (15Pa).
- Do not operate with fuel loading or ash removal doors open.
- Do not store fuel or other combustible material within marked installation clearances.
- Inspect and clean flues and chimney regularly.

CAUTION: Hot surfaces
- Keep children away.
- Do not touch during operation.

DANGER: Risque d'incendies ou d'explosion
- Ne pas brûler d'ordures, d'essence, d'huile moteur ou tout autre liquides inflammable.

AVERTISSEMENT: Risque d'incendies
- Ne pas utiliser si le tirage excède 0.06" C.E. (15Pa).
- Ne pas utiliser avec les portes d'accès et/ou de chargement ouverte.
- Ne pas entreposer de combustible ou matériaux combustibles à l'intérieur des dégagements prescrits.
- Inspecter et nettoyer le conduit de raccordement ainsi que la cheminée fréquemment.

TECHNICAL DATA
DONNÉES TECHNIQUES

Blower / Ventilateur	DCT-905-800-5 1/4 HP
Max Output T°/ T° max Sortie	190 °F 88 °C
Ext. Static Pressure/ Pression Statique Ext.	0.2" W.C. 0.2" C.E.
Electrical Rating / Alimentation Électrique	120V, 2.8 AMPS, 60Hz

PROCEDURE TO FOLLOW IN CASE OF RUN-AWAY FIRE
1) Turn down thermostat
2) Keep fuel door closed
3) Close all combustion air controls

EN CAS D'INCENDIE DE CHEMINÉE
1) Baisser le thermostat
2) Maintenir la porte de chargement fermée
3) Fermer tous les dispositifs d'admission d'air

Made in La Guadeloupe (Qc), Canada
25/04/2017 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à La Guadeloupe (Qc), Canada
25/04/2017 (# test)

27658

Tundra II Label 2

Intertek

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon CSA B366.1
Conforms to/Conforme à UL 391
Conforms to/Conforme à CSA B415.1-10
Conforms to/Conforme à ASTM E2515-2011
(OCT / OCT 2015)

LISTED SOLID FUEL FIRED CENTRAL FURNACE

FOURNAISE CENTRALE À COMBUSTIBLE SOLIDE HOMOLOGUÉE

MODEL / MODÈLE :
TUNDRA II

Options :

Serial Number / No. de Série: 0

FOR USE WITH WOOD ONLY — POUR UTILISATION AVEC BOIS SEULEMENT

CONTACT LOCAL BUILDING OFFICIALS ABOUT THE RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA.

COMMUNIQUER AVEC LES AUTORITÉS LOCALES DU BÂTIMENT ET DE LA PRÉVENTION DES INCENDIES AU SUJET DES RESTRICTIONS D'INSTALLATION DANS VOTRE SECTEUR.

FUEL / COMBUSTIBLE : WOOD / BOIS
AC CURRENT ONLY / COURANT CA SEULEMENT

CAUTION : Use copper wire no.12 AWG suitable for 167°F.

ATTENTION : Employer des fils d'alimentation adéquats pour 75°C.

INSTALL AND USE ONLY IN ACCORDANCE WITH SBI STOVE BUILDER INTERNATIONAL INSTALLATION AND OPERATION INSTRUCTIONS.

L'INSTALLATION ET L'OPERATION DOIT SE FAIRE SELON LES INSTRUCTIONS D'INSTALLATION ET D'UTILISATION DE SBI FABRICANT DE POÊLES INTERNATIONAL.

PREVENT HOUSE FIRES

- Type of chimney: chimney suitable for use with solid fuel.
- Use with wood only. Do not use other fuels.
- Load fuel carefully, or damage may results.
- Do not use chemicals or fluids to start the fire.
- The heat exchanger, flue pipe and chimney must be cleaned regularly to remove accumulated creosote and ash. Ensure that the heat exchanger, flue pipe and chimney are cleaned during the summer months. The appliance, flue pipe and chimney must be in good condition.
- Do not use this furnace without ducts.
- In the USA, the unit must be installed on a non-combustible floor pad extending at least 16 inches (410 mm) in front of the door opening and at least 8 inches (205 mm) on each side of the door opening. In Canada, the unit must be installed on a non-combustible floor pad extending at least 18 inches (460 mm) in front of the door opening and at least 8 inches (205 mm) at the back and on each side of the unit. The floor pad must have a thickness of at least 0.015" (0.38mm). Consult owner's manual for more details.
- May be connected to ductwork that is still connected to another furnace.
- Do not connect this unit to a chimney flue serving another appliance.
- Do not connect ductwork so that reverse flow is possible.
- Do not relocate or bypass any of the safety controls in the original furnace installation.
- Caution: Maintain combustion air to the unit, air starvation is dangerous.
- The furnace can be used during a power-loss. Remove air filter and let the damper stay in closed position. See owner's manual for optimum performance under those conditions.
- Do not attempt to light a fire when there is oil vapor present.
- See owner's manual for electrical diagram.
- For more information, refer to owner's manual.

PRÉVENEZ LES INCENDIES

- Type de cheminée: cheminée conçue pour utilisation avec combustible solide.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Charger avec soin pour éviter d'endommager la fournaise.
- N'utiliser aucun produit chimique ou liquide pour allumer le feu.
- Nettoyer l'échangeur de chaleur, le conduit de raccordement et la cheminée pour enlever la créosote et les cendres accumulées. S'assurer que l'échangeur de chaleur, le conduit de raccordement et la cheminée sont nettoyés à la fin de la saison hivernale. L'appareil, le conduit de raccordement et la cheminée doivent être en bon état.
- Ne pas utiliser cette fournaise sans conduit.
- Aux USA, l'appareil doit être installé sur une plaque incombustible qui excède le devant de l'ouverture de porte d'au moins 16 pouces (410 mm) ainsi que chaque côté de l'ouverture de porte d'au moins 8 pouces (205 mm). Au Canada, l'appareil doit être installé sur une plaque incombustible qui excède le devant de l'ouverture de porte d'au moins 18 pouces (460 mm) ainsi que l'arrière et chaque côté de l'appareil d'au moins 8 pouces (205 mm). La plaque incombustible doit posséder une épaisseur minimale de 0.015" (0.38 mm). Consultez le manuel d'instructions pour plus de détails.
- Peut-être raccordé à des conduits raccordés à un autre générateur d'air chaud.
- Ne pas brancher cette unité à une cheminée servant à un autre appareil.
- Ne pas raccorder aux conduits de ventilation de façon à permettre un débit inversé.
- Ne pas relocaliser ou contourner les contrôles de sécurité originaux de la fournaise.
- Attention: Assurer l'air de combustion adéquate à l'appareil, une privation d'air est dangereuse.
- Cette fournaise peut être utilisée lors d'une panne de courant. Le filtre à air doit être retiré et le registre d'entrée d'air doit être laissé fermé. Voir le manuel d'instructions pour des performances optimales dans ces conditions.
- Ne pas allumer lorsque des vapeurs d'huile sont présentes.
- Voir le manuel d'instructions pour les diagrammes électriques.
- Pour de plus amples renseignements, référez-vous au manuel d'instructions.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS / DÉGAGEMENTS MINIMUM AUX MATÉRIAUX COMBUSTIBLES

Ceiling from plenum:Ceiling from conduit:	5 in	Plafond du bonnet: Plafond des conduits:	127 mm
Plenum past 6 feet:	1 in	Conduit passé 6 pieds:	25 mm
Back Wall :	16 in	Mur arrière :	406 mm
Front Wall :	48 in	Mur avant :	1220 mm
Right Side Wall :	24 in	Mur latéral droit :	610 mm
Left Side Wall :	11 in	Mur latéral gauche :	279 mm
Floor :	0 in	Plancher :	0 mm
Flue Pipe :	18 in	Tuyau à fumée :	457 mm

Made in La Guadeloupe (Qc), Canada
25/04/2017 (# test)

Fabriqué à La Guadeloupe (Qc), Canada
25/04/2017 (# test)

27657

SBI
Fabricant de poêles international
Stove Builder International

TESTING INFORMATION

Test Report 101549667MTL-001
Intertek Testing Services NA (Intertek) has conducted testing for Stove Builder International (SBI), on the Caddy Solid Fuel Wood Furnace, to evaluate all applicable performance requirements included in CSA B415.1-2010, “Performance testing of solid-fuel burning heating appliances”.

Testing was performed at client's facility under direct supervision of Claude Pelland from Intertek..

Stove Builder International Inc. model Caddy Wood Furnace has been found to be in compliance with the applicable performance requirements of the following criteria:
“CSA B415.1-2011 – Performance Testing of Solid-Fuel-Burning Heating Appliances”.

Models Heatmax II and Tundra II are considered identical as the only difference between them all is onlt aesthetic.

This standard requires that the weighted emissions rate for indoor wood fired furnaces not exceed 0.40 g/MJ and that no single run produces an emissions rate over 18 g/hr (or 0.20 g/MJ if the burn rate exceeds 8.3 dry Kg/hr).

The unit as tested produced a weighted average emission rate of 0.282 g/MJ (0.654 lbs/mmBTU) and therefore met this limit.

(See Appendices A through G for test data that are part of this report)

SIGNATURE PAGE

Reported By:

Claude Pelland, P.Eng.
Staff Engineer
Intertek Lachine

Reviewed By:

Ken Slater
Technician 1
Building Products

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Appendix B Data and Calculation forms
Appendix C Calibration
Appendix D Drawings and owner-s manual
Appendix E Dry Gas meter calibration
Appendix F 10 hours break-in period
Appendix G Stack Loss Efficiency

001- Test Report 101549667MTL-001

TEST REPORT

REPORT NUMBER: 1015495667MTL-001
REPORT DATE: May 9, 2015

EVALUATION CENTER
Intertek Testing Services NA Ltd.
1829, 32nd Avenue
Lachine, Qc.

RENDERED TO

Stove Builder International In.
250, Copenhague
St-Augustin-de-Desmaures, G3A 2H3
Canada

PRODUCT EVALUATED:

Model Caddy Solid Fuel Wood Furnace

Report of Testing Model Caddy Wood-fueled hot aired furnace for compliance with the applicable requirements of the following criteria: CAN/CSA B415.1-2010 Performance Testing of Solid-Fuel-Burning Heating Appliances.

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

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I. INTRODUCTION

Intertek Testing Services NA (Intertek) has conducted testing for Stove Builder International (SBI), on the Caddy Solid Fuel Wood Furnace, to evaluate all applicable performance requirements included in CSA B415.1-2010, “Performance testing of solid-fuel burning heating appliances”.

A. GENERAL

The test was conducted to determine if the unit is in accordance with CSA B415.1, “Performance testing of solid-fuel burning heating appliances”. This evaluation was conducted from January 27th to February 3rd, 2015.

Tests were conducted by Claude Pelland, the undersigned. The tests were conducted at the client facility in St-Augustin-de-Desmaures, Quebec located at 250 de Copenhague, St-Augustin-de-Desmaures, Quebec, G3A 2H3. The laboratory elevation is 213 feet above sea level. Tests were evaluated to CAN/CSA B415.1-2010 Performance Testing of Solid-Fuel-Burning Heating Appliances.

B. TEST UNIT DESCRIPTION

The model Caddy Solid Fuel Wood Furnace is a free standing manually fed wood furnace constructed of carbon steel with a fire chamber lined with firebrick. The outer dimensions are 27-inches wide, 48-inches high and 52-inches deep. The unit has a front door with a viewing glass and an automatically controlled blower at the back based on temperature in the duct through which it distributes heat. (See product drawings and component description in Appendix D)

There are equivalent models to the Caddy which are the Tundra, Heatmax and Sierra 140. They all share the same critical characteristics like firebox dimensions, air inlets and outlets, flue gas dimension and location, etc. (See product drawings and component description in Appendix D)

Tests were conducted using the Caddy unit as a reference representative of this furnace.

C. RESULTS

The unit as tested produced an average emissions rate of 0.282 g/MJ of delivered heat output (0.654 lbs/MMBtu Output).

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D. PRETEST INFORMATION

The test unit was prepared at client's facility in St-Augustin-de-Desmaures, Quebec, on September 22, 2014. The unit was inspected upon receipt and found to be in good condition. The unit was set up following manufacturer's instructions without difficulty. Following assembly, the unit was placed on the test stand and instrumented with thermocouples in the specified locations.

R & D testing took place from September 22nd, 2014 to January 5th, 2015. On January 6th, 2015 the chimney system and laboratory dilution tunnel was cleaned using standard wire brush chimney cleaning equipment.

Prior to beginning the emissions tests, the unit was operated for several days at high-to-medium burn rates to break in the furnace in accordance with Clause 5.2.5. The unit was found to be operating satisfactory during this break-in. On January 23rd, 2015 the unit was ready for testing.

II. SUMMARY OF TEST RESULTS

A. INFORMATION LOG

1. TEST STANDARD

From January 27 to February 3, 2015, the unit was tested for CSA B415.1-10, "Performance of solid-fuel burning heating appliances".

2. DEVIATION FROM STANDARD METHOD

Test run #2 is only partially reported because approximately 40 minutes in the test sampling train filters plugged and it was impossible to maintain proportionality rates. The test was therefore stopped at that time.

Test run #3 is considered an outlier because while it was operated as a Category IV burn-rate it did not achieve the delivered output target and was replaced by test run #4. Since test run #3 fell into a Category III burn-rate while being operated like a Category IV it did not comply with the intent of standard, it was not considered in calculations.

Also, for Category II and Category III burn-rates, 53% and 76% of maximum output were used respectively instead of the 44% and 66% as stated in the standard. It was found during R & D tests that the behavior of the unit made it so that when targeting percent of maximum output as prescribed in the standard it would end up in the category just below the one targeted. It was therefore decided to use a different target inside the same category but higher.

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The automatically controlled blower stopped from time to time during test runs. Although there was obviously some heat coming out from the plenum during that time, equipment prescribed in the standard did not allow this flow to be measured. We used a high precision instrument to measure the flow while the blower stopped and applied that flow at every reading where the blower was down. This report reflects all of these judgments.

No other deviations from the standard were performed, however, only the applicable sections of the standard were used during all testing.

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III. SUMMARY OF TEST RESULTS

Table 1 - Emission rates and Efficiency

Run No.	Test Date	Burn rate	Emission rate	Emission rate	Emission rate	Delivered Efficiency	Delivered Efficiency	Overall Efficiency	Overall Efficiency
		kg/h	g/MJ	lbs/mmBTU	g/h	% HHV	% LHV	% HHV	% LHV
1	Jan. 27th, 2015	1.04	0.178	0.413	2.36	64.7	70.5	78.6	84.9
2	Jan. 28th, 2015	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Jan. 29th, 2015	2.70	0.171	0.398	5.82	63.9	69.7	72.3	78.1
4	Jan. 30th, 2015	3.53	0.079	0.183	3.73	67.9	74.0	74.8	80.8
5	Feb. 2nd, 2015	1.75	0.435	1.010	9.19	61.2	66.7	75.3	81.4
6	Feb. 3rd, 2015	2.84	0.302	0.703	9.42	55.6	60.6	71.7	77.5

(1)As provided by CSA B415.1-10 spreadsheet in the standard.

Table 2 - Weighted average emission rate (Corr)

Run No.	Burn rate	(E_{SI}) Average Emission Rate	(E) Average Emission Rate	Probability	(K) Weighting Factor	($K*E_{SI}$)	(K*E)
	kg/h	g/MJ	lbs/mmBTU	-	-	g/MJ	lbs/mmBTU
1	1.03	0.178	0.413	0.3963	0.8495	0.151	0.351
5	1.73	0.435	1.010	0.8495	0.5837	0.254	0.590
6	2.80	0.302	0.703	0.9800	0.1402	0.042	0.099
4	3.48	0.079	0.183	0.9897	0.02	0.002	0.004
*Outlier - 3	2.67	0.171	0.398	-	-	-	-
				Totals :	1.5934	0.449	1.043
				Weighted average emission rate :		0.282	0.654

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Report No. 101549667MTL-001 Report Date: May 9th, 2015 /rev I May 16, 2017
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Client: Stove Builder International Inc. Model: Caddy Wood Furnace

Table 3 - Weighted average efficiency (% HHV) (Corr)

Run No.	Burn rate	(DE) Delivered Efficiency	(OE) Overall Efficiency	Probability	(K) Weighting Factor	(K*DE)	(K*OE)
	kg/h	% HHV	% HHV	-	-	% HHV	% HHV
1	1.03	64.7	78.6	0.40	0.8495	54.963	66.771
5	1.73	61.2	75.3	0.85	0.5837	35.722	43.953
6	2.80	55.6	71.7	0.98	0.1402	7.795	10.052
4	3.48	67.9	74.8	0.99	0.02	1.358	1.496
*Outlier - 3	2.67	63.9	72.3	-	-	-	-
Totals :					1.5934	99.838	122.272
Weighted average effiency (%) :						62.7	76.7

Table 4 - Weighted average efficiency (% LHV) (Corr)

Run No.	Burn rate	(DE) Delivered Efficiency	(OE) Overall Efficiency	Probability	(K) Weighting Factor	(K*DE)	(K*OE)
	kg/h	% LHV	% LHV	-	-	% LHV	% LHV
1	1.03	70.5	84.9	0.3963	0.8495	59.890	72.123
5	1.73	66.7	81.4	0.8495	0.5867	39.133	47.757
6	2.80	60.6	77.5	0.9800	0.1402	8.496	10.866
4	3.48	74.0	80.8	0.9897	0.0200	1.480	1.616
*Outlier - 3	2.67	69.7	78.1	-	-	-	-
Totals :					1.5964	108.999	132.361
Weighted average effiency (%) :						68.3	82.9

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Table 5 - Weighted average CO

Run No.	Burn rate (kg/h)	Total CO	CO Rate	Average CO[1]	Average CO[1]	Probability	(K) Weighting Factor	(K*CO)	(K*CO)	(K*CO rate)	Test duration
	kg/h	g	g/min	g/MJ Output	lbs/mmBTU Output	-	-	g/MJ Output	lbs/mmBTU Output	g/min	min
1	1.03	1069	1.29	4.75	11.04	0.3963	0.8495	4.04	9.38	1.09	830
5	1.73	946	2.20	5.12	11.89	0.8495	0.5837	2.99	6.94	1.28	430
6	2.80	749	2.88	4.34	10.10	0.9800	0.1402	0.61	1.42	0.40	260
4	3.48	345	1.57	1.80	4.18	0.9897	0.0200	0.04	0.08	0.03	220
*Outlier - 3	2.67	583	2.08	3.27	7.61	-	-	-	-	-	280
	Totals :						1.593	7.668	17.818	2.814	
	Weighted average efficiency (g/MJ Output) :							4.812	11.183	1.766	

[1]As provided by CSA B415.1-10 spreadsheet in the standard.

Table 6 - Pretest and test fuel load

Run No.	Pre-test load				Test load				
	Loading weight Wet Basis	Moisture content Dry Basis	Coal bed weight	Coal bed	Weight Wet Basis	Loading Density Wet Basis	Moisture content Dry Basis	Fuel nominal length	Number of pieces
	lbs	%	lbs	%	lbs	lbs/ft³	%	in.	-
1	35.1	22.9	7.49	19.1	39.16	12.05	22.89	16	6
2	36.2	23.0	8.22	23.3	35.28	10.86	23.78	16	6
3	35.0	23.5	8.51	25.1	33.95	10.45	22.14	16	6
4	33.6	22.3	8.74	25.0	34.94	10.75	22.43	16	6
5	32.7	23.2	7.42	21.9	33.95	10.45	22.77	16	6
6	33.2	23.7	7.65	22.9	33.35	10.26	23.11	16	6

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Table 7 - Heat output rates and test run categories(Corr)

Run No.	Category	Burn rate	Average Delivered Output	Average Delivered Output	% Max Output	Average Total Output	Average Total Output
		kg/h	kJ/h	BTU/h	%	kJ/h	BTU/h
1	I	1.04	13,322	12,635	28.2	16,273	15,436
3	III	2.70	34,035	32,280	72.0	38,178	36,216
4	IV	3.53	47,295	44,857	100.0	52,327	49,638
5	II	1.75	21,153	20,062	44.7	25,782	24,457
6	III	2.84	31,147	29,541	65.9	39,792	37,747

Table 8 - Dual train precision

Run No.	Sample ratios		Total emissions		Deviation(2)	Deviation
	Train 1	Train 2	Train 1	Train 2		
	-	-	g	g	%	g/kg
1	810.60	880.46	33.64	31.78	2.84	0.128
3	1731.84	1585.35	27.54	26.79	1.37	0.060
4	1568.02	1594.85	13.48	13.88	1.43	0.032
5	947.11	1099.50	64.21	67.51	2.50	0.266
6	1546.95	1556.27	40.99	40.62	0.46	0.030

(2)As described in ASTM E2515 section 11.7

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Table 9 - Flow measurements

Run No.	Burn time	Velocity	Volumetric Flow rate	Total temperature	Volume sampled		Particulate catch	
					Train 1	Train 2	Train 1	Train 2
	min	ft/s	dscf/min	R	dscf	dscf	mg	mg
1	830	6.36	133.24	537.66	136.427	125.602	41.5	36.1
3	280	6.88	144.07	591.76	23.292	25.444	15.9	16.9
4	220	6.76	141.66	606.06	19.876	19.541	8.6	8.7
5	430	6.94	145.41	553.92	66.018	56.869	67.8	61.4
6	260	6.97	145.97	576.12	24.534	24.387	26.5	26.1

Table 10 - Test facility conditions

Run No.	Room temperature start	Room temperature end	Barometric pressure start	Barometric pressure end	Air Velocity before	Air Velocity after
	°F	°F	in. Hg.	in. Hg.	ft/min	ft/min
1	66	66	30.15	29.97	0	0
2	70	N/A	30.18	N/A	0	N/A
3	72	67	30.30	29.99	0	0
4	71	71	29.83	29.83	0	0
5	65	67	30.00	29.94	0	0
6	68	67	30.09	30.12	0	0

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Table 11 - General summary

Run No.	Burn rate	Change in surface temperature	Initial Draft	Run Time	Average Draft
	kg/h	°F	"H_2O	min	"H_2O
1	1.04	79.11	0.040	830	0.021
3	2.70	97.59	0.050	280	0.040
4	3.53	48.44	0.045	220	0.049
5	1.75	34.56	0.040	430	0.031
6	2.84	54.40	0.035	260	0.038

IV. PROCESS DESCRIPTION

A. AIR SUPPLY SYSTEM

Combustion air enters at the front of the firebox through an opening at the top of the firebox. This air is normally controlled thermostatically. In order to simulate thermostat heat demand, a toggle switch was installed in replacement of this thermostat and was switched on and off to meet target heat output of each category.

B. DISCUSSION

RUN #1 (January 27th, 2015). Toggle switch(primary air) was set on for the first 5 min 25 sec at which time it was turned off for the remainder of the test. Convection blower was allowed to operate automatically as intended. The test load weighed 39.16 lbs and was loaded with a coal bed of 7.49 lbs. The average delivered output was 13,322 kJ/h (12,635 BTU/h). Burn time was 830 minutes. The burn rate was 1.04 kg/hr. The particulate emissions were 0.178 g/MJ (0.413 lbs/mmBTU).

RUN #2 (January 28th, 2015). Toggle switch(primary air) was set on for the duration of the test. Convection blower was allowed to operate automatically as intended. The test load weighed 35.28 lbs and was loaded with a coal bed of 8.22 lbs. After 40 minutes of sampling, it became impossible to keep up the sampling rate and ratio. At this point, all equipments were turned off and test run was stopped and run considered invalid.

RUN #3 (January 29th, 2015). Toggle switch was set on for the full duration of the test. Convection blower was allowed to operate automatically as intended. The test load weighed 33.95 lbs and was loaded with a coal bed of 8.51 lbs. The average

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delivered output was 34,035 kJ/h (32,280 BTU/h). Burn time was 280 minutes. The burn rate was 2.67 kg/hr. The particulate emissions were 0.171 g/MJ (0.398 lbs/mmBTU).

RUN #4 (January 30th, 2015). Toggle switch(primary air) was set on for the full duration of the test. Convection blower was allowed to operate automatically as intended. The test load weighed 34.94 lbs and was loaded with a coal bed of 8.74 lbs. The average delivered output was 47,295 kJ/h (44,857 BTU/h). Burn time was 220 minutes. The burn rate was 3.53 kg/hr. The particulate emissions were 0.079 g/MJ (0.183 lbs/mmBTU).

RUN #5 (February 2nd, 2015). Toggle switch(primary air) was set on for the first 5 min 25 sec. Delivered heat output rate was evaluated every minute and the toggle switch was turned off when heat output rate exceeded 53% of maximum output and turned on when dropped below that target. Convection blower was allowed to operate automatically as intended. The test load weighed 33.95 lbs and was loaded with a coal bed of 7.42 lbs. The average delivered output was 21,153 kJ/h (20,062 BTU/h). Burn time was 430 minutes. The burn rate was 1.73 kg/hr. The particulate emissions were 0.435 g/MJ (1.010 lbs/mmBTU).

RUN #6 (February 3rd, 2015). Toggle switch(primary air) was set on for the first 5 min 25 sec. Delivered heat output rate was evaluated every minute and the toggle switch was turned off when heat output rate exceeded 76% of maximum output and turned on when dropped below that target. Convection blower was allowed to operate automatically as intended. The test load weighed 33.35 lbs and was loaded with a coal bed of 7.65 lbs. The average delivered output was 31,147 kJ/h (29,541 BTU/h). Burn time was 260 minutes. The burn rate was 2.84 kg/hr. The particulate emissions were 0.302 g/MJ (0.703 lbs/mmBTU).

C. OPERATION DURING TEST

The convection air outlet plenum was adjusted to keep 0.2" H_2O per manufacturer's instructions at blower speed 2 out of 4. As stated above, the convection blower was allowed to operate automatically as intended. The inlet and outlet air temperatures on the furnace were monitored to determine the Delta-T and ultimately the delivered output.

D. TEST FUEL PROPERTIES

The fuel used was a mix of Maple (Sugar), beech and birch. The fuel was split cordwood of nominal length of16 inches. The fuel was dried in air to an average moisture content between 18% and 28% on a dry basis. Cordwood fuel was loaded from front to back into the firebox.

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E. START-UP OPERATION

Each test was started with a clean firebox and the scale zeroed. A fire was started using newspaper sheets and kindling made of cordwood. During the pretest loads, the primary air control was adjusted to target the same heat output rate as in the test. When the coal bed reached 10-25% of the fuel load, coals were raked and evenly spread at the bottom of the firebox just before loading.

V. SAMPLING SYSTEMS

The sampling procedure used was as specified in CAN/CSA B415.1-2010 and ASTM E2515-2011.

A. SAMPLING LOCATIONS

Particulate samples are collected from the dilution tunnel at a point 20 feet from the tunnel entrance. The tunnel has two elbows ahead of the sampling section. (See Figure 1) The sampling section is a continuous 15-foot section of 8-inches diameter pipe straight over its entire length. Tunnel velocity pressure is determined by a standard Pitot tube located 100 inches from the beginning of the sampling section. The dry bulb thermocouple is located six inches downstream from the Pitot tube. Tunnel samplers are located 48 inches downstream of the Pitot tube and 32 inches upstream from the end of this section. (See Figure 1.)

Stack gas samples are collected from the steel chimney section 8 feet ± 6 inches above the scale platform. (See Figure 2.)

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B. DILUTION TUNNEL

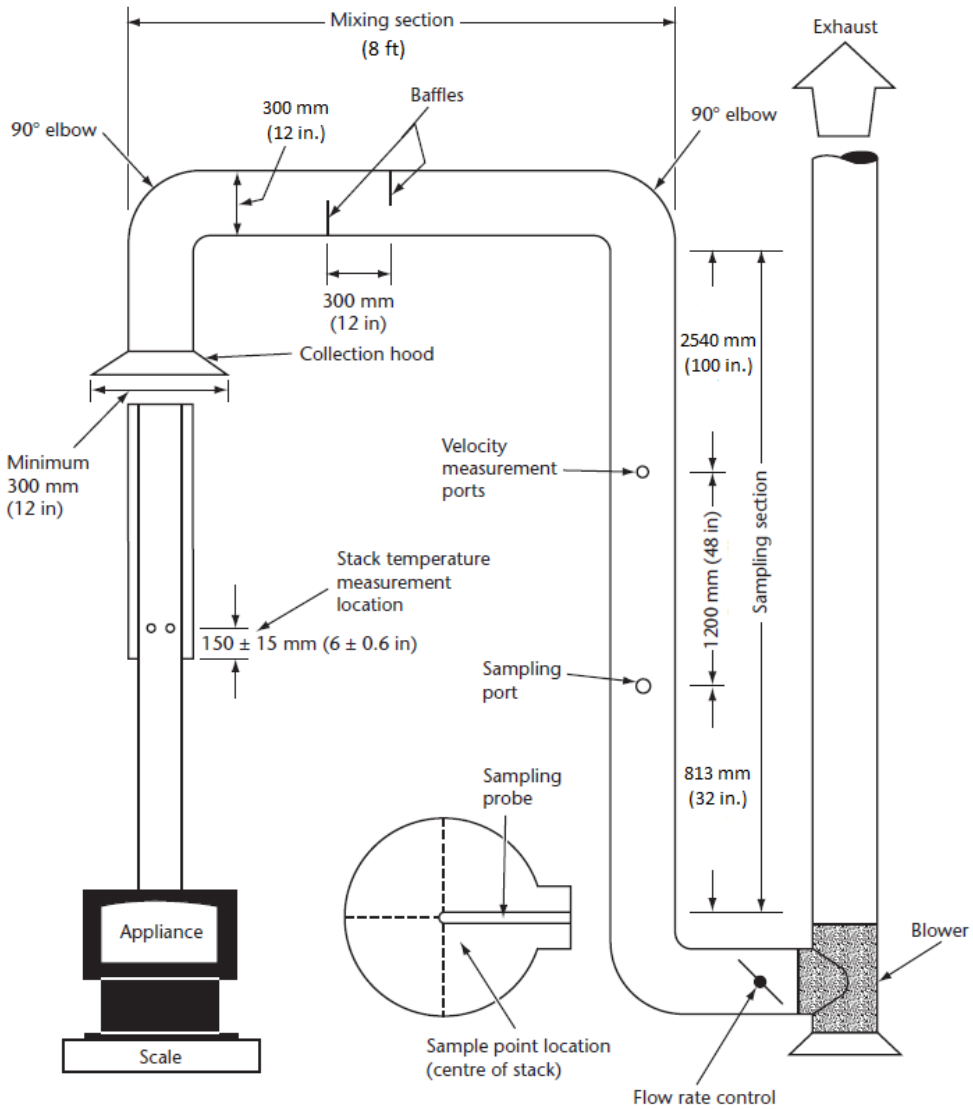

Figure 1- Dilution tunnel

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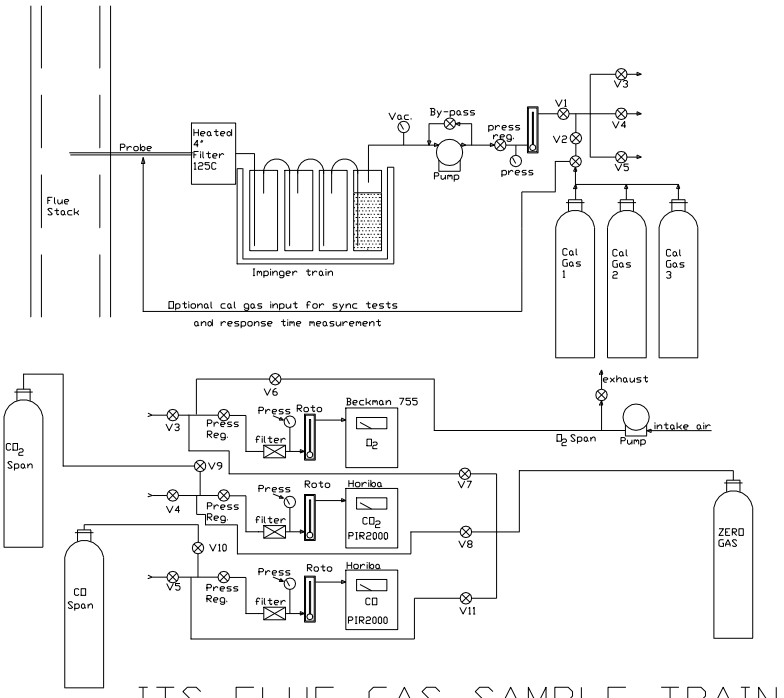
C. STACK GAS SAMPLE TRAIN



ITS FLUE GAS SAMPLE TRAIN

FIGURE 2

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D. DILUTION TUNNEL SAMPLE SYSTEMS

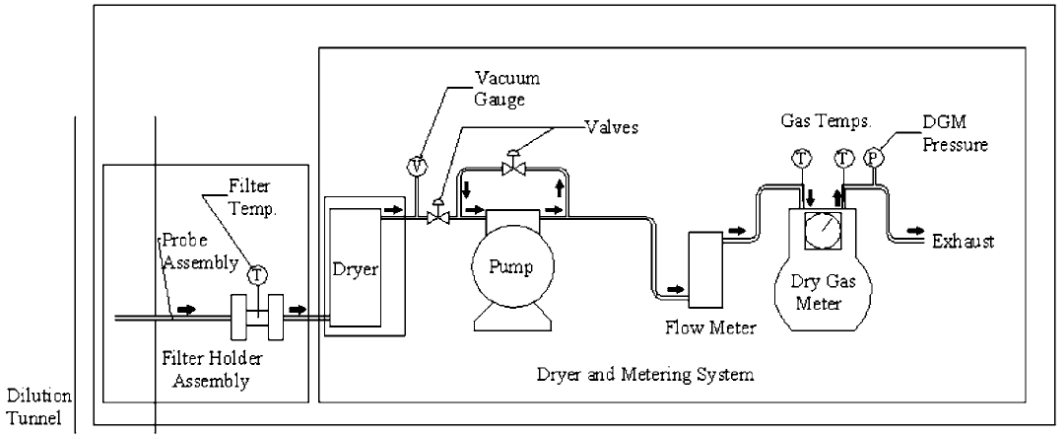

Figure 2 - Sampling trains

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VI. SAMPLING METHODS

A. PARTICULATE SAMPLING

Particulates were sampled in strict accordance with ASTM E2515-11. This method uses two identical sampling systems with Gelman A/E 61631 binder free, 47-mm diameter filters. The dryers used in the sample systems are filled with "Drierite" before each test run.

VII. QUALITY ASSURANCE

A. INSTRUMENT CALIBRATION

1. DRY GAS METERS

At the conclusion of each test program the dry gas meters are checked against a standard dry gas meter. Three runs are made on each dry gas meter used during the test program. The average calibration factors obtained are then compared with the six-month calibration factor and, if within 5%, the six-month factor is used to calculate standard volumes. Results of this calibration are contained in Appendix C.

An integral part of the post test calibration procedure is a leak check of the pressure side by plugging the system exhaust and pressurizing the system to 10" W.C. The system is judged to be leak free if it retains the pressure for at least 10 minutes.

The standard dry gas meter is calibrated every 12 months using a Spirometer designed by the EPA Emissions Measurement Branch. The process involves sampling the train operation for 1 cubic foot of volume. With readings made to .001 ft3, the resolution is .1%, giving an accuracy higher than the ±2% required by the standard.

2. STACK SAMPLE ROTOMETER

The stack sample rotameter is checked by running three tests at each flow rate used during the test program. The flow rate is checked by running the rotometer in series with one of the dry gas meters for 10 minutes with the rotometer at a constant setting. The dry gas meter volume measured is then corrected to standard temperature and pressure conditions. The flow rate determined is then used to calculate actual sampled volumes.

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3. GAS ANALYZERS

The continuous analyzers are zeroed and spanned before each test with appropriate gases. A mid-scale multi-component calibration gas is then analyzed. At the conclusion of a test, the instruments are checked again with zero, span and calibration gases. The drift in each meter is then calculated and must not exceed 5% of the scale used for the test.

At the conclusion of each unit test program, a five-point calibration check is made. This calibration check must meet accuracy requirements of the applicable standards. Consistent deviations between analyzer readings and calibration gas concentrations are used to correct data before computer processing. Data is also corrected for interferences as prescribed by the instrument manufacturer's instructions.

B. TEST METHOD PROCEDURES

1. LEAK CHECK PROCEDURES

Before and after each test, each sample train is tested for leaks. Leakage rates are measured and must not exceed 0.02 CFM or 4% of the sampling rate. Leak checks are performed checking the entire sampling train, not just the dry gas meters. Pre-test and post-test leak checks are conducted with a vacuum of 5 inches of mercury. Vacuum is monitored during each test and the highest vacuum reached is then used for the post test vacuum value. If leakage limits are not met, the test run is rejected. During these tests no vacuum were observed. Thus, leakage rates reported are expected to be much higher than actual leakage during the tests.

2. TUNNEL VELOCITY/FLOW MEASUREMENT

The tunnel velocity is calculated from a center point Pitot tube signal multiplied by an adjustment factor. This factor is determined by a traverse of the tunnel as prescribed in EPA Method 1. Final tunnel velocities and flow rates are calculated from EPA Method 2, Equation 6.9 and 6.10. (Tunnel cross sectional area is the average from both lines of traverse.)

Pitot tubes are cleaned before each test and leak checks are conducted after each test.

3. **PM SAMPLING PROPORTIONALITY (ASTM E2515-11)**

Proportionality was calculated in accordance with ASTM E2515-11. The data and results are included in Appendix B.

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VIII. RESULTS AND OBSERVATIONS

Stove Builder International Inc. model Caddy Wood Furnace has been found to be in compliance with the applicable performance requirements of the following criteria:

"**CSA B415.1-2011 – Performance Testing of Solid-Fuel-Burning Heating Appliances**".

This standard requires that the weighted emissions rate for indoor wood fired furnaces not exceed 0.40 g/MJ and that no single run produces an emissions rate over 18 g/hr (or 0.20 g/MJ if the burn rate exceeds 8.3 dry Kg/hr). The unit as tested produced a weighted average emission rate of 0.282 g/MJ (0.654 lbs/mmBTU) and therefore met this limit.

INTERTEK TESTING SERVICES NA

Reported by: _____
Claude Pelland, Eng.
Test Engineer

Reviewed by: _____
Rick Curkeet P.E.
Chief Engineer- Hearth Products

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REVISION SUMMARY

DATE	SUMMARY
August 10, 2015	Modification of Tables2, 3, 4, 7 and appendix B To correct Fan Off BTU output
May 16, 2017	Revision of table 5 (P 9) to add CO emissions in g/min.

Appendix A Laboratory operating procedure

APPENDIX A
Laboratory Operating Procedure

Appendix A Laboratory operating procedure (page 2 of 7)

Report Number: G102038216 Issued date: April 29, 2015
Client: Stove Builder International inc.

A. GAS ANALYSIS

1. Instruments should be turned on and allowed to warm up for one (1) hour minimum.

2. Calibrate analyzers as follows:

NOTE : Prior to proceeding with calibration, make sure to use NIST tracable calibration gas bottles. Adjust flow meter if necessary at each instrument to required flow value.

a) Using span gas, adjust span control to values specified on calibration gas label.
b) Using nitrogene, adjust zero controls to provide a 0.00 analyzer readout.

c) Repeat a) and b) until no further adjustment is required.
d) Check readout vs. calibration gases (2) labels.

The CO_2 and CO analyzers are "ZEROED" on nitrogen. The O_2 analyzer is spanned on air and set for 20.9%. It is zeroed on nitrogen as well.

3. Check for response time synchronization.

a) With no fire in unit, allow reading to stabilize (O_2 should be 20.93, CO and CO_2 should equal O).
b) Flow the calibration gas in the unit and start stop watch. Note the time required for each unit to reach .90 of the calibration gas bottle value. If all three analyzers reach this value within 15 seconds of each other, synchronization is adequate. If not, contact the laboratory manager. Synchronization is adjusted by internal instrument setting.

4. Set-up sample clean-up and water collection train as follows.

a) Load impingers as follows:
Impinger #1: 100 ml distilled water and 5 ml H_2SO_4
Impinger #2: 100 ml distilled water and 5 ml H_2SO_4
Impinger #3: Empty
Impinger #4: 200 – 300 grams silica gel (dry)

Appendix A Laboratory operating procedure (page 3 of 7)

Report Number: G102038216 Issued date: April 29, 2015
Client: Stove Builder International inc.

b) Place impingers in container and connect with “U TUBES”. Grease carefully on bottom half of ball joint so that grease will not get into tubes.
c) Connect filter to first impinger and sample line to last impinger.

e. Leak check system as follows.

1) Plug probe.
2) Turn on sample system.
3) Observe sample flow rotometer and vacuum gauge. If necessary, use vacuum; adjust valve to set vacuum to the maximum inches Hg.
4) If the float in rotometer does not stabilize below 10 on scale, system must be resealed.
5) Repeat leak check procedure until satisfactory results are obtained.

f) Just prior to starting test, fill impinger container with water and ice and record ambiant conditions on data form no. 192-t-9904.

B. Dilution tunnel sample train set-up

1. Filters and holders.

a) Clean probes and filter holder front housings carefully and desiccate for at least 24 hours prior to use.
b) Filters should be numbered and filter and probe combinations labeled prior to use.
c) Weigh desiccated filters and probe-filter units on analytical balance. Record weights data form no. 192-p-9904. Note that probe and front half of front filter are to be weighed as a unit.
d) Carefully assemble filter holder units and connect to sampling systems. Check “DRIERITE” columns for adequate dry absorbent (blue).

2. Leak checking.

a) Each sample system is to be checked for leakage prior to inserting probes in tunnel.

Appendix A Laboratory operating procedure (page 4 of 7)

Report Number: G102038216 Issued date: April 29, 2015
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b) Plug probes and start samplers, adjust pump bypass valve to produce a vacuum reading of 5 inches Hg. (NOTE: During test, vacuum must not exceed 5 inches unless posttest leak check shows acceptable results.)

c) Allow vacuum indication to stabilize for two (2) minutes, then record time and dry gas (DGM_1) and (DGM_2) meter readings. Wait ten (10) minutes and record dry gas meter readings again (DGM_3, DGM_4). NOTE: If mark, system is leaking too much and all seals should be checked.

d) Calculate leakage rate as follows.

1) System 1: $\frac{(DGM_3 - DGM_1)}{10} = CFM_1$

2) System 2: $\frac{(DGM_4 - DGM_2)}{10} = CFM_2$

If CFM_1 or CFM_2 is greater than .02 CFM, leakage is unacceptable and system must be resealed.

If CFM_1 or CFM_2 is greater than 0.04 X sample rate, leakage is unacceptable. For most tests, the sample rate will be about 0.15 CFM, thus leakage rates in excess of 0.04 X 0.15 = 0.006 CFM are not acceptable.

e) Once leakage check is satisfactory, unplug probe and set flow to appropriate rate for test. This should be done in the minimum amount of time necessary and with the probes in ambient air. Do not insert probes in tunnel until the start of the test run. When flow is established, replug probes to prevent contamination.

Appendix A Laboratory operating procedure (page 5 of 7)

Report Number: G102038216 Issued date: April 29, 2015
Client: Stove Builder International inc.

TEST CONDUCT

A. FUEL LOAD

1. Determine optimum load weight by multiplying firebox volume in cubic feet by 7. This is the load weight on an as-fired basis.
2. Determine piece size to obtain the requested load configuration and meet the test load weight criteria. The load should consist of the following: **TO BE DETERMINED**
3. Weigh out test load and adjust weight by shortening all pieces equally if necessary.
4. Measure and record moisture content of each fuel piece using Delmhorst moisture meter. Determine if fuel load moisture content is in required range. If not, construct new load using wood with required moisture content. All wood in the humidity chamber should be within range. Contact project manager if you cannot find suitable pieces.

B. Unit start-up

1. Before lighting a fire, turn on dilution tunnel and set flow rate to 140 SCFM if burn rate is to be less than 3 kg/hr or to an appropriate rate from table provided in laboratory for higher burn rates. Record readings on data form no. 192-r-9904.
2. Check draft imposed on cold stove with all inlets closed and a draft gauge in the chimney. If draft is greater than 0.005 inches water column, adjust tunnel to stack gap until draft is less than 0.005.
3. Check for ambient airflow around unit with hot wire anomometer. Must be less than 50 ft/min.
4. Check all equipment for proper operation. Analyzers should be on and in sample mode. Computer should be loaded with test program and awaiting test start command.
5. Zero scale and start fire with uncolored newspaper and kindling representing 10 % of test load with the same type of fuel.
6. Once kindling is burning well after 5 minutes, add splitted pieces having a bottom surface around 4 sq. inches and representing 25% of test load weight. Operate at high fire for 15 minutes. Then adjust settings to intended test run levels as per the manufacturer's.
7. Following addition of pretest fuel load (splitted pieces), start computer for data logging.

Appendix A Laboratory operating procedure (page 6 of 7)

Report Number: G102038216 Issued date: April 29, 2015
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C. Test run

1. When the 15 minutes high fire pre-burn period is completed, the test is to be started as follows:

   a) Insert the sample probes into the tunnel being careful not to hit sides of tunnel with probe tip.
   b) Check tunnel pitot tube for proper position. (Pitot should be carefully cleaned prior to each test.)
   c) Turn on probe sample systems and stack sampler.
   d) Open stove door, rake coals and load stove as follows: **TO BE DETERMINED**
   e) Close door or follow manufacturer's start-up procedures. (Five (5) minutes maximum time before all doors and controls must be set to final positions for duration of test.)
   f) An alarm will sound an audible signal at the (10) minutes intervals. This signal a reading interval. You must record at each interval the following readings on data form no. 192-v-9904:

      1) Rotometer readings.
      2) Tunnel pitot tube reading.
      (Zero regularly between readings)
      3) Dry gas meter readings.
      4) Temperature readings.
      5) Draft reading
      6) Test laod weight
      7) CO, CO_2 and O_2 readings
      8) Observations of any unusual or non-routine events.

   g) During the test, any condition approaching unacceptable limits will be noted. The filter probes and housings are installed in small holders just outside the tunnel. If the filter temperature gets too high, you will have to increase the water flow through the cooling unit until acceptable temperatures are obtained. In between readings, check on other equipment. Be sure dryers and filters are working and monitor impinger train for proper water and ice levels etc.

Appendix A Laboratory operating procedure (page 7 of 7)

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h) When the fuel charge is consumed, it will signal end of test and shut down the sampling systems. When this occurs, remove filter holder and probes from tunnel and impingers from sample line.

III. POST TEST PROCEDURES

SAMPLE RECOVERY – FILTER TRAINS

1. Carefully clean outside of probes and filter housings with alcohol.
2. Disassemble filter holder and transfer filters to clean petri dish. Scrape gasket with scalpel and collect any loose material on filters.
3. Place probe and front half of first filter holders (still assembled) and filters in desiccator. Allow 24-hour desiccation before weighing.
4. Weigh probe filter holder units and filters at two (2) hour intervals until weight change between weighings is less than 0.5 mg. Record all weights taken on data form no. 192-p-9904.

Calculation of results

The computer program carries out all final calculations. When run, it will ask for data from forms used during the test. Enter data as called for.

Other tests

Fuel samples for each run should be tested for heating value and moisture content by ASTM D3286 and D4442 methods respectively.

GENERAL

This guide cannot cover every possible contingency, which may develop during a particular test program. Many questions, which may arise, can be answered by a complete understanding of the test standards and their intent. When in doubt on any detail, check with the laboratory manager and be sure you understand the procedures involved.

It is critical that all spaces on the data forms be properly filled in. Each test must be represented by a complete record of what was done and when.

Appendix B Data and Calculation forms

APPENDIX B

Data and calculation forms

Appendix B Data and Calculation forms (page 2 of 136)

Blower off-cycle cfm

Duct Traverse with Hot wire anemometer

	V (Ft/min)
1	106

Average 106 ft/min
CFM 0.97764757 0.92217478 scfm

Duct Ht.	1.25	Inch	31.75 mm
Duct Width	2.125	Inch	53.975 mm
Area	1.328125	sq. in.	0.00085685 Sq. Meters
Equiv Diam	0.79	in	

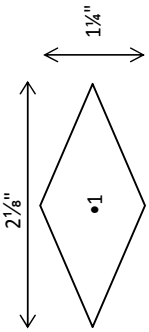
Baro:	30.27	in Hg
Duct S.P.	0.2	in H2O
Temp.	98	F
Temp.	36.67	C
Pitot Fact	0.99	

30.28 Duct Absolute P

0.538 m/sec
0.0004614 m³/sec

0.00043522 standard m³/sec

Duct outlet shape



Appendix B Data and Calculation forms (page 3 of 136)

E&E FUEL PRELOAD DATA SHEET

Manufacturer: SBI
Model: Caddy
Run #: 1
Test Date: 1/27/2015

Control# 0
Tech: 0

Test Load Weight:

			Lower	Ideal	Upper
Firebox Volume:	3.25	cu. ft	29.25	32.50	35.75
Load Volume:	0.0000	cu. ft			

Loading Density: 10.812 lbs./ft3

Number of Spaces: 0
Spacer weight: 0

Load Density (wet): #DIV/0! lbs./ft3
Dry Wood Density: #DIV/0!

	Red Oak	White Oak
Species	X	

Piece Size: Thick x Wide x Length	Weight lbs	Meter Moisture Content Dry Uncorrected %			Ave. MC x Weight	Volume Cubic Inches
	5.65	27.50	18.30	19.60	123.17	0.00
	6.38	20.00	20.00	21.30	130.3646667	0.00
	5.66	27.80	20.70	27.50	143.3866667	0.00
	7.24	27.30	24.20	23.30	180.5173333	0.00
	5.18	27.30	18.30	26.10	123.802	0.00
	5.03	25.40	19.30	19.00	106.8036667	0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
				SUM MCxWT	808.0443333	16
						18
						20
						22
						24
						26
						28
						30
						32
						34

Test Load Weight: 35.14 lbs.

Dry Weight: 12.72 kg.

Average Moisture Content: %

Dry: 23.00

25.27
Must be 18-28

Wet: 20.17
must be 15-25

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsPreload Data

Appendix B Data and Calculation forms (page 4 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
0.00	39.2	44.5	17.4	0.0000	0.000	0.000	0.000	
1.00	38.9	34.4	17.3	0.4445	0.667	2.867	0.412	
2.00	39.0	37.0	17.4	0.4445	0.667	2.879	0.414	
3.00	38.3	44.8	17.3	0.0000	0.000	0.000	0.000	
4.00	37.9	38.3	17.1	0.0000	0.000	0.000	0.000	
5.00	37.9	37.7	17.4	0.5080	0.713	3.081	0.443	
6.00	37.9	36.2	16.9	0.5080	0.713	3.074	0.442	
7.00	37.9	34.8	17.3	0.4445	0.667	2.869	0.412	
8.00	37.9	33.7	17.2	0.4445	0.667	2.864	0.412	
9.00	37.9	32.8	17.8	0.4445	0.667	2.860	0.411	
10.00	37.8	36.6	17.3	0.5080	0.713	3.076	0.442	
11.00	37.4	42.0	17.1	0.0000	0.000	0.000	0.000	
12.00	36.9	40.1	16.7	0.0000	0.000	0.000	0.000	
13.00	37.0	33.6	17.0	0.4445	0.667	2.863	0.412	
14.00	37.1	32.6	17.1	0.4445	0.667	2.859	0.411	
15.00	36.9	39.8	17.0	0.5080	0.713	3.092	0.444	
16.00	36.4	43.9	16.8	0.0000	0.000	0.000	0.000	
17.00	36.4	34.4	16.7	0.0000	0.000	0.000	0.000	
18.00	36.5	33.4	17.1	0.4445	0.667	2.862	0.411	
19.00	36.5	32.5	17.0	0.5080	0.713	3.056	0.439	
20.00	36.4	37.7	17.3	0.5080	0.713	3.081	0.443	
21.00	35.9	42.7	16.9	0.0000	0.000	0.000	0.000	
22.00	35.7	35.1	16.9	0.0000	0.000	0.000	0.000	
23.00	35.9	33.1	17.0	0.4445	0.667	2.861	0.411	
24.00	36.1	32.2	17.2	0.5080	0.713	3.054	0.439	
25.00	35.7	39.8	16.9	0.0000	0.000	0.000	0.000	
26.00	35.3	43.0	16.7	0.0000	0.000	0.000	0.000	
27.00	35.2	34.2	16.7	0.0000	0.000	0.000	0.000	
28.00	35.3	32.5	17.1	0.4445	0.667	2.858	0.411	
29.00	35.3	38.2	16.9	0.5080	0.713	3.084	0.443	
30.00	34.8	43.1	16.7	0.0000	0.000	0.000	0.000	
31.00	34.6	35.9	16.8	0.0000	0.000	0.000	0.000	
32.00	34.7	34.2	17.0	0.5080	0.713	3.064	0.440	
33.00	34.7	33.4	16.8	0.5080	0.713	3.060	0.440	
34.00	34.6	33.0	17.2	0.5080	0.713	3.058	0.440	
35.00	34.4	32.9	17.0	0.5080	0.713	3.058	0.439	
36.00	34.3	32.9	17.3	0.5080	0.713	3.058	0.439	
37.00	34.2	32.9	17.1	0.5080	0.713	3.058	0.439	
38.00	34.0	32.8	16.9	0.5080	0.713	3.057	0.439	
39.00	33.9	32.7	17.3	0.5080	0.713	3.057	0.439	
40.00	33.7	32.7	17.1	0.5080	0.713	3.057	0.439	
41.00	33.6	32.9	17.2	0.5080	0.713	3.058	0.439	
42.00	33.4	32.9	17.1	0.5080	0.713	3.058	0.439	
43.00	33.2	33.2	17.8	0.5080	0.713	3.059	0.440	
44.00	33.0	33.2	17.4	0.5080	0.713	3.059	0.440	
45.00	32.9	33.1	17.5	0.5080	0.713	3.059	0.440	
46.00	32.7	33.1	17.1	0.5080	0.713	3.059	0.440	
47.00	32.5	33.2	17.3	0.5080	0.713	3.059	0.440	
48.00	32.4	33.3	17.3	0.5080	0.713	3.060	0.440	
49.00	32.2	33.0	16.9	0.5080	0.713	3.058	0.439	
50.00	32.1	33.1	17.0	0.5080	0.713	3.058	0.440	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 5 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
51.00	31.9	33.1	17.3	0.5080	0.713	3.058	0.440	
52.00	31.7	32.9	17.1	0.5080	0.713	3.058	0.439	
53.00	31.6	32.8	16.9	0.5080	0.713	3.057	0.439	
54.00	31.4	32.6	16.9	0.5080	0.713	3.056	0.439	
55.00	31.3	32.5	17.4	0.5080	0.713	3.056	0.439	
56.00	31.1	32.5	17.3	0.5080	0.713	3.056	0.439	
57.00	31.0	32.4	17.3	0.5080	0.713	3.055	0.439	
58.00	30.8	32.2	17.3	0.5080	0.713	3.054	0.439	
59.00	30.7	32.1	17.0	0.5080	0.713	3.054	0.439	
60.00	30.6	32.0	17.3	0.5080	0.713	3.053	0.439	
61.00	30.5	32.0	17.2	0.5080	0.713	3.053	0.439	
62.00	30.3	31.8	17.3	0.5080	0.713	3.052	0.439	
63.00	30.2	31.8	17.3	0.5080	0.713	3.052	0.439	
64.00	30.0	31.7	17.3	0.5080	0.713	3.052	0.439	
65.00	29.8	31.7	17.4	0.5080	0.713	3.052	0.439	
66.00	29.7	31.7	17.2	0.5080	0.713	3.051	0.439	
67.00	29.5	31.7	17.1	0.5080	0.713	3.052	0.439	
68.00	29.4	31.6	17.2	0.5080	0.713	3.051	0.438	
69.00	29.3	31.7	17.3	0.5080	0.713	3.052	0.439	
70.00	29.1	31.8	17.2	0.5080	0.713	3.052	0.439	
71.00	28.9	31.8	17.1	0.5080	0.713	3.052	0.439	
72.00	28.8	31.8	17.2	0.5080	0.713	3.052	0.439	
73.00	28.6	31.9	17.3	0.5080	0.713	3.053	0.439	
74.00	28.4	32.0	17.3	0.5080	0.713	3.053	0.439	
75.00	28.3	32.0	17.1	0.5080	0.713	3.053	0.439	
76.00	28.1	32.1	17.1	0.5080	0.713	3.054	0.439	
77.00	28.0	32.2	17.3	0.5080	0.713	3.054	0.439	
78.00	27.8	32.2	17.2	0.5080	0.713	3.054	0.439	
79.00	27.6	32.3	17.3	0.5080	0.713	3.055	0.439	
80.00	27.5	32.3	17.2	0.5080	0.713	3.055	0.439	
81.00	27.3	32.5	17.1	0.5080	0.713	3.055	0.439	
82.00	27.2	32.6	17.5	0.5080	0.713	3.056	0.439	
83.00	27.0	32.7	17.5	0.5080	0.713	3.057	0.439	
84.00	26.9	32.7	17.4	0.5080	0.713	3.057	0.439	
85.00	26.7	32.8	17.3	0.5080	0.713	3.057	0.439	
86.00	26.6	32.8	17.3	0.5080	0.713	3.057	0.439	
87.00	26.4	32.8	17.3	0.5080	0.713	3.057	0.439	
88.00	26.3	33.0	17.7	0.5080	0.713	3.058	0.439	
89.00	26.1	32.8	17.3	0.5080	0.713	3.057	0.439	
90.00	26.0	32.8	17.5	0.5080	0.713	3.057	0.439	
91.00	25.8	32.8	17.4	0.5080	0.713	3.057	0.439	
92.00	25.7	32.7	17.6	0.5080	0.713	3.057	0.439	
93.00	25.5	32.6	17.5	0.5080	0.713	3.056	0.439	
94.00	25.4	32.5	17.5	0.5080	0.713	3.056	0.439	
95.00	25.3	32.3	17.5	0.5080	0.713	3.055	0.439	
96.00	25.1	32.4	17.7	0.5080	0.713	3.055	0.439	
97.00	25.0	32.1	17.3	0.5080	0.713	3.054	0.439	
98.00	24.8	32.1	17.5	0.5080	0.713	3.054	0.439	
99.00	24.7	32.1	17.7	0.5080	0.713	3.054	0.439	
100.00	24.6	32.0	17.4	0.5080	0.713	3.053	0.439	
101.00	24.5	31.9	17.6	0.5080	0.713	3.053	0.439	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 6 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
102.00	24.3	31.7	17.4	0.5080	0.713	3.052	0.439	
103.00	24.2	31.7	17.4	0.5080	0.713	3.052	0.439	
104.00	24.0	31.5	17.4	0.5080	0.713	3.051	0.438	
105.00	23.9	31.6	17.4	0.5080	0.713	3.051	0.438	
106.00	23.8	31.5	17.4	0.5080	0.713	3.051	0.438	
107.00	23.6	31.5	17.4	0.5080	0.713	3.051	0.438	
108.00	23.5	31.5	17.3	0.5080	0.713	3.050	0.438	
109.00	23.4	31.4	17.4	0.5080	0.713	3.050	0.438	
110.00	23.2	31.5	17.6	0.5080	0.713	3.050	0.438	
111.00	23.1	31.4	17.3	0.5080	0.713	3.050	0.438	
112.00	23.0	31.3	17.4	0.5080	0.713	3.050	0.438	
113.00	22.8	31.3	17.3	0.5080	0.713	3.050	0.438	
114.00	22.7	31.4	17.4	0.5080	0.713	3.050	0.438	
115.00	22.6	31.3	17.3	0.5080	0.713	3.050	0.438	
116.00	22.4	31.4	17.6	0.5080	0.713	3.050	0.438	
117.00	22.3	31.3	17.4	0.5080	0.713	3.050	0.438	
118.00	22.2	31.5	17.7	0.5080	0.713	3.050	0.438	
119.00	22.1	31.4	17.4	0.5080	0.713	3.050	0.438	
120.00	21.9	31.4	17.4	0.5080	0.713	3.050	0.438	
121.00	21.8	31.5	17.6	0.5080	0.713	3.051	0.438	
122.00	21.7	31.6	17.9	0.5080	0.713	3.051	0.438	
123.00	21.6	31.5	17.5	0.5080	0.713	3.050	0.438	
124.00	21.4	31.6	17.4	0.5080	0.713	3.051	0.438	
125.00	21.3	31.6	17.5	0.5080	0.713	3.051	0.438	
126.00	21.2	31.5	17.4	0.5080	0.713	3.051	0.438	
127.00	21.0	31.5	17.7	0.5080	0.713	3.051	0.438	
128.00	20.9	31.6	17.4	0.5080	0.713	3.051	0.438	
129.00	20.8	31.8	17.7	0.5080	0.713	3.052	0.439	
130.00	20.7	31.8	17.4	0.5080	0.713	3.052	0.439	
131.00	20.5	31.9	17.6	0.5080	0.713	3.053	0.439	
132.00	20.4	32.0	17.5	0.5080	0.713	3.053	0.439	
133.00	20.3	32.1	17.7	0.5080	0.713	3.054	0.439	
134.00	20.2	32.1	17.4	0.5080	0.713	3.054	0.439	
135.00	20.0	32.4	17.5	0.5080	0.713	3.055	0.439	
136.00	19.9	32.4	17.7	0.5080	0.713	3.055	0.439	
137.00	19.8	32.5	17.9	0.5080	0.713	3.056	0.439	
138.00	19.7	32.6	17.6	0.5080	0.713	3.056	0.439	
139.00	19.5	32.7	17.5	0.5080	0.713	3.057	0.439	
140.00	19.4	32.8	18.0	0.5080	0.713	3.057	0.439	
141.00	19.3	32.8	17.5	0.5080	0.713	3.057	0.439	
142.00	19.2	32.8	17.5	0.5080	0.713	3.057	0.439	
143.00	19.0	32.6	17.4	0.5080	0.713	3.056	0.439	
144.00	18.9	32.7	17.6	0.5080	0.713	3.056	0.439	
145.00	18.8	32.5	17.4	0.5080	0.713	3.056	0.439	
146.00	18.7	32.5	17.6	0.5080	0.713	3.056	0.439	
147.00	18.6	32.4	17.5	0.5080	0.713	3.055	0.439	
148.00	18.5	32.4	17.9	0.5080	0.713	3.055	0.439	
149.00	18.4	32.3	17.5	0.5080	0.713	3.054	0.439	
150.00	18.3	32.2	17.8	0.5080	0.713	3.054	0.439	
151.00	18.1	32.2	17.8	0.5080	0.713	3.054	0.439	
152.00	18.0	32.1	17.6	0.5080	0.713	3.054	0.439	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 7 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
153.00	17.9	32.1	18.1	0.5080	0.713	3.054	0.439	
154.00	17.8	32.0	18.0	0.5080	0.713	3.053	0.439	
155.00	17.7	32.0	17.8	0.5080	0.713	3.053	0.439	
156.00	17.6	32.0	17.8	0.5080	0.713	3.053	0.439	
157.00	17.5	31.9	17.6	0.5080	0.713	3.053	0.439	
158.00	17.4	31.8	17.5	0.5080	0.713	3.052	0.439	
159.00	17.3	31.9	17.7	0.5080	0.713	3.053	0.439	
160.00	17.2	31.8	17.6	0.5080	0.713	3.052	0.439	
161.00	17.1	31.8	17.5	0.5080	0.713	3.052	0.439	
162.00	17.0	31.8	17.9	0.5080	0.713	3.052	0.439	
163.00	16.9	32.0	18.1	0.5080	0.713	3.053	0.439	
164.00	16.8	31.8	17.7	0.5080	0.713	3.052	0.439	
165.00	16.7	31.8	17.8	0.5080	0.713	3.052	0.439	
166.00	16.6	31.8	17.7	0.5080	0.713	3.052	0.439	
167.00	16.5	31.8	17.7	0.5080	0.713	3.052	0.439	
168.00	16.4	31.7	17.5	0.5080	0.713	3.051	0.439	
169.00	16.3	31.7	17.6	0.5080	0.713	3.051	0.439	
170.00	16.2	31.6	17.7	0.5080	0.713	3.051	0.438	
171.00	16.1	31.6	17.4	0.5080	0.713	3.051	0.438	
172.00	16.0	31.5	17.6	0.5080	0.713	3.051	0.438	
173.00	15.9	31.6	17.6	0.5080	0.713	3.051	0.438	
174.00	15.8	31.6	17.7	0.5080	0.713	3.051	0.438	
175.00	15.7	31.5	17.4	0.5080	0.713	3.051	0.438	
176.00	15.6	31.5	17.6	0.5080	0.713	3.051	0.438	
177.00	15.5	31.5	17.8	0.5080	0.713	3.050	0.438	
178.00	15.4	31.5	17.7	0.5080	0.713	3.051	0.438	
179.00	15.3	31.5	17.4	0.5080	0.713	3.051	0.438	
180.00	15.2	31.6	17.5	0.5080	0.713	3.051	0.438	
181.00	15.1	31.7	17.7	0.5080	0.713	3.052	0.439	
182.00	15.0	31.7	17.8	0.5080	0.713	3.052	0.439	
183.00	14.9	31.7	17.5	0.5080	0.713	3.051	0.439	
184.00	14.8	31.7	17.6	0.5080	0.713	3.052	0.439	
185.00	14.7	31.8	17.7	0.5080	0.713	3.052	0.439	
186.00	14.6	31.7	17.7	0.5080	0.713	3.052	0.439	
187.00	14.5	31.9	17.9	0.5080	0.713	3.052	0.439	
188.00	14.4	31.8	17.8	0.5080	0.713	3.052	0.439	
189.00	14.3	31.9	17.8	0.5080	0.713	3.053	0.439	
190.00	14.2	31.9	17.9	0.5080	0.713	3.053	0.439	
191.00	14.1	31.8	17.6	0.5080	0.713	3.052	0.439	
192.00	14.0	31.9	17.8	0.5080	0.713	3.052	0.439	
193.00	13.9	31.8	17.6	0.5080	0.713	3.052	0.439	
194.00	13.8	31.8	17.7	0.5080	0.713	3.052	0.439	
195.00	13.7	31.8	17.6	0.5080	0.713	3.052	0.439	
196.00	13.6	31.8	17.9	0.5080	0.713	3.052	0.439	
197.00	13.6	31.7	17.8	0.5080	0.713	3.052	0.439	
198.00	13.4	31.6	17.8	0.5080	0.713	3.051	0.439	
199.00	13.4	31.7	18.0	0.5080	0.713	3.051	0.439	
200.00	13.3	31.8	18.1	0.5080	0.713	3.052	0.439	
201.00	13.2	31.7	18.4	0.5080	0.713	3.052	0.439	
202.00	13.1	31.6	18.3	0.5080	0.713	3.051	0.438	
203.00	13.1	34.8	18.0	0.5080	0.713	3.067	0.441	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 8 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
204.00	12.4	40.6	17.9	0.0000	0.000	0.000	0.000	
205.00	12.2	35.0	17.8	0.0000	0.000	0.000	0.000	
206.00	12.3	33.9	18.0	0.5080	0.713	3.062	0.440	
207.00	12.4	33.3	18.1	0.5080	0.713	3.059	0.440	
208.00	12.4	32.8	18.0	0.5080	0.713	3.057	0.439	
209.00	12.4	32.5	18.2	0.5080	0.713	3.056	0.439	
210.00	12.4	32.2	18.0	0.5080	0.713	3.054	0.439	
211.00	12.4	32.0	18.5	0.5080	0.713	3.053	0.439	
212.00	12.2	37.0	18.3	0.5080	0.713	3.078	0.442	
213.00	11.7	42.2	18.0	0.0000	0.000	0.000	0.000	
214.00	11.6	34.4	18.0	0.0000	0.000	0.000	0.000	
215.00	11.8	33.6	18.5	0.5080	0.713	3.061	0.440	
216.00	11.8	33.0	18.1	0.5080	0.713	3.058	0.439	
217.00	11.8	32.5	18.1	0.5080	0.713	3.055	0.439	
218.00	12.0	32.0	18.3	0.5080	0.713	3.053	0.439	
219.00	11.6	39.6	18.1	0.5080	0.713	3.091	0.444	
220.00	11.1	44.0	17.9	0.0000	0.000	0.000	0.000	
221.00	11.2	34.1	17.9	0.0000	0.000	0.000	0.000	
222.00	11.4	33.0	18.0	0.5080	0.713	3.058	0.439	
223.00	11.5	32.2	17.8	0.5080	0.713	3.054	0.439	
224.00	11.3	38.8	17.9	0.5080	0.713	3.087	0.444	
225.00	10.9	42.8	17.8	0.0000	0.000	0.000	0.000	
226.00	10.9	33.9	18.0	0.0000	0.000	0.000	0.000	
227.00	11.1	32.5	17.9	0.5080	0.713	3.055	0.439	
228.00	11.2	36.7	18.0	0.5080	0.713	3.077	0.442	
229.00	10.7	41.9	17.8	0.0000	0.000	0.000	0.000	
230.00	10.5	36.1	17.6	0.0000	0.000	0.000	0.000	
231.00	10.7	32.9	17.8	0.5080	0.713	3.057	0.439	
232.00	10.9	36.8	17.9	0.5080	0.713	3.077	0.442	
233.00	10.5	42.1	17.8	0.0000	0.000	0.000	0.000	
234.00	10.2	39.7	17.6	0.0000	0.000	0.000	0.000	
235.00	10.5	33.1	18.0	0.5080	0.713	3.059	0.440	
236.00	10.6	37.4	18.0	0.5080	0.713	3.080	0.443	
237.00	10.3	42.8	17.8	0.0000	0.000	0.000	0.000	
238.00	10.0	37.0	17.6	0.0000	0.000	0.000	0.000	
239.00	10.3	33.1	18.5	0.5080	0.713	3.058	0.440	
240.00	10.4	38.0	18.0	0.5080	0.713	3.083	0.443	
241.00	10.0	42.8	18.0	0.0000	0.000	0.000	0.000	
242.00	9.8	35.9	17.7	0.0000	0.000	0.000	0.000	
243.00	10.1	33.0	18.1	0.5080	0.713	3.058	0.439	
244.00	10.2	38.6	18.0	0.5080	0.713	3.086	0.443	
245.00	9.8	43.0	17.8	0.0000	0.000	0.000	0.000	
246.00	9.6	38.7	17.6	0.0000	0.000	0.000	0.000	
247.00	9.8	33.0	17.9	0.5080	0.713	3.058	0.439	
248.00	10.0	38.7	17.9	0.5080	0.713	3.086	0.444	
249.00	9.6	43.1	17.9	0.0000	0.000	0.000	0.000	
250.00	9.4	36.9	18.0	0.0000	0.000	0.000	0.000	
251.00	9.7	33.0	18.2	0.5080	0.713	3.058	0.439	
252.00	9.8	39.1	18.1	0.5080	0.713	3.089	0.444	
253.00	9.4	43.1	18.0	0.0000	0.000	0.000	0.000	
254.00	9.2	38.5	17.7	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 9 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
255.00	9.5	33.0	18.0	0.5080	0.713	3.058	0.439	
256.00	9.5	39.7	18.0	0.5080	0.713	3.091	0.444	
257.00	9.2	43.4	17.9	0.0000	0.000	0.000	0.000	
258.00	9.1	35.9	17.9	0.0000	0.000	0.000	0.000	
259.00	9.3	32.8	18.4	0.5080	0.713	3.057	0.439	
260.00	9.3	40.0	18.1	0.0000	0.000	0.000	0.000	
261.00	9.0	43.5	18.0	0.0000	0.000	0.000	0.000	
262.00	8.9	35.7	17.8	0.0000	0.000	0.000	0.000	
263.00	9.3	33.2	18.4	0.5080	0.713	3.059	0.440	
264.00	9.1	41.2	18.1	0.0000	0.000	0.000	0.000	
265.00	8.8	44.1	17.9	0.0000	0.000	0.000	0.000	
266.00	8.7	34.6	18.1	0.0000	0.000	0.000	0.000	
267.00	9.1	33.7	18.2	0.5080	0.713	3.062	0.440	
268.00	8.9	41.6	18.0	0.0000	0.000	0.000	0.000	
269.00	8.6	44.0	17.9	0.0000	0.000	0.000	0.000	
270.00	8.6	34.6	17.8	0.0000	0.000	0.000	0.000	
271.00	8.9	33.8	18.3	0.5080	0.713	3.062	0.440	
272.00	8.7	41.5	18.1	0.0000	0.000	0.000	0.000	
273.00	8.4	44.0	17.9	0.0000	0.000	0.000	0.000	
274.00	8.4	34.2	17.8	0.0000	0.000	0.000	0.000	
275.00	8.8	34.5	18.2	0.5080	0.713	3.066	0.441	
276.00	8.5	41.6	17.9	0.0000	0.000	0.000	0.000	
277.00	8.2	44.1	17.8	0.0000	0.000	0.000	0.000	
278.00	8.2	34.5	17.9	0.0000	0.000	0.000	0.000	
279.00	8.6	34.2	18.3	0.5080	0.713	3.064	0.440	
280.00	8.3	41.5	18.0	0.0000	0.000	0.000	0.000	
281.00	8.1	44.1	17.9	0.0000	0.000	0.000	0.000	
282.00	8.1	34.2	18.2	0.0000	0.000	0.000	0.000	
283.00	8.4	35.6	18.3	0.5080	0.713	3.071	0.441	
284.00	8.1	42.1	18.1	0.0000	0.000	0.000	0.000	
285.00	7.9	44.5	17.9	0.0000	0.000	0.000	0.000	
286.00	7.9	34.1	18.1	0.0000	0.000	0.000	0.000	
287.00	8.2	35.6	18.2	0.5080	0.713	3.071	0.441	
288.00	8.0	42.1	18.0	0.0000	0.000	0.000	0.000	
289.00	7.7	44.5	17.9	0.0000	0.000	0.000	0.000	
290.00	7.8	33.9	18.2	0.0000	0.000	0.000	0.000	
291.00	8.1	36.2	18.1	0.5080	0.713	3.074	0.442	
292.00	7.8	42.3	18.0	0.0000	0.000	0.000	0.000	
293.00	7.6	44.5	17.9	0.0000	0.000	0.000	0.000	
294.00	7.6	33.8	18.5	0.0000	0.000	0.000	0.000	
295.00	7.9	36.8	18.1	0.5080	0.713	3.077	0.442	
296.00	7.7	42.4	18.0	0.0000	0.000	0.000	0.000	
297.00	7.4	44.6	17.9	0.0000	0.000	0.000	0.000	
298.00	7.5	33.7	18.1	0.0000	0.000	0.000	0.000	
299.00	7.8	36.8	18.2	0.5080	0.713	3.077	0.442	
300.00	7.6	42.4	18.0	0.0000	0.000	0.000	0.000	
301.00	7.3	44.5	17.9	0.0000	0.000	0.000	0.000	
302.00	7.4	33.8	18.4	0.0000	0.000	0.000	0.000	
303.00	7.7	36.9	18.1	0.7620	0.873	3.769	0.542	
304.00	7.4	42.3	18.0	0.0000	0.000	0.000	0.000	
305.00	7.2	44.4	17.9	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 10 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
306.00	7.3	34.0	18.1	0.0000	0.000	0.000	0.000	
307.00	7.5	36.5	18.1	0.5080	0.713	3.076	0.442	
308.00	7.3	42.3	17.9	0.0000	0.000	0.000	0.000	
309.00	7.1	44.2	17.9	0.0000	0.000	0.000	0.000	
310.00	7.1	34.0	17.9	0.0000	0.000	0.000	0.000	
311.00	7.4	36.9	18.1	0.5080	0.713	3.078	0.442	
312.00	7.2	42.5	18.0	0.0000	0.000	0.000	0.000	
313.00	6.9	44.4	17.9	0.0000	0.000	0.000	0.000	
314.00	7.0	34.0	18.2	0.0000	0.000	0.000	0.000	
315.00	7.3	36.4	18.1	0.5080	0.713	3.075	0.442	
316.00	7.1	42.2	18.1	0.0000	0.000	0.000	0.000	
317.00	6.8	44.2	18.0	0.0000	0.000	0.000	0.000	
318.00	6.9	34.3	18.1	0.0000	0.000	0.000	0.000	
319.00	7.2	35.4	18.3	0.5080	0.713	3.070	0.441	
320.00	7.0	41.9	18.2	0.0000	0.000	0.000	0.000	
321.00	6.7	44.0	18.0	0.0000	0.000	0.000	0.000	
322.00	6.7	34.8	17.9	0.0000	0.000	0.000	0.000	
323.00	7.1	33.9	18.4	0.5080	0.713	3.063	0.440	
324.00	6.9	41.3	18.1	0.0000	0.000	0.000	0.000	
325.00	6.7	43.6	18.0	0.0000	0.000	0.000	0.000	
326.00	6.5	36.9	17.8	0.0000	0.000	0.000	0.000	
327.00	7.0	32.9	18.5	0.5080	0.713	3.058	0.439	
328.00	6.8	40.8	18.2	0.0000	0.000	0.000	0.000	
329.00	6.6	43.6	18.0	0.0000	0.000	0.000	0.000	
330.00	6.4	47.7	17.9	0.0000	0.000	0.000	0.000	
331.00	6.7	33.0	18.5	0.6350	0.797	3.419	0.491	
332.00	6.8	39.9	18.2	0.5080	0.713	3.093	0.444	
333.00	6.5	43.4	18.1	0.0000	0.000	0.000	0.000	
334.00	6.4	45.0	18.0	0.0000	0.000	0.000	0.000	
335.00	6.6	33.4	18.4	0.0000	0.000	0.000	0.000	
336.00	6.8	38.8	18.2	0.5080	0.713	3.087	0.444	
337.00	6.5	42.9	18.1	0.0000	0.000	0.000	0.000	
338.00	6.3	44.7	18.0	0.0000	0.000	0.000	0.000	
339.00	6.5	33.6	18.5	0.0000	0.000	0.000	0.000	
340.00	6.7	37.9	18.1	0.0000	0.000	0.000	0.000	
341.00	6.5	42.6	18.1	0.0000	0.000	0.000	0.000	
342.00	6.3	44.5	18.0	0.0000	0.000	0.000	0.000	
343.00	6.3	34.6	18.0	0.0000	0.000	0.000	0.000	
344.00	6.6	35.9	18.3	0.5080	0.713	3.072	0.442	
345.00	6.5	42.1	18.1	0.0000	0.000	0.000	0.000	
346.00	6.2	44.2	18.0	0.0000	0.000	0.000	0.000	
347.00	6.2	35.7	18.0	0.0000	0.000	0.000	0.000	
348.00	6.6	33.8	18.3	0.5080	0.713	3.062	0.440	
349.00	6.4	41.4	18.1	0.0000	0.000	0.000	0.000	
350.00	6.2	43.7	18.1	0.0000	0.000	0.000	0.000	
351.00	6.1	46.5	17.8	0.0000	0.000	0.000	0.000	
352.00	6.3	32.9	18.3	0.5080	0.713	3.058	0.439	
353.00	6.4	40.2	18.2	0.5080	0.713	3.094	0.445	
354.00	6.2	43.3	18.1	0.0000	0.000	0.000	0.000	
355.00	6.0	44.7	18.0	0.0000	0.000	0.000	0.000	
356.00	6.2	33.5	18.4	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 11 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
357.00	6.4	38.8	18.2	0.5080	0.713	3.087	0.444	
358.00	6.2	42.9	18.1	0.0000	0.000	0.000	0.000	
359.00	6.0	44.6	17.9	0.0000	0.000	0.000	0.000	
360.00	6.1	33.7	18.4	0.0000	0.000	0.000	0.000	
361.00	6.3	37.8	18.3	0.5080	0.713	3.082	0.443	
362.00	6.1	42.6	18.1	0.0000	0.000	0.000	0.000	
363.00	5.9	44.4	18.0	0.0000	0.000	0.000	0.000	
364.00	5.9	35.0	18.0	0.0000	0.000	0.000	0.000	
365.00	6.3	34.7	18.4	0.5080	0.713	3.066	0.441	
366.00	6.1	41.6	18.1	0.0000	0.000	0.000	0.000	
367.00	5.9	43.7	18.0	0.0000	0.000	0.000	0.000	
368.00	5.7	47.6	17.8	0.0000	0.000	0.000	0.000	
369.00	6.0	33.1	18.5	0.5080	0.713	3.058	0.440	
370.00	6.1	40.4	18.1	0.0000	0.000	0.000	0.000	
371.00	5.9	43.3	18.0	0.0000	0.000	0.000	0.000	
372.00	5.7	44.9	17.9	0.0000	0.000	0.000	0.000	
373.00	5.9	33.3	18.4	0.0000	0.000	0.000	0.000	
374.00	6.1	39.3	18.1	0.5080	0.713	3.089	0.444	
375.00	5.8	43.1	18.0	0.0000	0.000	0.000	0.000	
376.00	5.7	44.7	17.9	0.0000	0.000	0.000	0.000	
377.00	5.7	34.0	18.1	0.0000	0.000	0.000	0.000	
378.00	6.0	37.2	18.2	0.5080	0.713	3.079	0.443	
379.00	5.8	42.5	18.1	0.0000	0.000	0.000	0.000	
380.00	5.6	44.3	18.0	0.0000	0.000	0.000	0.000	
381.00	5.6	34.6	17.9	0.0000	0.000	0.000	0.000	
382.00	6.0	36.3	18.3	0.5080	0.713	3.075	0.442	
383.00	5.8	42.2	18.1	0.0000	0.000	0.000	0.000	
384.00	5.6	44.0	17.9	0.0000	0.000	0.000	0.000	
385.00	5.5	36.6	17.7	0.0000	0.000	0.000	0.000	
386.00	5.9	34.3	18.2	0.5080	0.713	3.064	0.440	
387.00	5.7	41.8	17.9	0.0000	0.000	0.000	0.000	
388.00	5.5	43.8	17.9	0.0000	0.000	0.000	0.000	
389.00	5.4	45.3	17.8	0.0000	0.000	0.000	0.000	
390.00	5.6	32.9	18.0	0.5080	0.713	3.057	0.439	
391.00	5.7	40.0	18.0	0.5080	0.713	3.093	0.445	
392.00	5.5	43.2	17.9	0.0000	0.000	0.000	0.000	
393.00	5.4	44.6	17.8	0.0000	0.000	0.000	0.000	
394.00	5.5	33.5	18.0	0.0000	0.000	0.000	0.000	
395.00	5.7	38.1	18.0	0.5080	0.713	3.083	0.443	
396.00	5.5	42.6	17.9	0.0000	0.000	0.000	0.000	
397.00	5.3	44.2	17.8	0.0000	0.000	0.000	0.000	
398.00	5.3	34.8	17.7	0.0000	0.000	0.000	0.000	
399.00	5.7	35.7	18.1	0.5080	0.713	3.072	0.441	
400.00	5.5	42.1	17.9	0.0000	0.000	0.000	0.000	
401.00	5.3	43.9	17.8	0.0000	0.000	0.000	0.000	
402.00	5.2	37.6	17.7	0.0000	0.000	0.000	0.000	
403.00	5.6	34.0	18.3	0.5080	0.713	3.063	0.440	
404.00	5.5	41.4	17.9	0.0000	0.000	0.000	0.000	
405.00	5.3	43.6	17.8	0.0000	0.000	0.000	0.000	
406.00	5.1	45.0	17.8	0.0000	0.000	0.000	0.000	
407.00	5.3	32.9	18.1	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 12 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
408.00	5.5	39.7	18.0	0.5080	0.713	3.091	0.444	
409.00	5.3	43.1	17.9	0.0000	0.000	0.000	0.000	
410.00	5.1	44.6	17.9	0.0000	0.000	0.000	0.000	
411.00	5.2	33.7	17.8	0.0000	0.000	0.000	0.000	
412.00	5.5	37.2	18.0	0.5080	0.713	3.079	0.443	
413.00	5.3	42.2	17.9	0.0000	0.000	0.000	0.000	
414.00	5.1	44.1	17.9	0.0000	0.000	0.000	0.000	
415.00	5.0	35.8	17.8	0.0000	0.000	0.000	0.000	
416.00	5.4	34.8	18.2	0.5080	0.713	3.067	0.441	
417.00	5.2	41.7	18.0	0.0000	0.000	0.000	0.000	
418.00	5.0	43.7	17.9	0.0000	0.000	0.000	0.000	
419.00	4.9	47.2	17.7	0.0000	0.000	0.000	0.000	
420.00	5.1	32.7	18.6	0.5080	0.713	3.057	0.439	
421.00	5.2	40.7	18.0	0.0000	0.000	0.000	0.000	
422.00	5.0	43.3	17.9	0.0000	0.000	0.000	0.000	
423.00	4.8	44.7	17.8	0.0000	0.000	0.000	0.000	
424.00	5.0	33.2	18.0	0.0000	0.000	0.000	0.000	
425.00	5.2	39.2	18.0	0.5080	0.713	3.089	0.444	
426.00	5.0	42.9	17.9	0.0000	0.000	0.000	0.000	
427.00	4.8	44.4	17.8	0.0000	0.000	0.000	0.000	
428.00	4.9	33.8	17.9	0.0000	0.000	0.000	0.000	
429.00	5.2	37.7	18.1	0.5080	0.713	3.081	0.443	
430.00	5.0	42.4	18.0	0.0000	0.000	0.000	0.000	
431.00	4.8	44.0	17.8	0.0000	0.000	0.000	0.000	
432.00	4.7	35.0	17.9	0.0000	0.000	0.000	0.000	
433.00	5.1	35.7	18.2	0.5080	0.713	3.071	0.441	
434.00	4.9	41.9	17.9	0.0000	0.000	0.000	0.000	
435.00	4.8	43.9	17.8	0.0000	0.000	0.000	0.000	
436.00	4.6	47.7	17.6	0.0000	0.000	0.000	0.000	
437.00	5.0	32.8	18.2	0.5080	0.713	3.057	0.439	
438.00	4.9	40.8	18.0	0.0000	0.000	0.000	0.000	
439.00	4.7	43.3	17.9	0.0000	0.000	0.000	0.000	
440.00	4.6	44.9	17.8	0.0000	0.000	0.000	0.000	
441.00	4.7	33.1	18.0	0.0000	0.000	0.000	0.000	
442.00	4.9	39.4	18.0	0.5080	0.713	3.090	0.444	
443.00	4.7	42.9	17.9	0.0000	0.000	0.000	0.000	
444.00	4.5	44.5	17.8	0.0000	0.000	0.000	0.000	
445.00	4.6	34.0	17.8	0.0000	0.000	0.000	0.000	
446.00	4.9	37.4	18.2	0.5080	0.713	3.080	0.443	
447.00	4.7	42.4	18.0	0.0000	0.000	0.000	0.000	
448.00	4.5	44.1	17.9	0.0000	0.000	0.000	0.000	
449.00	4.4	37.7	17.6	0.0000	0.000	0.000	0.000	
450.00	4.8	33.9	18.1	0.5080	0.713	3.063	0.440	
451.00	4.7	41.5	17.9	0.0000	0.000	0.000	0.000	
452.00	4.5	43.6	17.9	0.0000	0.000	0.000	0.000	
453.00	4.3	45.0	17.8	0.0000	0.000	0.000	0.000	
454.00	4.6	32.9	18.0	0.0000	0.000	0.000	0.000	
455.00	4.7	40.3	18.0	0.5080	0.713	3.095	0.445	
456.00	4.5	43.2	17.8	0.0000	0.000	0.000	0.000	
457.00	4.3	44.7	17.7	0.0000	0.000	0.000	0.000	
458.00	4.4	33.6	17.9	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 13 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
459.00	4.7	38.4	18.1	0.5080	0.713	3.085	0.443	
460.00	4.5	42.7	17.9	0.0000	0.000	0.000	0.000	
461.00	4.3	44.4	17.8	0.0000	0.000	0.000	0.000	
462.00	4.3	34.1	17.9	0.0000	0.000	0.000	0.000	
463.00	4.6	37.0	18.1	0.5080	0.713	3.078	0.442	
464.00	4.4	42.4	17.9	0.0000	0.000	0.000	0.000	
465.00	4.3	44.0	17.8	0.0000	0.000	0.000	0.000	
466.00	4.2	35.7	17.8	0.0000	0.000	0.000	0.000	
467.00	4.6	34.8	17.9	0.5080	0.713	3.067	0.441	
468.00	4.4	41.7	17.8	0.0000	0.000	0.000	0.000	
469.00	4.2	43.8	17.7	0.0000	0.000	0.000	0.000	
470.00	4.1	41.5	17.7	0.0000	0.000	0.000	0.000	
471.00	4.5	32.9	18.2	0.5080	0.713	3.057	0.439	
472.00	4.4	41.0	17.9	0.0000	0.000	0.000	0.000	
473.00	4.2	43.5	17.8	0.0000	0.000	0.000	0.000	
474.00	4.0	44.9	17.7	0.0000	0.000	0.000	0.000	
475.00	4.2	33.0	17.8	0.0000	0.000	0.000	0.000	
476.00	4.4	39.7	17.8	0.5080	0.713	3.091	0.444	
477.00	4.2	43.0	17.8	0.0000	0.000	0.000	0.000	
478.00	4.0	44.6	17.7	0.0000	0.000	0.000	0.000	
479.00	4.1	33.5	17.9	0.0000	0.000	0.000	0.000	
480.00	4.3	38.1	18.0	0.5080	0.713	3.083	0.443	
481.00	4.2	42.6	17.8	0.0000	0.000	0.000	0.000	
482.00	4.0	44.2	17.8	0.0000	0.000	0.000	0.000	
483.00	4.0	34.8	17.7	0.0000	0.000	0.000	0.000	
484.00	4.3	35.7	17.9	0.5080	0.713	3.072	0.441	
485.00	4.1	41.8	17.8	0.0000	0.000	0.000	0.000	
486.00	4.0	43.8	17.8	0.0000	0.000	0.000	0.000	
487.00	3.8	44.7	17.4	0.0000	0.000	0.000	0.000	
488.00	4.2	32.7	18.2	0.5080	0.713	3.057	0.439	
489.00	4.1	40.7	18.0	0.0000	0.000	0.000	0.000	
490.00	3.9	43.3	17.7	0.0000	0.000	0.000	0.000	
491.00	3.8	44.7	17.6	0.0000	0.000	0.000	0.000	
492.00	4.0	33.0	18.1	0.0000	0.000	0.000	0.000	
493.00	4.1	39.8	17.9	0.5080	0.713	3.092	0.444	
494.00	3.9	43.0	17.7	0.0000	0.000	0.000	0.000	
495.00	3.8	44.5	17.6	0.0000	0.000	0.000	0.000	
496.00	3.8	33.6	17.8	0.0000	0.000	0.000	0.000	
497.00	4.1	37.8	17.9	0.5080	0.713	3.082	0.443	
498.00	3.9	42.4	17.8	0.0000	0.000	0.000	0.000	
499.00	3.8	44.1	17.7	0.0000	0.000	0.000	0.000	
500.00	3.7	35.7	17.7	0.0000	0.000	0.000	0.000	
501.00	4.1	34.5	17.9	0.5080	0.713	3.066	0.441	
502.00	3.9	41.4	17.8	0.0000	0.000	0.000	0.000	
503.00	3.7	43.5	17.7	0.0000	0.000	0.000	0.000	
504.00	3.6	44.7	17.6	0.0000	0.000	0.000	0.000	
505.00	3.8	32.8	18.2	0.0000	0.000	0.000	0.000	
506.00	3.9	39.9	17.8	0.5080	0.713	3.092	0.444	
507.00	3.7	43.1	17.7	0.0000	0.000	0.000	0.000	
508.00	3.6	44.4	17.7	0.0000	0.000	0.000	0.000	
509.00	3.7	33.4	17.8	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 14 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
510.00	3.9	38.3	17.9	0.5080	0.713	3.084	0.443	
511.00	3.7	42.5	17.8	0.0000	0.000	0.000	0.000	
512.00	3.5	44.1	17.7	0.0000	0.000	0.000	0.000	
513.00	3.5	35.4	17.5	0.0000	0.000	0.000	0.000	
514.00	3.9	35.4	17.9	0.5080	0.713	3.070	0.441	
515.00	3.7	41.8	17.7	0.0000	0.000	0.000	0.000	
516.00	3.5	43.6	17.6	0.0000	0.000	0.000	0.000	
517.00	3.4	44.8	17.6	0.0000	0.000	0.000	0.000	
518.00	3.6	32.6	18.1	0.0000	0.000	0.000	0.000	
519.00	3.7	40.3	17.8	0.3810	0.617	2.680	0.385	
520.00	3.5	43.1	17.7	0.0000	0.000	0.000	0.000	
521.00	3.4	44.5	17.5	0.0000	0.000	0.000	0.000	
522.00	3.4	33.4	17.9	0.0000	0.000	0.000	0.000	
523.00	3.7	37.9	17.8	0.5080	0.713	3.082	0.443	
524.00	3.5	42.4	17.7	0.0000	0.000	0.000	0.000	
525.00	3.4	43.9	17.6	0.0000	0.000	0.000	0.000	
526.00	3.3	36.0	17.5	0.0000	0.000	0.000	0.000	
527.00	3.7	34.8	17.8	0.5080	0.713	3.067	0.441	
528.00	3.5	41.5	17.7	0.0000	0.000	0.000	0.000	
529.00	3.4	43.3	17.6	0.0000	0.000	0.000	0.000	
530.00	3.2	44.6	17.5	0.0000	0.000	0.000	0.000	
531.00	3.4	32.9	17.7	0.0000	0.000	0.000	0.000	
532.00	3.5	39.2	17.7	0.5080	0.713	3.089	0.444	
533.00	3.4	42.8	17.7	0.0000	0.000	0.000	0.000	
534.00	3.2	44.1	17.6	0.0000	0.000	0.000	0.000	
535.00	3.2	34.4	17.6	0.0000	0.000	0.000	0.000	
536.00	3.5	36.1	17.9	0.5080	0.713	3.074	0.442	
537.00	3.4	41.8	17.8	0.0000	0.000	0.000	0.000	
538.00	3.2	43.5	17.7	0.0000	0.000	0.000	0.000	
539.00	3.1	44.7	17.6	0.0000	0.000	0.000	0.000	
540.00	3.3	32.7	18.0	0.5080	0.713	3.057	0.439	
541.00	3.4	39.9	17.8	0.5080	0.713	3.092	0.444	
542.00	3.2	42.8	17.7	0.0000	0.000	0.000	0.000	
543.00	3.1	44.1	17.6	0.0000	0.000	0.000	0.000	
544.00	3.1	34.4	17.6	0.0000	0.000	0.000	0.000	
545.00	3.4	36.2	17.9	0.5080	0.713	3.074	0.442	
546.00	3.3	41.8	17.7	0.0000	0.000	0.000	0.000	
547.00	3.1	43.4	17.6	0.0000	0.000	0.000	0.000	
548.00	2.9	44.7	17.6	0.0000	0.000	0.000	0.000	
549.00	3.1	32.8	17.9	0.0000	0.000	0.000	0.000	
550.00	3.3	39.7	17.8	0.1270	0.356	1.546	0.222	
551.00	3.1	42.7	17.7	0.0000	0.000	0.000	0.000	
552.00	2.9	44.0	17.6	0.0000	0.000	0.000	0.000	
553.00	2.9	34.9	17.6	0.0000	0.000	0.000	0.000	
554.00	3.3	35.9	17.9	0.5080	0.713	3.072	0.442	
555.00	3.1	41.7	17.7	0.0000	0.000	0.000	0.000	
556.00	3.0	43.4	17.7	0.0000	0.000	0.000	0.000	
557.00	2.8	44.5	17.6	0.0000	0.000	0.000	0.000	
558.00	3.0	32.8	17.9	0.0000	0.000	0.000	0.000	
559.00	3.2	39.3	17.8	0.5080	0.713	3.089	0.444	
560.00	3.0	42.5	17.7	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 15 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
561.00	2.8	43.8	17.6	0.0000	0.000	0.000	0.000	
562.00	2.7	38.2	17.4	0.0000	0.000	0.000	0.000	
563.00	3.1	34.9	17.9	0.5080	0.713	3.067	0.441	
564.00	3.0	41.5	17.7	0.0000	0.000	0.000	0.000	
565.00	2.8	43.2	17.6	0.0000	0.000	0.000	0.000	
566.00	2.7	44.6	17.5	0.0000	0.000	0.000	0.000	
567.00	2.8	32.9	17.9	0.0000	0.000	0.000	0.000	
568.00	3.0	39.0	17.7	0.5080	0.713	3.088	0.444	
569.00	2.9	42.4	17.6	0.0000	0.000	0.000	0.000	
570.00	2.7	43.8	17.6	0.0000	0.000	0.000	0.000	
571.00	2.6	40.4	17.3	0.0000	0.000	0.000	0.000	
572.00	3.0	34.2	17.8	0.5080	0.713	3.064	0.440	
573.00	2.9	41.3	17.7	0.0000	0.000	0.000	0.000	
574.00	2.7	43.1	17.6	0.0000	0.000	0.000	0.000	
575.00	2.6	44.3	17.5	0.0000	0.000	0.000	0.000	
576.00	2.7	33.1	17.8	0.0000	0.000	0.000	0.000	
577.00	2.9	38.8	17.7	0.5080	0.713	3.087	0.444	
578.00	2.8	42.4	17.7	0.0000	0.000	0.000	0.000	
579.00	2.6	43.8	17.6	0.0000	0.000	0.000	0.000	
580.00	2.5	44.5	17.2	0.0000	0.000	0.000	0.000	
581.00	2.9	33.0	18.0	0.5080	0.713	3.058	0.440	
582.00	2.8	40.7	17.8	0.0000	0.000	0.000	0.000	
583.00	2.6	42.9	17.7	0.0000	0.000	0.000	0.000	
584.00	2.5	44.1	17.6	0.0000	0.000	0.000	0.000	
585.00	2.5	34.0	17.7	0.0000	0.000	0.000	0.000	
586.00	2.8	37.1	17.8	0.5080	0.713	3.079	0.442	
587.00	2.7	41.9	17.7	0.0000	0.000	0.000	0.000	
588.00	2.5	43.4	17.6	0.0000	0.000	0.000	0.000	
589.00	2.4	44.5	17.6	0.0000	0.000	0.000	0.000	
590.00	2.6	32.6	17.9	0.5080	0.713	3.056	0.439	
591.00	2.7	39.4	17.8	0.5080	0.713	3.090	0.444	
592.00	2.6	42.5	17.7	0.0000	0.000	0.000	0.000	
593.00	2.4	43.6	17.6	0.0000	0.000	0.000	0.000	
594.00	2.3	41.7	17.3	0.0000	0.000	0.000	0.000	
595.00	2.7	33.7	17.9	0.5080	0.713	3.062	0.440	
596.00	2.6	41.0	17.7	0.0000	0.000	0.000	0.000	
597.00	2.4	42.9	17.7	0.0000	0.000	0.000	0.000	
598.00	2.3	44.0	17.6	0.0000	0.000	0.000	0.000	
599.00	2.3	33.8	17.8	0.0000	0.000	0.000	0.000	
600.00	2.6	37.2	17.9	0.5080	0.713	3.079	0.443	
601.00	2.5	41.9	17.7	0.0000	0.000	0.000	0.000	
602.00	2.3	43.3	17.6	0.0000	0.000	0.000	0.000	
603.00	2.2	44.4	17.6	0.0000	0.000	0.000	0.000	
604.00	2.4	32.8	17.8	0.0000	0.000	0.000	0.000	
605.00	2.5	39.1	17.8	0.5080	0.713	3.089	0.444	
606.00	2.4	42.3	17.7	0.0000	0.000	0.000	0.000	
607.00	2.2	43.6	17.6	0.0000	0.000	0.000	0.000	
608.00	2.1	41.0	17.2	0.0000	0.000	0.000	0.000	
609.00	2.5	33.9	18.0	0.5080	0.713	3.063	0.440	
610.00	2.4	40.9	17.8	0.0000	0.000	0.000	0.000	
611.00	2.3	42.7	17.7	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 16 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
612.00	2.1	43.9	17.7	0.0000	0.000	0.000	0.000	
613.00	2.1	34.4	17.7	0.0000	0.000	0.000	0.000	
614.00	2.4	36.3	17.9	0.5080	0.713	3.075	0.442	
615.00	2.3	41.5	17.8	0.0000	0.000	0.000	0.000	
616.00	2.2	43.1	17.6	0.0000	0.000	0.000	0.000	
617.00	2.0	44.1	17.6	0.0000	0.000	0.000	0.000	
618.00	2.1	33.4	17.9	0.0000	0.000	0.000	0.000	
619.00	2.4	37.7	17.9	0.5080	0.713	3.081	0.443	
620.00	2.2	41.9	17.7	0.0000	0.000	0.000	0.000	
621.00	2.1	43.2	17.6	0.0000	0.000	0.000	0.000	
622.00	2.0	44.3	17.7	0.0000	0.000	0.000	0.000	
623.00	2.1	32.8	17.9	0.0000	0.000	0.000	0.000	
624.00	2.3	38.8	17.8	0.5080	0.713	3.087	0.444	
625.00	2.1	42.2	17.7	0.0000	0.000	0.000	0.000	
626.00	2.0	43.4	17.7	0.0000	0.000	0.000	0.000	
627.00	1.9	44.4	17.6	0.0000	0.000	0.000	0.000	
628.00	2.1	32.3	18.0	0.0000	0.000	0.000	0.000	
629.00	2.2	39.8	17.8	0.2540	0.504	2.186	0.314	
630.00	2.0	42.3	17.7	0.0000	0.000	0.000	0.000	
631.00	1.9	43.5	17.6	0.0000	0.000	0.000	0.000	
632.00	1.8	44.5	17.6	0.0000	0.000	0.000	0.000	
633.00	2.0	32.4	18.1	0.0000	0.000	0.000	0.000	
634.00	2.1	39.9	17.8	0.5080	0.713	3.093	0.444	
635.00	2.0	42.4	17.8	0.0000	0.000	0.000	0.000	
636.00	1.9	43.6	17.6	0.0000	0.000	0.000	0.000	
637.00	1.7	44.5	17.7	0.0000	0.000	0.000	0.000	
638.00	2.1	33.1	18.1	0.0000	0.000	0.000	0.000	
639.00	2.0	40.6	17.8	0.0000	0.000	0.000	0.000	
640.00	1.9	42.8	17.8	0.0000	0.000	0.000	0.000	
641.00	1.8	43.8	17.7	0.0000	0.000	0.000	0.000	
642.00	1.7	35.1	17.6	0.0000	0.000	0.000	0.000	
643.00	2.1	36.2	18.0	0.5080	0.713	3.074	0.442	
644.00	2.0	41.6	17.8	0.0000	0.000	0.000	0.000	
645.00	1.8	43.0	17.8	0.0000	0.000	0.000	0.000	
646.00	1.7	44.0	17.7	0.0000	0.000	0.000	0.000	
647.00	1.7	33.7	18.0	0.0000	0.000	0.000	0.000	
648.00	2.0	37.5	18.0	0.5080	0.713	3.081	0.443	
649.00	1.9	41.9	17.8	0.0000	0.000	0.000	0.000	
650.00	1.7	43.1	17.7	0.0000	0.000	0.000	0.000	
651.00	1.6	44.2	17.7	0.0000	0.000	0.000	0.000	
652.00	1.7	33.0	18.3	0.0000	0.000	0.000	0.000	
653.00	1.9	38.9	17.9	0.5080	0.713	3.088	0.444	
654.00	1.8	42.2	17.8	0.0000	0.000	0.000	0.000	
655.00	1.7	43.4	17.8	0.0000	0.000	0.000	0.000	
656.00	1.6	44.3	17.7	0.0000	0.000	0.000	0.000	
657.00	1.7	32.5	18.1	0.0000	0.000	0.000	0.000	
658.00	1.9	39.3	17.9	0.5080	0.713	3.089	0.444	
659.00	1.7	42.2	17.8	0.0000	0.000	0.000	0.000	
660.00	1.6	43.3	17.8	0.0000	0.000	0.000	0.000	
661.00	1.5	44.1	17.8	0.0000	0.000	0.000	0.000	
662.00	1.7	32.9	18.2	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 17 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
663.00	1.8	38.7	18.0	0.5080	0.713	3.086	0.444	
664.00	1.7	42.0	17.9	0.0000	0.000	0.000	0.000	
665.00	1.6	43.1	17.8	0.0000	0.000	0.000	0.000	
666.00	1.5	44.1	17.8	0.0000	0.000	0.000	0.000	
667.00	1.5	33.2	17.9	0.0000	0.000	0.000	0.000	
668.00	1.8	38.5	18.0	0.5080	0.713	3.085	0.443	
669.00	1.6	42.0	17.9	0.0000	0.000	0.000	0.000	
670.00	1.5	43.3	17.8	0.0000	0.000	0.000	0.000	
671.00	1.4	44.1	17.8	0.0000	0.000	0.000	0.000	
672.00	1.5	32.9	18.1	0.0000	0.000	0.000	0.000	
673.00	1.7	38.8	18.0	0.5080	0.713	3.087	0.444	
674.00	1.6	42.0	17.9	0.0000	0.000	0.000	0.000	
675.00	1.5	43.2	17.9	0.0000	0.000	0.000	0.000	
676.00	1.3	44.0	17.8	0.0000	0.000	0.000	0.000	
677.00	1.5	32.8	18.1	0.0000	0.000	0.000	0.000	
678.00	1.7	38.8	18.0	0.5080	0.713	3.087	0.444	
679.00	1.5	41.9	17.9	0.0000	0.000	0.000	0.000	
680.00	1.4	43.0	17.8	0.0000	0.000	0.000	0.000	
681.00	1.3	44.0	17.8	0.0000	0.000	0.000	0.000	
682.00	1.4	33.2	17.9	0.0000	0.000	0.000	0.000	
683.00	1.6	38.0	18.0	0.5080	0.713	3.083	0.443	
684.00	1.5	41.7	17.8	0.0000	0.000	0.000	0.000	
685.00	1.4	43.0	17.8	0.0000	0.000	0.000	0.000	
686.00	1.3	43.7	17.8	0.0000	0.000	0.000	0.000	
687.00	1.3	34.6	17.8	0.0000	0.000	0.000	0.000	
688.00	1.6	36.6	18.0	0.5080	0.713	3.076	0.442	
689.00	1.4	41.3	17.9	0.0000	0.000	0.000	0.000	
690.00	1.3	42.7	17.8	0.0000	0.000	0.000	0.000	
691.00	1.2	43.6	17.8	0.0000	0.000	0.000	0.000	
692.00	1.1	37.8	17.7	0.0000	0.000	0.000	0.000	
693.00	1.5	35.0	18.1	0.5080	0.713	3.068	0.441	
694.00	1.4	41.1	17.9	0.0000	0.000	0.000	0.000	
695.00	1.3	42.4	17.8	0.0000	0.000	0.000	0.000	
696.00	1.2	43.5	17.8	0.0000	0.000	0.000	0.000	
697.00	1.1	44.1	17.9	0.0000	0.000	0.000	0.000	
698.00	1.3	32.4	18.1	0.0000	0.000	0.000	0.000	
699.00	1.4	39.8	18.0	0.0000	0.000	0.000	0.000	
700.00	1.3	42.2	17.9	0.0000	0.000	0.000	0.000	
701.00	1.2	43.2	17.8	0.0000	0.000	0.000	0.000	
702.00	1.1	43.9	17.8	0.0000	0.000	0.000	0.000	
703.00	1.1	33.3	18.0	0.0000	0.000	0.000	0.000	
704.00	1.4	37.8	18.0	0.5080	0.713	3.082	0.443	
705.00	1.3	41.7	17.9	0.0000	0.000	0.000	0.000	
706.00	1.2	42.7	17.8	0.0000	0.000	0.000	0.000	
707.00	1.1	43.7	17.8	0.0000	0.000	0.000	0.000	
708.00	1.0	44.4	17.8	0.0000	0.000	0.000	0.000	
709.00	1.3	33.4	18.2	0.0000	0.000	0.000	0.000	
710.00	1.3	40.4	17.9	0.0000	0.000	0.000	0.000	
711.00	1.1	42.3	17.9	0.0000	0.000	0.000	0.000	
712.00	1.0	43.2	17.8	0.0000	0.000	0.000	0.000	
713.00	1.0	44.0	17.8	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 18 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
714.00	1.1	33.0	18.0	0.0000	0.000	0.000	0.000	
715.00	1.3	38.3	18.0	0.5080	0.713	3.084	0.443	
716.00	1.1	41.6	17.9	0.0000	0.000	0.000	0.000	
717.00	1.0	42.7	17.8	0.0000	0.000	0.000	0.000	
718.00	0.9	43.5	17.7	0.0000	0.000	0.000	0.000	
719.00	0.9	44.3	17.6	0.0000	0.000	0.000	0.000	
720.00	1.2	33.9	18.2	0.5080	0.713	3.063	0.440	
721.00	1.2	40.4	17.9	0.0000	0.000	0.000	0.000	
722.00	1.0	42.2	17.8	0.0000	0.000	0.000	0.000	
723.00	1.0	43.0	17.8	0.0000	0.000	0.000	0.000	
724.00	0.9	43.8	17.8	0.0000	0.000	0.000	0.000	
725.00	0.9	33.3	18.0	0.0000	0.000	0.000	0.000	
726.00	1.2	37.4	18.0	0.5080	0.713	3.080	0.443	
727.00	1.0	41.4	17.9	0.0000	0.000	0.000	0.000	
728.00	1.0	42.4	17.8	0.0000	0.000	0.000	0.000	
729.00	0.9	43.2	17.7	0.0000	0.000	0.000	0.000	
730.00	0.8	44.0	17.8	0.0000	0.000	0.000	0.000	
731.00	0.9	32.4	18.0	0.0000	0.000	0.000	0.000	
732.00	1.1	39.1	17.9	0.3810	0.617	2.675	0.384	
733.00	1.0	41.7	17.8	0.0000	0.000	0.000	0.000	
734.00	0.9	42.6	17.8	0.0000	0.000	0.000	0.000	
735.00	0.8	43.3	17.8	0.0000	0.000	0.000	0.000	
736.00	0.7	44.1	17.8	0.0000	0.000	0.000	0.000	
737.00	1.0	33.6	18.1	0.0000	0.000	0.000	0.000	
738.00	1.0	40.4	17.9	0.0000	0.000	0.000	0.000	
739.00	0.9	42.1	17.8	0.0000	0.000	0.000	0.000	
740.00	0.8	42.9	17.8	0.0000	0.000	0.000	0.000	
741.00	0.7	43.7	17.8	0.0000	0.000	0.000	0.000	
742.00	0.7	33.8	17.8	0.0000	0.000	0.000	0.000	
743.00	1.0	37.3	18.0	0.5080	0.713	3.079	0.443	
744.00	0.9	41.3	17.9	0.0000	0.000	0.000	0.000	
745.00	0.8	42.4	17.8	0.0000	0.000	0.000	0.000	
746.00	0.7	43.2	17.8	0.0000	0.000	0.000	0.000	
747.00	0.6	43.9	17.8	0.0000	0.000	0.000	0.000	
748.00	0.7	32.6	18.0	0.0000	0.000	0.000	0.000	
749.00	0.9	39.0	18.0	0.5080	0.713	3.088	0.444	
750.00	0.8	41.7	17.9	0.0000	0.000	0.000	0.000	
751.00	0.7	42.6	17.8	0.0000	0.000	0.000	0.000	
752.00	0.6	43.3	17.8	0.0000	0.000	0.000	0.000	
753.00	0.5	44.1	17.8	0.0000	0.000	0.000	0.000	
754.00	0.9	33.7	18.1	0.3810	0.617	2.651	0.381	
755.00	0.8	40.4	17.9	0.0000	0.000	0.000	0.000	
756.00	0.7	42.0	17.8	0.0000	0.000	0.000	0.000	
757.00	0.6	42.8	17.8	0.0000	0.000	0.000	0.000	
758.00	0.5	43.5	17.8	0.0000	0.000	0.000	0.000	
759.00	0.5	36.9	17.6	0.0000	0.000	0.000	0.000	
760.00	0.8	35.7	18.0	0.5080	0.713	3.072	0.441	
761.00	0.7	40.8	17.9	0.0000	0.000	0.000	0.000	
762.00	0.6	42.1	17.8	0.0000	0.000	0.000	0.000	
763.00	0.5	43.0	17.8	0.0000	0.000	0.000	0.000	
764.00	0.5	43.7	17.8	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 19 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
765.00	0.5	34.0	17.9	0.0000	0.000	0.000	0.000	
766.00	0.8	37.1	18.0	0.5080	0.713	3.078	0.442	
767.00	0.7	41.3	17.9	0.0000	0.000	0.000	0.000	
768.00	0.6	42.3	17.9	0.0000	0.000	0.000	0.000	
769.00	0.5	43.1	17.8	0.0000	0.000	0.000	0.000	
770.00	0.4	43.8	17.8	0.0000	0.000	0.000	0.000	
771.00	0.5	33.3	17.9	0.0000	0.000	0.000	0.000	
772.00	0.7	37.8	18.0	0.5080	0.713	3.082	0.443	
773.00	0.6	41.3	17.9	0.0000	0.000	0.000	0.000	
774.00	0.5	42.4	17.9	0.0000	0.000	0.000	0.000	
775.00	0.4	43.2	17.9	0.0000	0.000	0.000	0.000	
776.00	0.3	43.8	17.9	0.0000	0.000	0.000	0.000	
777.00	0.5	32.4	18.1	0.0000	0.000	0.000	0.000	
778.00	0.6	39.2	18.0	0.5080	0.713	3.089	0.444	
779.00	0.5	41.7	17.9	0.0000	0.000	0.000	0.000	
780.00	0.4	42.6	17.9	0.0000	0.000	0.000	0.000	
781.00	0.3	43.3	17.8	0.0000	0.000	0.000	0.000	
782.00	0.3	44.0	17.8	0.0000	0.000	0.000	0.000	
783.00	0.6	32.4	18.4	0.0000	0.000	0.000	0.000	
784.00	0.6	39.7	18.0	0.0000	0.000	0.000	0.000	
785.00	0.5	41.7	17.9	0.0000	0.000	0.000	0.000	
786.00	0.4	42.8	17.8	0.0000	0.000	0.000	0.000	
787.00	0.3	43.4	17.9	0.0000	0.000	0.000	0.000	
788.00	0.2	44.0	17.8	0.0000	0.000	0.000	0.000	
789.00	0.6	32.9	18.2	0.0000	0.000	0.000	0.000	
790.00	0.5	40.1	18.0	0.0000	0.000	0.000	0.000	
791.00	0.4	41.8	17.9	0.0000	0.000	0.000	0.000	
792.00	0.3	42.7	17.9	0.0000	0.000	0.000	0.000	
793.00	0.2	43.3	17.8	0.0000	0.000	0.000	0.000	
794.00	0.1	44.1	17.8	0.0000	0.000	0.000	0.000	
795.00	0.5	32.9	18.2	0.0000	0.000	0.000	0.000	
796.00	0.4	40.0	18.0	0.0000	0.000	0.000	0.000	
797.00	0.3	41.8	17.9	0.0000	0.000	0.000	0.000	
798.00	0.3	42.6	17.8	0.0000	0.000	0.000	0.000	
799.00	0.2	43.3	17.8	0.0000	0.000	0.000	0.000	
800.00	0.1	43.9	17.8	0.0000	0.000	0.000	0.000	
801.00	0.5	32.5	18.3	0.5080	0.713	3.056	0.439	
802.00	0.4	39.7	18.0	0.0000	0.000	0.000	0.000	
803.00	0.3	41.7	17.9	0.0000	0.000	0.000	0.000	
804.00	0.2	42.5	17.9	0.0000	0.000	0.000	0.000	
805.00	0.1	43.3	17.8	0.0000	0.000	0.000	0.000	
806.00	0.1	43.7	17.8	0.0000	0.000	0.000	0.000	
807.00	0.2	32.6	18.1	0.0000	0.000	0.000	0.000	
808.00	0.4	38.6	18.0	0.5080	0.713	3.086	0.443	
809.00	0.3	41.4	18.0	0.0000	0.000	0.000	0.000	
810.00	0.2	42.3	17.9	0.0000	0.000	0.000	0.000	
811.00	0.1	43.0	17.9	0.0000	0.000	0.000	0.000	
812.00	0.0	43.7	17.8	0.0000	0.000	0.000	0.000	
813.00	0.1	33.5	18.0	0.0000	0.000	0.000	0.000	
814.00	0.3	37.3	18.0	0.5080	0.713	3.079	0.443	
815.00	0.3	41.0	18.0	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 20 of 136)

Use "X" to Sele

	Humidity	Temp. C	kg H_2O/kg air
	10%	23.4	0.002
Total Output	184287	KJ	(from Psychro.Chart)
Total Input	284886	KJ	
EFFIC.	**64.7%**		

Baro	Duct S.P.	Duct Abs.P
30.15	0.20	30.16
in Hg	in H_2O	in Hg

Pitot Trave
1.0
9 Point
16 Point
Round

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec	Volumetric Flow M^3/sec	EMPTY
816.00	0.2	42.1	17.9	0.0000	0.000	0.000	0.000	
817.00	0.1	42.8	17.9	0.0000	0.000	0.000	0.000	
818.00	0.0	43.4	17.8	0.0000	0.000	0.000	0.000	
819.00	-0.1	43.7	17.6	0.0000	0.000	0.000	0.000	
820.00	0.3	34.4	18.1	0.5080	0.713	3.065	0.440	
821.00	0.2	40.1	18.0	0.0000	0.000	0.000	0.000	
822.00	0.1	41.6	17.9	0.0000	0.000	0.000	0.000	
823.00	0.0	42.4	17.9	0.0000	0.000	0.000	0.000	
824.00	0.0	43.1	17.9	0.0000	0.000	0.000	0.000	
825.00	-0.1	43.5	17.9	0.0000	0.000	0.000	0.000	
826.00	0.0	33.3	18.0	0.0000	0.000	0.000	0.000	
827.00	0.2	37.2	18.0	0.5080	0.713	3.079	0.442	
828.00	0.1	40.9	17.9	0.0000	0.000	0.000	0.000	
829.00	0.1	41.9	17.9	0.0000	0.000	0.000	0.000	
830.00	0.0	40.6	17.9	0.0000	0.000	0.000	0.000	

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 21 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
0.00	1.9	27.36	52	49	0	0	0	0
1.00	1786.0	17.31	30,914	29,320	333	333	**19,967**	18,938
2.00	1793.4	19.82	35,544	33,712	554	887	**26,596**	25,225
3.00	1.9	27.85	53	50	357	1,243	**24,862**	23,581
4.00	1.9	21.45	40	38	1	1,244	**18,658**	17,697
5.00	1919.4	20.51	39,365	37,336	336	1,580	**18,958**	17,980
6.00	1914.9	19.55	37,431	35,502	640	2,220	**22,197**	21,053
7.00	1787.2	17.74	31,708	30,073	575	2,795	**23,957**	22,722
8.00	1783.9	16.67	29,732	28,199	512	3,307	**24,802**	23,523
9.00	1781.3	15.15	26,983	25,592	473	3,780	**25,197**	23,898
10.00	1916.2	19.57	37,504	35,571	535	4,314	**25,887**	24,552
11.00	1.9	25.12	47	45	357	4,672	**25,482**	24,168
12.00	1.9	23.65	45	42	1	4,672	**23,362**	22,158
13.00	1783.6	16.76	29,892	28,351	301	4,973	**22,953**	21,769
14.00	1780.8	15.71	27,973	26,531	482	5,455	**23,380**	22,174
15.00	1925.8	23.01	44,320	42,036	598	6,053	**24,213**	22,965
16.00	1.9	27.39	52	49	405	6,458	**24,218**	22,969
17.00	1.9	17.89	34	32	1	6,459	**22,796**	21,621
18.00	1783.0	16.49	29,397	27,882	256	6,714	**22,381**	21,228
19.00	1903.3	15.64	29,764	28,230	493	7,208	**22,762**	21,588
20.00	1919.4	20.54	39,424	37,392	576	7,784	**23,352**	22,149
21.00	1.9	25.97	49	46	372	8,156	**23,304**	22,103
22.00	1.9	18.30	35	33	1	8,157	**22,247**	21,100
23.00	1782.1	16.27	29,000	27,505	257	8,414	**21,950**	20,818
24.00	1902.3	15.14	28,803	27,318	482	8,896	**22,241**	21,094
25.00	1.9	23.15	44	41	304	9,200	**22,080**	20,942
26.00	1.9	26.54	50	47	1	9,201	**21,233**	20,138
27.00	1.9	17.66	33	32	1	9,202	**20,448**	19,394
28.00	1780.3	15.48	27,553	26,133	246	9,448	**20,245**	19,202
29.00	1921.1	21.53	41,361	39,229	571	10,018	**20,728**	19,659
30.00	1.9	26.62	50	48	386	10,404	**20,809**	19,736
31.00	1.9	19.26	36	34	1	10,405	**20,139**	19,101
32.00	1908.5	17.32	33,048	31,344	291	10,696	**20,055**	19,021
33.00	1906.2	16.78	31,991	30,341	542	11,238	**20,433**	19,380
34.00	1905.0	15.98	30,449	28,880	520	11,758	**20,750**	19,681
35.00	1904.7	16.12	30,697	29,115	510	12,268	**21,031**	19,947
36.00	1904.7	15.75	29,995	28,449	506	12,774	**21,290**	20,192
37.00	1904.6	15.91	30,301	28,739	502	13,276	**21,529**	20,419
38.00	1904.2	16.05	30,554	28,979	507	13,783	**21,763**	20,641
39.00	1904.1	15.63	29,757	28,223	503	14,286	**21,978**	20,845
40.00	1904.0	15.74	29,979	28,433	498	14,784	**22,176**	21,033
41.00	1904.6	15.82	30,132	28,579	501	15,285	**22,368**	21,215
42.00	1904.7	15.96	30,407	28,840	504	15,789	**22,556**	21,393
43.00	1905.5	15.57	29,678	28,148	501	16,290	**22,730**	21,558
44.00	1905.5	15.95	30,387	28,821	501	16,790	**22,896**	21,716
45.00	1905.2	15.72	29,959	28,414	503	17,293	**23,058**	21,869
46.00	1905.2	16.20	30,867	29,276	507	17,800	**23,218**	22,021
47.00	1905.5	16.10	30,686	29,104	513	18,313	**23,378**	22,173
48.00	1905.8	16.16	30,796	29,208	512	18,825	**23,532**	22,319
49.00	1904.9	16.29	31,037	29,437	515	19,341	**23,683**	22,462
50.00	1905.0	16.25	30,955	29,359	517	19,857	**23,829**	22,600

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 22 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
51.00	1905.1	15.91	30,307	28,745	511	20,368	**23,962**	22,727
52.00	1904.7	15.99	30,462	28,892	506	20,874	**24,086**	22,844
53.00	1904.4	16.07	30,610	29,033	509	21,383	**24,207**	22,960
54.00	1903.7	15.82	30,126	28,573	506	21,889	**24,321**	23,068
55.00	1903.4	15.30	29,118	27,617	494	22,383	**24,418**	23,159
56.00	1903.3	15.35	29,221	27,715	486	22,869	**24,503**	23,240
57.00	1903.0	15.22	28,956	27,463	485	23,354	**24,583**	23,316
58.00	1902.4	15.06	28,641	27,165	480	23,834	**24,656**	23,385
59.00	1902.1	15.25	28,999	27,504	480	24,314	**24,726**	23,452
60.00	1901.9	14.90	28,334	26,873	478	24,792	**24,792**	23,514
61.00	1901.7	14.86	28,255	26,799	472	25,264	**24,850**	23,569
62.00	1901.2	14.64	27,840	26,405	467	25,731	**24,901**	23,617
63.00	1901.2	14.69	27,933	26,493	465	26,196	**24,948**	23,662
64.00	1900.8	14.58	27,717	26,289	464	26,660	**24,993**	23,705
65.00	1900.9	14.46	27,486	26,069	460	27,120	**25,034**	23,743
66.00	1900.7	14.59	27,738	26,308	460	27,580	**25,073**	23,780
67.00	1900.8	14.70	27,946	26,505	464	28,044	**25,114**	23,819
68.00	1900.5	14.52	27,599	26,177	463	28,507	**25,153**	23,856
69.00	1900.9	14.53	27,629	26,204	460	28,967	**25,189**	23,890
70.00	1901.2	14.72	27,983	26,541	463	29,430	**25,226**	23,926
71.00	1901.1	14.79	28,123	26,673	468	29,898	**25,266**	23,963
72.00	1901.0	14.69	27,924	26,485	467	30,365	**25,304**	24,000
73.00	1901.5	14.76	28,061	26,614	467	30,832	**25,341**	24,035
74.00	1901.8	14.87	28,278	26,820	469	31,301	**25,379**	24,071
75.00	1901.7	15.02	28,571	27,099	474	31,775	**25,420**	24,110
76.00	1902.1	15.11	28,733	27,252	478	32,252	**25,462**	24,150
77.00	1902.5	15.11	28,752	27,270	479	32,731	**25,505**	24,190
78.00	1902.5	15.16	28,839	27,352	480	33,211	**25,547**	24,230
79.00	1902.7	15.15	28,819	27,334	480	33,692	**25,589**	24,270
80.00	1902.8	15.28	29,076	27,577	482	34,174	**25,631**	24,309
81.00	1903.2	15.49	29,488	27,968	488	34,662	**25,676**	24,352
82.00	1903.6	15.26	29,049	27,552	488	35,150	**25,720**	24,394
83.00	1904.0	15.32	29,172	27,668	485	35,635	**25,760**	24,433
84.00	1903.9	15.41	29,333	27,821	488	36,123	**25,802**	24,472
85.00	1904.4	15.74	29,968	28,423	494	36,617	**25,847**	24,515
86.00	1904.3	15.65	29,795	28,259	498	37,115	**25,894**	24,559
87.00	1904.4	15.72	29,941	28,397	498	37,613	**25,940**	24,603
88.00	1904.8	15.45	29,421	27,905	495	38,108	**25,982**	24,643
89.00	1904.3	15.62	29,751	28,217	493	38,601	**26,023**	24,681
90.00	1904.3	15.41	29,351	27,838	493	39,093	**26,062**	24,719
91.00	1904.2	15.51	29,541	28,018	491	39,584	**26,099**	24,754
92.00	1904.0	15.26	29,057	27,559	488	40,072	**26,134**	24,787
93.00	1903.6	15.24	29,005	27,510	484	40,556	**26,165**	24,816
94.00	1903.4	15.17	28,883	27,395	482	41,038	**26,195**	24,844
95.00	1902.8	14.97	28,491	27,023	478	41,517	**26,221**	24,869
96.00	1903.0	14.89	28,331	26,871	474	41,990	**26,244**	24,891
97.00	1902.2	14.97	28,478	27,010	473	42,464	**26,266**	24,912
98.00	1902.0	14.70	27,969	26,527	470	42,934	**26,286**	24,931
99.00	1902.2	14.63	27,824	26,390	465	43,399	**26,302**	24,946
100.00	1901.8	14.75	28,058	26,611	466	43,865	**26,319**	24,962
101.00	1901.5	14.45	27,484	26,067	463	44,327	**26,333**	24,976

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 23 of 136)

ect Duct Traverse Type

				Test Category (1, 2, 3, 4)	1			
	rse Factor	Pitot F.	Duct area	Air Density @				Rated Capacity
	478	0.99	0.1437	STP				Cat 3
Total Output				1.204	kg/m³			Cat 2
Total Input	X							Cat 1
EFFIC.								

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
102.00	1900.9	14.41	27,383	25,971	457	44,785	**26,344**	24,986
103.00	1900.8	14.46	27,495	26,078	457	45,242	**26,355**	24,996
104.00	1900.3	14.32	27,217	25,814	456	45,698	**26,364**	25,005
105.00	1900.4	14.33	27,231	25,827	454	46,152	**26,372**	25,013
106.00	1900.3	14.21	27,001	25,609	452	46,604	**26,379**	25,020
107.00	1900.3	14.27	27,108	25,711	451	47,054	**26,386**	25,026
108.00	1900.1	14.31	27,199	25,797	453	47,507	**26,393**	25,032
109.00	1899.9	14.14	26,857	25,473	450	47,957	**26,399**	25,038
110.00	1900.1	13.95	26,511	25,144	445	48,402	**26,401**	25,040
111.00	1900.0	14.23	27,038	25,644	446	48,848	**26,405**	25,043
112.00	1899.7	14.05	26,682	25,307	448	49,296	**26,409**	25,047
113.00	1899.6	14.12	26,820	25,437	446	49,742	**26,412**	25,050
114.00	1899.9	14.17	26,914	25,527	448	50,190	**26,416**	25,054
115.00	1899.7	14.16	26,903	25,516	448	50,638	**26,420**	25,058
116.00	1900.0	13.94	26,486	25,121	445	51,083	**26,422**	25,060
117.00	1899.6	14.04	26,680	25,304	443	51,526	**26,424**	25,062
118.00	1900.1	13.88	26,375	25,015	442	51,968	**26,425**	25,062
119.00	1899.8	14.15	26,880	25,495	444	52,412	**26,426**	25,064
120.00	1899.9	14.12	26,836	25,453	448	52,860	**26,430**	25,067
121.00	1900.2	14.02	26,637	25,264	446	53,305	**26,432**	25,070
122.00	1900.6	13.87	26,360	25,001	442	53,747	**26,433**	25,070
123.00	1900.1	14.05	26,696	25,320	442	54,189	**26,434**	25,071
124.00	1900.4	14.29	27,160	25,760	449	54,638	**26,438**	25,075
125.00	1900.4	14.16	26,917	25,530	451	55,089	**26,443**	25,079
126.00	1900.3	14.25	27,072	25,677	450	55,538	**26,447**	25,084
127.00	1900.3	13.95	26,515	25,148	447	55,985	**26,450**	25,086
128.00	1900.5	14.32	27,223	25,820	448	56,433	**26,453**	25,089
129.00	1901.1	14.25	27,096	25,699	453	56,886	**26,458**	25,094
130.00	1901.0	14.47	27,504	26,086	455	57,341	**26,465**	25,101
131.00	1901.5	14.46	27,497	26,080	458	57,799	**26,473**	25,108
132.00	1901.8	14.62	27,797	26,364	461	58,260	**26,482**	25,117
133.00	1902.1	14.53	27,648	26,222	462	58,722	**26,491**	25,125
134.00	1902.1	14.85	28,242	26,786	466	59,187	**26,502**	25,136
135.00	1902.9	15.04	28,615	27,140	474	59,661	**26,516**	25,149
136.00	1903.1	14.89	28,335	26,875	475	60,136	**26,531**	25,163
137.00	1903.4	14.83	28,224	26,769	471	60,607	**26,543**	25,175
138.00	1903.6	15.11	28,764	27,281	475	61,082	**26,557**	25,188
139.00	1903.9	15.35	29,227	27,721	483	61,565	**26,575**	25,205
140.00	1904.2	14.93	28,434	26,969	481	62,046	**26,591**	25,220
141.00	1904.3	15.49	29,505	27,984	483	62,529	**26,608**	25,236
142.00	1904.2	15.44	29,399	27,883	491	63,020	**26,628**	25,255
143.00	1903.7	15.37	29,267	27,759	489	63,508	**26,647**	25,273
144.00	1903.8	15.24	29,020	27,524	486	63,994	**26,664**	25,290
145.00	1903.3	15.28	29,078	27,579	484	64,478	**26,681**	25,305
146.00	1903.3	15.05	28,648	27,171	481	64,959	**26,696**	25,320
147.00	1902.9	15.03	28,592	27,118	477	65,436	**26,709**	25,332
148.00	1902.9	14.63	27,847	26,412	470	65,907	**26,719**	25,342
149.00	1902.6	14.93	28,408	26,944	469	66,375	**26,728**	25,351
150.00	1902.5	14.61	27,788	26,355	468	66,844	**26,738**	25,359
151.00	1902.4	14.50	27,593	26,171	462	67,305	**26,744**	25,365
152.00	1902.2	14.68	27,929	26,490	463	67,768	**26,751**	25,372

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 24 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
153.00	1902.2	14.14	26,906	25,519	457	68,225	**26,755**	25,376
154.00	1901.8	14.19	26,990	25,599	449	68,674	**26,756**	25,377
155.00	1901.6	14.31	27,218	25,815	452	69,126	**26,758**	25,379
156.00	1901.9	14.39	27,367	25,957	455	69,581	**26,762**	25,382
157.00	1901.6	14.52	27,614	26,190	458	70,039	**26,766**	25,387
158.00	1901.2	14.42	27,412	25,999	459	70,497	**26,771**	25,391
159.00	1901.5	14.38	27,337	25,928	456	70,954	**26,775**	25,395
160.00	1901.0	14.34	27,264	25,858	455	71,409	**26,778**	25,398
161.00	1901.2	14.43	27,431	26,017	456	71,864	**26,782**	25,401
162.00	1901.2	14.03	26,674	25,299	451	72,315	**26,783**	25,403
163.00	1901.7	13.99	26,601	25,230	444	72,759	**26,783**	25,402
164.00	1901.2	14.23	27,058	25,663	447	73,206	**26,783**	25,402
165.00	1901.1	14.13	26,856	25,472	449	73,656	**26,784**	25,403
166.00	1901.1	14.17	26,937	25,548	448	74,104	**26,785**	25,404
167.00	1901.0	14.20	27,001	25,609	449	74,553	**26,786**	25,405
168.00	1900.7	14.26	27,105	25,707	451	75,004	**26,787**	25,406
169.00	1900.7	14.17	26,928	25,540	450	75,455	**26,789**	25,408
170.00	1900.6	14.10	26,791	25,410	448	75,902	**26,789**	25,408
171.00	1900.5	14.33	27,234	25,830	450	76,352	**26,790**	25,409
172.00	1900.2	14.02	26,644	25,271	449	76,801	**26,791**	25,410
173.00	1900.4	14.07	26,744	25,366	445	77,246	**26,791**	25,410
174.00	1900.5	14.01	26,616	25,244	445	77,691	**26,790**	25,409
175.00	1900.2	14.19	26,971	25,581	447	78,138	**26,790**	25,409
176.00	1900.2	14.05	26,692	25,316	447	78,585	**26,790**	25,409
177.00	1900.1	13.84	26,304	24,948	442	79,026	**26,789**	25,408
178.00	1900.3	13.93	26,472	25,107	440	79,466	**26,786**	25,406
179.00	1900.3	14.22	27,014	25,622	446	79,912	**26,786**	25,405
180.00	1900.6	14.22	27,022	25,629	450	80,362	**26,787**	25,407
181.00	1900.9	14.14	26,885	25,499	449	80,811	**26,788**	25,407
182.00	1900.9	14.08	26,762	25,383	447	81,259	**26,789**	25,408
183.00	1900.8	14.27	27,133	25,734	449	81,708	**26,789**	25,408
184.00	1900.9	14.23	27,049	25,654	452	82,159	**26,791**	25,410
185.00	1901.3	14.29	27,166	25,766	452	82,611	**26,793**	25,412
186.00	1900.8	14.17	26,930	25,542	451	83,062	**26,794**	25,413
187.00	1901.4	14.11	26,831	25,448	448	83,510	**26,795**	25,413
188.00	1901.2	14.12	26,836	25,453	447	83,957	**26,795**	25,414
189.00	1901.5	14.23	27,057	25,662	449	84,406	**26,796**	25,414
190.00	1901.5	14.10	26,819	25,436	449	84,855	**26,796**	25,415
191.00	1901.1	14.34	27,255	25,850	451	85,306	**26,798**	25,416
192.00	1901.3	14.19	26,976	25,585	452	85,758	**26,799**	25,418
193.00	1901.1	14.34	27,263	25,857	452	86,210	**26,801**	25,419
194.00	1901.0	14.23	27,049	25,655	453	86,662	**26,803**	25,421
195.00	1901.0	14.26	27,102	25,705	451	87,113	**26,804**	25,422
196.00	1901.2	14.08	26,776	25,396	449	87,562	**26,805**	25,423
197.00	1901.0	14.06	26,718	25,341	446	88,008	**26,805**	25,423
198.00	1900.7	14.01	26,625	25,253	445	88,453	**26,804**	25,422
199.00	1900.7	13.83	26,281	24,926	441	88,894	**26,802**	25,421
200.00	1901.1	13.82	26,266	24,912	438	89,332	**26,799**	25,418
201.00	1900.9	13.39	25,460	24,148	431	89,763	**26,795**	25,414
202.00	1900.6	13.41	25,492	24,178	425	90,187	**26,788**	25,407
203.00	1910.5	16.96	32,393	30,723	482	90,669	**26,799**	25,417

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 25 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
204.00	1.9	22.90	43	41	318	90,987	**26,761**	25,381
205.00	1.9	17.39	33	31	1	90,988	**26,631**	25,258
206.00	1907.5	15.98	30,482	28,911	266	91,253	**26,579**	25,208
207.00	1905.7	15.27	29,097	27,597	496	91,750	**26,594**	25,223
208.00	1904.2	14.96	28,482	27,014	480	92,229	**26,605**	25,233
209.00	1903.4	14.48	27,566	26,145	467	92,697	**26,611**	25,240
210.00	1902.2	14.28	27,166	25,766	456	93,153	**26,615**	25,243
211.00	1901.9	13.65	25,967	24,628	443	93,595	**26,615**	25,243
212.00	1917.4	18.98	36,384	34,508	519	94,115	**26,636**	25,263
213.00	1.9	24.43	46	44	347	94,462	**26,609**	25,237
214.00	1.9	16.52	31	30	1	94,462	**26,485**	25,120
215.00	1906.9	15.27	29,123	27,622	253	94,715	**26,432**	25,070
216.00	1904.8	14.99	28,560	27,088	481	95,196	**26,443**	25,080
217.00	1903.2	14.53	27,661	26,235	469	95,664	**26,451**	25,087
218.00	1901.9	13.89	26,411	25,050	451	96,115	**26,454**	25,090
219.00	1925.2	21.67	41,725	39,574	567	96,682	**26,488**	25,123
220.00	1.9	26.37	50	47	386	97,068	**26,473**	25,108
221.00	1.9	16.36	31	29	1	97,068	**26,353**	24,995
222.00	1904.9	15.11	28,792	27,308	250	97,319	**26,302**	24,946
223.00	1902.2	14.48	27,537	26,117	469	97,788	**26,311**	24,954
224.00	1923.0	21.15	40,669	38,573	568	98,356	**26,345**	24,987
225.00	1.9	25.24	48	45	372	98,728	**26,327**	24,970
226.00	1.9	16.08	30	29	1	98,728	**26,211**	24,860
227.00	1903.2	14.74	28,047	26,601	245	98,973	**26,160**	24,812
228.00	1916.5	18.95	36,315	34,443	536	99,509	**26,187**	24,837
229.00	1.9	24.32	46	44	346	99,855	**26,163**	24,814
230.00	1.9	18.72	35	34	1	99,856	**26,049**	24,707
231.00	1904.5	15.23	29,001	27,506	270	100,125	**26,007**	24,666
232.00	1916.6	19.04	36,492	34,611	546	100,671	**26,036**	24,693
233.00	1.9	24.56	46	44	349	101,019	**26,014**	24,673
234.00	1.9	22.26	42	40	1	101,020	**25,903**	24,567
235.00	1905.1	15.24	29,043	27,546	298	101,318	**25,868**	24,535
236.00	1918.6	19.65	37,694	35,751	556	101,874	**25,900**	24,565
237.00	1.9	25.15	47	45	358	102,233	**25,882**	24,547
238.00	1.9	19.64	37	35	1	102,233	**25,773**	24,445
239.00	1905.0	14.70	28,007	26,563	273	102,506	**25,734**	24,407
240.00	1920.3	20.16	38,707	36,712	556	103,062	**25,765**	24,437
241.00	1.9	25.03	47	45	362	103,424	**25,749**	24,421
242.00	1.9	18.39	35	33	1	103,424	**25,642**	24,321
243.00	1904.8	15.04	28,647	27,170	266	103,690	**25,602**	24,283
244.00	1922.1	20.78	39,948	37,889	571	104,261	**25,638**	24,316
245.00	1.9	25.40	48	45	370	104,631	**25,624**	24,303
246.00	1.9	21.33	40	38	1	104,632	**25,520**	24,204
247.00	1904.9	15.27	29,089	27,590	291	104,923	**25,487**	24,173
248.00	1922.5	21.02	40,421	38,337	579	105,502	**25,525**	24,209
249.00	1.9	25.50	48	46	373	105,875	**25,512**	24,197
250.00	1.9	19.15	36	34	1	105,875	**25,410**	24,100
251.00	1904.8	14.87	28,323	26,863	270	106,146	**25,373**	24,066
252.00	1923.8	21.23	40,838	38,733	576	106,721	**25,410**	24,100
253.00	1.9	25.39	48	45	374	107,096	**25,398**	24,089
254.00	1.9	20.99	40	38	1	107,096	**25,298**	23,994

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 26 of 136)

ect Duct Traverse Type

				Test Category (1, 2, 3, 4)	1			
	rse Factor	Pitot F.	Duct area	Air Density @				Rated Capacity
	478	0.99	0.1437	STP				Cat 3
Total Output				1.204	kg/m³			Cat 2
Total Input	X							Cat 1
EFFIC.								

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
255.00	1904.9	15.11	28,774	27,291	287	107,383	**25,267**	23,964
256.00	1925.6	21.94	42,243	40,065	591	107,974	**25,306**	24,002
257.00	1.9	25.77	49	46	383	108,357	**25,297**	23,993
258.00	1.9	18.18	34	33	1	108,358	**25,200**	23,901
259.00	1904.2	14.57	27,738	26,308	260	108,618	**25,163**	23,865
260.00	1.9	22.08	42	40	291	108,909	**25,133**	23,837
261.00	1.9	25.69	48	46	1	108,910	**25,037**	23,746
262.00	1.9	18.07	34	32	1	108,911	**24,941**	23,656
263.00	1905.5	14.98	28,548	27,077	263	109,173	**24,906**	23,623
264.00	1.9	23.35	44	42	305	109,478	**24,881**	23,599
265.00	1.9	26.44	50	47	1	109,479	**24,788**	23,510
266.00	1.9	16.68	31	30	1	109,479	**24,695**	23,422
267.00	1907.1	15.62	29,797	28,261	257	109,736	**24,660**	23,389
268.00	1.9	23.82	45	43	314	110,050	**24,638**	23,368
269.00	1.9	26.34	50	47	1	110,051	**24,547**	23,281
270.00	1.9	16.97	32	30	1	110,052	**24,456**	23,195
271.00	1907.5	15.71	29,960	28,416	260	110,312	**24,423**	23,164
272.00	1.9	23.69	45	42	313	110,625	**24,403**	23,145
273.00	1.9	26.38	50	47	1	110,626	**24,313**	23,060
274.00	1.9	16.57	31	30	1	110,626	**24,225**	22,976
275.00	1909.5	16.46	31,424	29,804	263	110,890	**24,194**	22,947
276.00	1.9	24.00	45	43	322	111,212	**24,176**	22,930
277.00	1.9	26.58	50	48	1	111,213	**24,089**	22,848
278.00	1.9	16.79	32	30	1	111,213	**24,003**	22,766
279.00	1908.7	16.07	30,674	29,093	262	111,475	**23,973**	22,737
280.00	1.9	23.69	45	42	317	111,791	**23,955**	22,720
281.00	1.9	26.44	50	47	1	111,792	**23,870**	22,640
282.00	1.9	16.14	30	29	1	111,793	**23,786**	22,560
283.00	1912.9	17.41	33,302	31,585	268	112,060	**23,758**	22,534
284.00	1.9	24.27	46	43	333	112,393	**23,745**	22,521
285.00	1.9	26.85	51	48	1	112,394	**23,662**	22,442
286.00	1.9	16.10	30	29	1	112,395	**23,579**	22,364
287.00	1913.1	17.62	33,709	31,971	269	112,664	**23,553**	22,339
288.00	1.9	24.31	46	44	335	112,998	**23,541**	22,328
289.00	1.9	26.85	51	48	1	112,999	**23,460**	22,251
290.00	1.9	15.87	30	28	1	113,000	**23,379**	22,174
291.00	1914.8	18.29	35,028	33,222	273	113,273	**23,355**	22,151
292.00	1.9	24.49	46	44	342	113,614	**23,345**	22,142
293.00	1.9	26.85	51	48	1	113,615	**23,266**	22,067
294.00	1.9	15.44	29	28	1	113,616	**23,187**	21,992
295.00	1916.5	18.81	36,052	34,193	274	113,889	**23,164**	21,970
296.00	1.9	24.67	47	44	348	114,237	**23,156**	21,962
297.00	1.9	26.94	51	48	1	114,238	**23,078**	21,889
298.00	1.9	15.75	30	28	1	114,238	**23,001**	21,815
299.00	1916.6	18.72	35,887	34,037	276	114,514	**22,979**	21,795
300.00	1.9	24.60	46	44	346	114,860	**22,972**	21,788
301.00	1.9	26.84	51	48	1	114,861	**22,896**	21,716
302.00	1.9	15.53	29	28	1	114,862	**22,820**	21,644
303.00	2347.8	19.01	44,623	42,323	338	115,200	**22,812**	21,636
304.00	1.9	24.57	46	44	427	115,627	**22,821**	21,645
305.00	1.9	26.82	51	48	1	115,627	**22,746**	21,574

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 27 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
306.00	1.9	16.00	30	29	1	115,628	**22,672**	21,503
307.00	1915.8	18.63	35,695	33,855	277	115,905	**22,652**	21,485
308.00	1.9	24.64	46	44	346	116,251	**22,646**	21,479
309.00	1.9	26.54	50	47	1	116,251	**22,573**	21,409
310.00	1.9	16.20	31	29	1	116,252	**22,500**	21,341
311.00	1917.0	18.98	36,379	34,503	281	116,533	**22,482**	21,323
312.00	1.9	24.74	47	44	350	116,883	**22,477**	21,319
313.00	1.9	26.78	51	48	1	116,884	**22,406**	21,251
314.00	1.9	16.01	30	29	1	116,884	**22,335**	21,183
315.00	1915.5	18.47	35,375	33,551	275	117,160	**22,316**	21,166
316.00	1.9	24.39	46	44	342	117,502	**22,311**	21,160
317.00	1.9	26.46	50	47	1	117,503	**22,240**	21,094
318.00	1.9	16.33	31	29	1	117,503	**22,170**	21,028
319.00	1912.2	17.20	32,881	31,186	267	117,771	**22,151**	21,009
320.00	1.9	23.98	45	43	328	118,099	**22,144**	21,002
321.00	1.9	26.21	49	47	1	118,100	**22,075**	20,937
322.00	1.9	17.05	32	31	1	118,101	**22,006**	20,872
323.00	1907.8	15.67	29,895	28,354	260	118,361	**21,987**	20,853
324.00	1.9	23.42	44	42	311	118,672	**21,976**	20,843
325.00	1.9	25.92	49	46	1	118,673	**21,909**	20,779
326.00	1.9	19.35	36	35	1	118,674	**21,842**	20,716
327.00	1904.6	14.57	27,745	26,315	269	118,943	**21,824**	20,699
328.00	1.9	22.86	43	41	297	119,240	**21,812**	20,688
329.00	1.9	25.87	49	46	1	119,241	**21,746**	20,625
330.00	1.9	30.15	57	54	1	119,242	**21,680**	20,563
331.00	2129.8	14.66	31,222	29,613	398	119,640	**21,687**	20,569
332.00	1926.3	21.90	42,191	40,016	618	120,258	**21,733**	20,613
333.00	1.9	25.53	48	46	381	120,639	**21,737**	20,616
334.00	1.9	27.26	51	49	1	120,640	**21,672**	20,555
335.00	1.9	15.21	29	27	1	120,641	**21,607**	20,493
336.00	1922.7	20.74	39,877	37,821	288	120,929	**21,594**	20,481
337.00	1.9	25.01	47	45	367	121,296	**21,596**	20,482
338.00	1.9	26.93	51	48	1	121,297	**21,532**	20,422
339.00	1.9	15.25	29	27	1	121,297	**21,469**	20,362
340.00	1.9	19.94	38	36	1	121,298	**21,405**	20,302
341.00	1.9	24.76	47	44	1	121,298	**21,343**	20,243
342.00	1.9	26.74	50	48	1	121,299	**21,281**	20,184
343.00	1.9	16.72	32	30	1	121,300	**21,219**	20,125
344.00	1913.8	17.79	34,041	32,287	275	121,575	**21,205**	20,112
345.00	1.9	24.27	46	43	336	121,911	**21,202**	20,109
346.00	1.9	26.42	50	47	1	121,912	**21,141**	20,051
347.00	1.9	17.92	34	32	1	121,913	**21,080**	19,993
348.00	1907.4	15.63	29,806	28,269	267	122,179	**21,065**	19,980
349.00	1.9	23.49	44	42	311	122,491	**21,059**	19,973
350.00	1.9	25.89	49	46	1	122,491	**20,999**	19,916
351.00	1.9	29.03	55	52	1	122,492	**20,939**	19,859
352.00	1904.7	14.79	28,164	26,712	348	122,840	**20,939**	19,859
353.00	1927.1	22.21	42,803	40,597	591	123,431	**20,980**	19,898
354.00	1.9	25.45	48	46	383	123,814	**20,985**	19,904
355.00	1.9	26.98	51	48	1	123,815	**20,926**	19,848
356.00	1.9	15.19	29	27	1	123,816	**20,868**	19,792

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 28 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
357.00	1922.8	20.82	40,028	37,964	289	124,104	**20,858**	19,783
358.00	1.9	25.08	47	45	368	124,472	**20,861**	19,786
359.00	1.9	26.93	51	48	1	124,473	**20,803**	19,731
360.00	1.9	15.50	29	28	1	124,474	**20,746**	19,676
361.00	1919.9	19.77	37,965	36,008	282	124,756	**20,735**	19,666
362.00	1.9	24.68	47	44	356	125,112	**20,737**	19,668
363.00	1.9	26.64	50	48	1	125,113	**20,680**	19,614
364.00	1.9	17.24	33	31	1	125,114	**20,623**	19,560
365.00	1910.1	16.47	31,455	29,834	269	125,382	**20,611**	19,548
366.00	1.9	23.74	45	42	320	125,703	**20,607**	19,545
367.00	1.9	25.95	49	46	1	125,703	**20,551**	19,492
368.00	1.9	30.14	57	54	1	125,704	**20,495**	19,439
369.00	1905.0	14.72	28,034	26,589	356	126,061	**20,498**	19,441
370.00	1.9	22.46	42	40	295	126,356	**20,490**	19,434
371.00	1.9	25.56	48	46	1	126,357	**20,435**	19,382
372.00	1.9	27.24	51	49	1	126,358	**20,380**	19,330
373.00	1.9	15.05	28	27	1	126,358	**20,326**	19,278
374.00	1924.2	21.34	41,055	38,939	292	126,650	**20,318**	19,271
375.00	1.9	25.30	48	45	374	127,025	**20,324**	19,276
376.00	1.9	27.04	51	48	1	127,025	**20,270**	19,225
377.00	1.9	16.14	30	29	1	127,026	**20,216**	19,174
378.00	1918.0	19.21	36,843	34,944	283	127,309	**20,208**	19,166
379.00	1.9	24.68	47	44	351	127,660	**20,210**	19,168
380.00	1.9	26.52	50	47	1	127,661	**20,157**	19,118
381.00	1.9	16.85	32	30	1	127,661	**20,104**	19,068
382.00	1915.1	18.17	34,799	33,005	280	127,941	**20,095**	19,060
383.00	1.9	24.29	46	43	339	128,280	**20,096**	19,060
384.00	1.9	26.39	50	47	1	128,281	**20,044**	19,011
385.00	1.9	19.12	36	34	1	128,282	**19,992**	18,961
386.00	1908.8	16.26	31,043	29,442	282	128,563	**19,984**	18,954
387.00	1.9	24.03	45	43	321	128,884	**19,982**	18,952
388.00	1.9	26.17	49	47	1	128,885	**19,931**	18,903
389.00	1.9	27.81	52	50	1	128,886	**19,880**	18,855
390.00	1904.5	15.05	28,665	27,187	340	129,226	**19,881**	18,856
391.00	1926.7	22.29	42,953	40,739	596	129,822	**19,922**	18,895
392.00	1.9	25.53	48	46	384	130,207	**19,930**	18,902
393.00	1.9	27.14	51	49	1	130,208	**19,879**	18,854
394.00	1.9	15.61	29	28	1	130,208	**19,829**	18,807
395.00	1920.6	20.24	38,865	36,862	287	130,495	**19,822**	18,800
396.00	1.9	24.91	47	45	362	130,857	**19,827**	18,805
397.00	1.9	26.72	50	48	1	130,858	**19,777**	18,758
398.00	1.9	17.35	33	31	1	130,858	**19,727**	18,710
399.00	1913.3	17.75	33,958	32,207	280	131,139	**19,720**	18,704
400.00	1.9	24.37	46	44	336	131,475	**19,721**	18,705
401.00	1.9	26.36	50	47	1	131,475	**19,672**	18,658
402.00	1.9	20.05	38	36	1	131,476	**19,623**	18,612
403.00	1908.0	15.89	30,315	28,752	286	131,762	**19,617**	18,606
404.00	1.9	23.68	45	42	315	132,077	**19,615**	18,604
405.00	1.9	26.04	49	47	1	132,078	**19,567**	18,558
406.00	1.9	27.52	52	49	1	132,079	**19,519**	18,513
407.00	1.9	14.98	28	27	1	132,079	**19,471**	18,467

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 29 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
408.00	1925.6	21.93	42,221	40,045	296	132,376	**19,467**	18,464
409.00	1.9	25.45	48	46	380	132,756	**19,475**	18,471
410.00	1.9	26.99	51	48	1	132,757	**19,428**	18,426
411.00	1.9	16.02	30	29	1	132,758	**19,381**	18,382
412.00	1918.0	19.46	37,317	35,394	284	133,042	**19,375**	18,376
413.00	1.9	24.60	46	44	352	133,394	**19,379**	18,380
414.00	1.9	26.46	50	47	1	133,395	**19,333**	18,336
415.00	1.9	18.19	34	33	1	133,395	**19,286**	18,292
416.00	1910.5	16.78	32,055	30,403	279	133,674	**19,280**	18,286
417.00	1.9	23.97	45	43	325	133,999	**19,280**	18,287
418.00	1.9	26.03	49	47	1	134,000	**19,234**	18,243
419.00	1.9	29.83	56	53	1	134,001	**19,189**	18,199
420.00	1904.1	14.32	27,265	25,859	351	134,351	**19,193**	18,204
421.00	1.9	22.88	43	41	295	134,647	**19,190**	18,200
422.00	1.9	25.58	48	46	1	134,647	**19,144**	18,157
423.00	1.9	27.17	51	49	1	134,648	**19,099**	18,115
424.00	1.9	15.37	29	27	1	134,649	**19,054**	18,072
425.00	1924.2	21.40	41,183	39,060	295	134,944	**19,051**	18,069
426.00	1.9	25.23	48	45	374	135,318	**19,059**	18,076
427.00	1.9	26.87	51	48	1	135,319	**19,014**	18,034
428.00	1.9	16.10	30	29	1	135,320	**18,970**	17,992
429.00	1919.4	19.75	37,900	35,946	287	135,607	**18,966**	17,988
430.00	1.9	24.74	47	44	356	135,963	**18,972**	17,994
431.00	1.9	26.47	50	47	1	135,964	**18,928**	17,952
432.00	1.9	17.31	33	31	1	135,964	**18,884**	17,910
433.00	1913.2	17.65	33,763	32,022	279	136,243	**18,879**	17,906
434.00	1.9	24.21	46	43	334	136,577	**18,882**	17,908
435.00	1.9	26.30	50	47	1	136,578	**18,838**	17,867
436.00	1.9	30.38	57	54	1	136,579	**18,795**	17,826
437.00	1904.2	14.69	27,978	26,536	358	136,937	**18,801**	17,832
438.00	1.9	23.04	43	41	300	137,236	**18,800**	17,830
439.00	1.9	25.73	49	46	1	137,237	**18,757**	17,790
440.00	1.9	27.35	52	49	1	137,238	**18,714**	17,750
441.00	1.9	15.25	29	27	1	137,239	**18,672**	17,709
442.00	1924.6	21.59	41,545	39,403	296	137,534	**18,670**	17,707
443.00	1.9	25.27	48	45	376	137,911	**18,679**	17,716
444.00	1.9	26.95	51	48	1	137,911	**18,637**	17,676
445.00	1.9	16.34	31	29	1	137,912	**18,595**	17,636
446.00	1918.6	19.42	37,253	35,333	286	138,198	**18,592**	17,633
447.00	1.9	24.65	47	44	353	138,551	**18,597**	17,639
448.00	1.9	26.43	50	47	1	138,552	**18,556**	17,599
449.00	1.9	20.31	38	36	1	138,552	**18,515**	17,560
450.00	1907.6	15.92	30,366	28,800	288	138,841	**18,512**	17,558
451.00	1.9	23.77	45	43	316	139,156	**18,513**	17,559
452.00	1.9	25.93	49	46	1	139,157	**18,472**	17,520
453.00	1.9	27.46	52	49	1	139,158	**18,432**	17,481
454.00	1.9	15.09	28	27	1	139,159	**18,391**	17,443
455.00	1927.6	22.61	43,589	41,342	303	139,462	**18,391**	17,443
456.00	1.9	25.71	49	46	388	139,850	**18,401**	17,453
457.00	1.9	27.25	51	49	1	139,851	**18,361**	17,415
458.00	1.9	15.84	30	28	1	139,852	**18,321**	17,377

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 30 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
459.00	1921.5	20.46	39,315	37,288	291	140,143	**18,319**	17,375
460.00	1.9	25.07	47	45	365	140,508	**18,327**	17,382
461.00	1.9	26.83	51	48	1	140,508	**18,287**	17,345
462.00	1.9	16.40	31	29	1	140,509	**18,248**	17,307
463.00	1917.4	19.09	36,607	34,720	284	140,793	**18,245**	17,305
464.00	1.9	24.73	47	44	350	141,143	**18,251**	17,310
465.00	1.9	26.54	50	47	1	141,144	**18,212**	17,273
466.00	1.9	18.14	34	32	1	141,145	**18,173**	17,236
467.00	1910.5	17.05	32,566	30,887	280	141,425	**18,170**	17,234
468.00	1.9	24.15	46	43	328	141,754	**18,174**	17,237
469.00	1.9	26.33	50	47	1	141,754	**18,135**	17,200
470.00	1.9	24.12	45	43	1	141,755	**18,096**	17,164
471.00	1904.5	14.84	28,256	26,799	309	142,065	**18,097**	17,165
472.00	1.9	23.31	44	42	303	142,368	**18,098**	17,165
473.00	1.9	25.96	49	46	1	142,368	**18,059**	17,128
474.00	1.9	27.42	52	49	1	142,369	**18,021**	17,092
475.00	1.9	15.36	29	27	1	142,370	**17,984**	17,057
476.00	1925.5	22.03	42,416	40,230	300	142,670	**17,984**	17,057
477.00	1.9	25.53	48	46	382	143,052	**17,994**	17,066
478.00	1.9	27.11	51	49	1	143,053	**17,956**	17,031
479.00	1.9	15.79	30	28	1	143,053	**17,919**	16,995
480.00	1920.6	20.30	38,995	36,985	289	143,343	**17,918**	16,994
481.00	1.9	25.03	47	45	363	143,706	**17,926**	17,002
482.00	1.9	26.71	50	48	1	143,707	**17,889**	16,967
483.00	1.9	17.27	33	31	1	143,707	**17,852**	16,932
484.00	1913.2	17.98	34,406	32,632	281	143,989	**17,850**	16,930
485.00	1.9	24.26	46	43	337	144,326	**17,855**	16,934
486.00	1.9	26.33	50	47	1	144,327	**17,818**	16,900
487.00	1.9	27.59	52	49	1	144,327	**17,782**	16,865
488.00	1903.9	14.65	27,897	26,459	335	144,663	**17,786**	16,870
489.00	1.9	22.97	43	41	299	144,962	**17,787**	16,870
490.00	1.9	25.78	49	46	1	144,962	**17,750**	16,835
491.00	1.9	27.34	52	49	1	144,963	**17,714**	16,801
492.00	1.9	15.06	28	27	1	144,964	**17,679**	16,767
493.00	1926.0	22.16	42,672	40,472	299	145,263	**17,679**	16,768
494.00	1.9	25.55	48	46	383	145,646	**17,690**	16,778
495.00	1.9	27.15	51	49	1	145,647	**17,654**	16,744
496.00	1.9	15.89	30	28	1	145,648	**17,619**	16,710
497.00	1919.6	20.05	38,496	36,512	288	145,935	**17,618**	16,710
498.00	1.9	24.82	47	44	359	146,295	**17,626**	16,717
499.00	1.9	26.65	50	48	1	146,295	**17,591**	16,684
500.00	1.9	18.15	34	32	1	146,296	**17,556**	16,651
501.00	1909.7	16.78	32,054	30,401	278	146,574	**17,554**	16,649
502.00	1.9	23.89	45	43	324	146,898	**17,558**	16,653
503.00	1.9	26.03	49	47	1	146,899	**17,523**	16,619
504.00	1.9	27.37	52	49	1	146,900	**17,488**	16,587
505.00	1.9	14.83	28	27	1	146,901	**17,454**	16,554
506.00	1926.2	22.35	43,056	40,836	299	147,199	**17,454**	16,555
507.00	1.9	25.59	48	46	385	147,584	**17,466**	16,565
508.00	1.9	26.96	51	48	1	147,585	**17,431**	16,533
509.00	1.9	15.76	30	28	1	147,586	**17,397**	16,500

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 31 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
510.00	1921.3	20.59	39,555	37,516	291	147,877	**17,397**	16,501
511.00	1.9	24.99	47	45	365	148,242	**17,406**	16,509
512.00	1.9	26.67	50	48	1	148,243	**17,372**	16,477
513.00	1.9	18.01	34	32	1	148,244	**17,338**	16,445
514.00	1912.4	17.74	33,929	32,180	285	148,529	**17,338**	16,444
515.00	1.9	24.29	46	43	335	148,864	**17,343**	16,449
516.00	1.9	26.20	49	47	1	148,865	**17,310**	16,418
517.00	1.9	27.51	52	49	1	148,866	**17,277**	16,386
518.00	1.9	14.71	28	26	1	148,867	**17,243**	16,354
519.00	1669.2	22.74	37,964	36,007	261	149,127	**17,240**	16,351
520.00	1.9	25.66	48	46	337	149,464	**17,246**	16,357
521.00	1.9	27.19	51	49	1	149,465	**17,213**	16,326
522.00	1.9	15.70	30	28	1	149,466	**17,180**	16,294
523.00	1920.1	20.26	38,899	36,894	288	149,754	**17,180**	16,295
524.00	1.9	24.97	47	45	362	150,116	**17,189**	16,303
525.00	1.9	26.58	50	48	1	150,117	**17,156**	16,272
526.00	1.9	18.67	35	33	1	150,118	**17,124**	16,241
527.00	1910.4	17.10	32,672	30,988	285	150,403	**17,124**	16,241
528.00	1.9	24.01	45	43	328	150,730	**17,128**	16,245
529.00	1.9	25.96	49	46	1	150,731	**17,096**	16,215
530.00	1.9	27.34	52	49	1	150,732	**17,064**	16,184
531.00	1.9	15.30	29	27	1	150,732	**17,032**	16,154
532.00	1923.9	21.62	41,586	39,443	296	151,029	**17,033**	16,155
533.00	1.9	25.36	48	45	377	151,406	**17,044**	16,165
534.00	1.9	26.70	50	48	1	151,406	**17,012**	16,135
535.00	1.9	17.04	32	30	1	151,407	**16,980**	16,105
536.00	1914.6	18.46	35,335	33,514	283	151,690	**16,980**	16,105
537.00	1.9	24.27	46	43	341	152,032	**16,987**	16,111
538.00	1.9	26.05	49	47	1	152,032	**16,955**	16,081
539.00	1.9	27.35	52	49	1	152,033	**16,924**	16,052
540.00	1904.0	14.89	28,343	26,882	335	152,369	**16,930**	16,057
541.00	1926.1	22.24	42,840	40,632	593	152,961	**16,964**	16,090
542.00	1.9	25.35	48	45	382	153,344	**16,975**	16,100
543.00	1.9	26.83	51	48	1	153,344	**16,944**	16,071
544.00	1.9	16.96	32	30	1	153,345	**16,913**	16,041
545.00	1914.9	18.54	35,506	33,676	284	153,629	**16,913**	16,041
546.00	1.9	24.35	46	44	343	153,971	**16,920**	16,048
547.00	1.9	26.06	49	47	1	153,972	**16,889**	16,018
548.00	1.9	27.34	52	49	1	153,973	**16,858**	15,989
549.00	1.9	15.08	28	27	1	153,973	**16,828**	15,960
550.00	962.8	22.09	21,267	20,171	149	154,123	**16,813**	15,947
551.00	1.9	25.30	48	45	190	154,313	**16,804**	15,937
552.00	1.9	26.65	50	48	1	154,314	**16,773**	15,909
553.00	1.9	17.44	33	31	1	154,315	**16,743**	15,880
554.00	1913.8	18.12	34,672	32,884	284	154,599	**16,744**	15,880
555.00	1.9	24.24	46	43	338	154,937	**16,750**	15,886
556.00	1.9	25.98	49	46	1	154,937	**16,720**	15,858
557.00	1.9	27.20	51	49	1	154,938	**16,690**	15,830
558.00	1.9	15.06	28	27	1	154,939	**16,660**	15,801
559.00	1924.3	21.70	41,758	39,605	295	155,234	**16,662**	15,803
560.00	1.9	25.08	47	45	375	155,609	**16,672**	15,813

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 32 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
561.00	1.9	26.51	50	47	1	155,610	**16,643**	15,785
562.00	1.9	21.01	40	38	1	155,611	**16,613**	15,757
563.00	1910.6	17.09	32,651	30,968	304	155,915	**16,616**	15,760
564.00	1.9	23.97	45	43	327	156,242	**16,621**	15,765
565.00	1.9	25.90	49	46	1	156,243	**16,592**	15,737
566.00	1.9	27.30	52	49	1	156,243	**16,563**	15,709
567.00	1.9	15.17	29	27	1	156,244	**16,534**	15,681
568.00	1923.4	21.49	41,327	39,197	294	156,538	**16,536**	15,683
569.00	1.9	25.02	47	45	373	156,911	**16,546**	15,693
570.00	1.9	26.44	50	47	1	156,912	**16,517**	15,666
571.00	1.9	23.30	44	42	1	156,913	**16,488**	15,638
572.00	1908.6	16.55	31,586	29,957	317	157,230	**16,493**	15,642
573.00	1.9	23.82	45	43	321	157,551	**16,498**	15,647
574.00	1.9	25.76	49	46	1	157,552	**16,469**	15,620
575.00	1.9	26.98	51	48	1	157,553	**16,440**	15,593
576.00	1.9	15.49	29	28	1	157,554	**16,412**	15,566
577.00	1922.7	21.24	40,837	38,732	295	157,848	**16,414**	15,568
578.00	1.9	24.98	47	45	371	158,219	**16,424**	15,577
579.00	1.9	26.45	50	47	1	158,220	**16,396**	15,551
580.00	1.9	27.61	52	49	1	158,220	**16,368**	15,524
581.00	1905.0	15.17	28,907	27,417	340	158,560	**16,375**	15,530
582.00	1.9	23.13	44	41	304	158,865	**16,378**	15,534
583.00	1.9	25.49	48	46	1	158,865	**16,350**	15,507
584.00	1.9	26.76	50	48	1	158,866	**16,322**	15,481
585.00	1.9	16.46	31	29	1	158,867	**16,294**	15,454
586.00	1917.6	19.55	37,482	35,550	288	159,155	**16,296**	15,456
587.00	1.9	24.50	46	44	352	159,507	**16,304**	15,464
588.00	1.9	26.05	49	47	1	159,508	**16,276**	15,437
589.00	1.9	27.16	51	49	1	159,509	**16,249**	15,411
590.00	1903.8	14.88	28,320	26,860	334	159,842	**16,255**	15,417
591.00	1924.8	21.82	42,005	39,840	585	160,428	**16,287**	15,448
592.00	1.9	25.02	47	45	376	160,804	**16,298**	15,458
593.00	1.9	26.27	50	47	1	160,805	**16,270**	15,432
594.00	1.9	24.64	46	44	1	160,806	**16,243**	15,406
595.00	1907.0	15.95	30,414	28,846	323	161,128	**16,248**	15,411
596.00	1.9	23.51	44	42	314	161,442	**16,253**	15,415
597.00	1.9	25.42	48	45	1	161,443	**16,225**	15,389
598.00	1.9	26.71	50	48	1	161,444	**16,198**	15,363
599.00	1.9	16.22	31	29	1	161,445	**16,171**	15,338
600.00	1918.0	19.58	37,559	35,622	286	161,731	**16,173**	15,339
601.00	1.9	24.43	46	44	352	162,083	**16,181**	15,347
602.00	1.9	25.90	49	46	1	162,084	**16,155**	15,322
603.00	1.9	27.06	51	48	1	162,085	**16,128**	15,296
604.00	1.9	15.12	29	27	1	162,085	**16,101**	15,271
605.00	1923.9	21.54	41,440	39,303	294	162,379	**16,104**	15,274
606.00	1.9	24.89	47	45	373	162,752	**16,114**	15,283
607.00	1.9	26.25	50	47	1	162,753	**16,088**	15,258
608.00	1.9	23.96	45	43	1	162,754	**16,061**	15,233
609.00	1907.8	16.05	30,622	29,043	318	163,072	**16,066**	15,238
610.00	1.9	23.32	44	42	313	163,385	**16,071**	15,242
611.00	1.9	25.25	48	45	1	163,386	**16,044**	15,217

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 33 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
612.00	1.9	26.47	50	47	1	163,387	**16,018**	15,193
613.00	1.9	16.86	32	30	1	163,387	**15,992**	15,168
614.00	1915.2	18.61	35,651	33,813	283	163,671	**15,994**	15,169
615.00	1.9	23.99	45	43	340	164,011	**16,001**	15,176
616.00	1.9	25.71	49	46	1	164,012	**15,975**	15,152
617.00	1.9	26.80	51	48	1	164,013	**15,949**	15,127
618.00	1.9	15.68	30	28	1	164,013	**15,924**	15,103
619.00	1919.4	20.01	38,405	36,426	286	164,299	**15,926**	15,105
620.00	1.9	24.42	46	44	356	164,655	**15,934**	15,113
621.00	1.9	25.83	49	46	1	164,656	**15,909**	15,089
622.00	1.9	26.86	51	48	1	164,656	**15,883**	15,065
623.00	1.9	15.08	28	27	1	164,657	**15,858**	15,040
624.00	1922.8	21.20	40,760	38,659	291	164,948	**15,860**	15,043
625.00	1.9	24.70	47	44	368	165,316	**15,870**	15,052
626.00	1.9	25.99	49	47	1	165,317	**15,845**	15,028
627.00	1.9	27.03	51	48	1	165,318	**15,820**	15,004
628.00	1.9	14.44	27	26	1	165,318	**15,795**	14,981
629.00	1361.9	22.27	30,335	28,771	209	165,527	**15,790**	14,976
630.00	1.9	24.80	47	44	268	165,795	**15,790**	14,976
631.00	1.9	26.09	49	47	1	165,795	**15,765**	14,952
632.00	1.9	27.12	51	49	1	165,796	**15,740**	14,929
633.00	1.9	14.50	27	26	1	165,797	**15,715**	14,905
634.00	1926.3	22.30	42,956	40,742	296	166,093	**15,719**	14,908
635.00	1.9	24.91	47	45	379	166,472	**15,730**	14,919
636.00	1.9	26.20	49	47	1	166,473	**15,705**	14,895
637.00	1.9	27.12	51	49	1	166,473	**15,680**	14,872
638.00	1.9	15.16	29	27	1	166,474	**15,656**	14,849
639.00	1.9	22.98	43	41	1	166,475	**15,631**	14,826
640.00	1.9	25.25	48	45	1	166,475	**15,607**	14,803
641.00	1.9	26.30	50	47	1	166,476	**15,583**	14,780
642.00	1.9	17.70	33	32	1	166,477	**15,559**	14,757
643.00	1914.9	18.43	35,289	33,470	289	166,766	**15,561**	14,759
644.00	1.9	23.98	45	43	339	167,104	**15,569**	14,766
645.00	1.9	25.44	48	46	1	167,105	**15,545**	14,743
646.00	1.9	26.60	50	48	1	167,106	**15,521**	14,721
647.00	1.9	15.86	30	28	1	167,106	**15,497**	14,698
648.00	1918.9	19.76	37,914	35,960	285	167,392	**15,499**	14,700
649.00	1.9	24.30	46	43	353	167,744	**15,508**	14,709
650.00	1.9	25.69	48	46	1	167,745	**15,484**	14,686
651.00	1.9	26.76	50	48	1	167,746	**15,460**	14,663
652.00	1.9	14.82	28	27	1	167,746	**15,437**	14,641
653.00	1923.2	21.22	40,814	38,710	289	168,035	**15,440**	14,644
654.00	1.9	24.66	47	44	368	168,403	**15,450**	14,653
655.00	1.9	25.85	49	46	1	168,404	**15,426**	14,631
656.00	1.9	26.77	51	48	1	168,405	**15,403**	14,609
657.00	1.9	14.58	28	26	1	168,406	**15,380**	14,587
658.00	1924.4	21.62	41,605	39,461	291	168,696	**15,383**	14,590
659.00	1.9	24.59	46	44	371	169,067	**15,393**	14,600
660.00	1.9	25.75	49	46	1	169,068	**15,370**	14,578
661.00	1.9	26.63	50	48	1	169,069	**15,347**	14,556
662.00	1.9	14.90	28	27	1	169,069	**15,324**	14,534

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 34 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
663.00	1922.5	20.83	40,046	37,982	286	169,356	**15,326**	14,536
664.00	1.9	24.32	46	44	362	169,718	**15,336**	14,545
665.00	1.9	25.55	48	46	1	169,719	**15,313**	14,524
666.00	1.9	26.59	50	48	1	169,720	**15,290**	14,502
667.00	1.9	15.47	29	28	1	169,720	**15,267**	14,480
668.00	1921.9	20.68	39,739	37,691	290	170,010	**15,270**	14,483
669.00	1.9	24.37	46	44	361	170,371	**15,280**	14,492
670.00	1.9	25.74	49	46	1	170,372	**15,257**	14,471
671.00	1.9	26.56	50	48	1	170,373	**15,235**	14,449
672.00	1.9	14.93	28	27	1	170,373	**15,212**	14,428
673.00	1923.0	21.07	40,511	38,422	289	170,662	**15,215**	14,431
674.00	1.9	24.34	46	44	364	171,026	**15,225**	14,440
675.00	1.9	25.57	48	46	1	171,027	**15,202**	14,419
676.00	1.9	26.48	50	47	1	171,028	**15,180**	14,397
677.00	1.9	14.87	28	27	1	171,028	**15,158**	14,376
678.00	1922.8	20.96	40,301	38,223	287	171,316	**15,161**	14,379
679.00	1.9	24.27	46	43	363	171,678	**15,170**	14,388
680.00	1.9	25.49	48	46	1	171,679	**15,148**	14,367
681.00	1.9	26.46	50	47	1	171,680	**15,126**	14,346
682.00	1.9	15.46	29	28	1	171,681	**15,104**	14,325
683.00	1920.5	20.21	38,817	36,816	286	171,966	**15,107**	14,328
684.00	1.9	24.11	45	43	355	172,321	**15,116**	14,337
685.00	1.9	25.43	48	46	1	172,322	**15,094**	14,316
686.00	1.9	26.17	49	47	1	172,323	**15,072**	14,295
687.00	1.9	16.98	32	30	1	172,324	**15,050**	14,274
688.00	1916.0	18.78	35,983	34,128	286	172,609	**15,053**	14,277
689.00	1.9	23.62	45	42	339	172,948	**15,061**	14,284
690.00	1.9	25.17	47	45	1	172,949	**15,039**	14,264
691.00	1.9	26.05	49	47	1	172,950	**15,017**	14,243
692.00	1.9	20.29	38	36	1	172,951	**14,996**	14,223
693.00	1911.2	17.08	32,649	30,966	298	173,249	**15,000**	14,227
694.00	1.9	23.35	44	42	322	173,571	**15,006**	14,233
695.00	1.9	24.82	47	44	1	173,572	**14,985**	14,212
696.00	1.9	25.91	49	46	1	173,572	**14,963**	14,192
697.00	1.9	26.54	50	47	1	173,573	**14,942**	14,172
698.00	1.9	14.42	27	26	1	173,574	**14,920**	14,151
699.00	1.9	22.04	42	39	1	173,574	**14,899**	14,131
700.00	1.9	24.51	46	44	1	173,575	**14,878**	14,111
701.00	1.9	25.60	48	46	1	173,576	**14,857**	14,091
702.00	1.9	26.34	50	47	1	173,577	**14,836**	14,071
703.00	1.9	15.47	29	28	1	173,577	**14,815**	14,051
704.00	1919.8	19.99	38,387	36,408	284	173,861	**14,818**	14,054
705.00	1.9	24.04	45	43	353	174,214	**14,827**	14,062
706.00	1.9	25.11	47	45	1	174,215	**14,806**	14,043
707.00	1.9	26.11	49	47	1	174,216	**14,785**	14,023
708.00	1.9	26.88	51	48	1	174,216	**14,764**	14,003
709.00	1.9	15.35	29	27	1	174,217	**14,743**	13,983
710.00	1.9	22.63	43	41	1	174,218	**14,723**	13,964
711.00	1.9	24.69	47	44	1	174,218	**14,702**	13,944
712.00	1.9	25.63	48	46	1	174,219	**14,681**	13,925
713.00	1.9	26.44	50	47	1	174,220	**14,661**	13,905

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 35 of 136)

ect Duct Traverse Type

				Test Category (1, 2, 3, 4)	1			
	rse Factor	Pitot F.	Duct area	Air Density @				Rated Capacity
	478	0.99	0.1437	STP				Cat 3
Total Output				1.204	kg/m³			Cat 2
Total Input	X							Cat 1
EFFIC.								

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
714.00	1.9	15.16	29	27	1	174,221	**14,640**	13,886
715.00	1921.2	20.49	39,365	37,336	286	174,506	**14,644**	13,889
716.00	1.9	23.91	45	43	356	174,862	**14,653**	13,898
717.00	1.9	25.07	47	45	1	174,863	**14,633**	13,879
718.00	1.9	26.07	49	47	1	174,864	**14,613**	13,859
719.00	1.9	26.94	51	48	1	174,864	**14,592**	13,840
720.00	1907.8	15.91	30,359	28,794	341	175,205	**14,600**	13,848
721.00	1.9	22.71	43	41	307	175,513	**14,606**	13,853
722.00	1.9	24.56	46	44	1	175,514	**14,586**	13,834
723.00	1.9	25.44	48	46	1	175,514	**14,566**	13,815
724.00	1.9	26.27	50	47	1	175,515	**14,545**	13,796
725.00	1.9	15.48	29	28	1	175,516	**14,525**	13,777
726.00	1918.7	19.62	37,642	35,702	281	175,797	**14,529**	13,780
727.00	1.9	23.71	45	42	347	176,143	**14,537**	13,788
728.00	1.9	24.81	47	44	1	176,144	**14,517**	13,769
729.00	1.9	25.75	49	46	1	176,145	**14,498**	13,750
730.00	1.9	26.51	50	47	1	176,146	**14,478**	13,731
731.00	1.9	14.52	27	26	1	176,146	**14,458**	13,713
732.00	1666.0	21.38	35,624	33,787	249	176,396	**14,459**	13,713
733.00	1.9	24.08	45	43	316	176,712	**14,465**	13,719
734.00	1.9	25.03	47	45	1	176,713	**14,445**	13,701
735.00	1.9	25.74	49	46	1	176,713	**14,426**	13,682
736.00	1.9	26.53	50	47	1	176,714	**14,406**	13,663
737.00	1.9	15.58	29	28	1	176,715	**14,387**	13,645
738.00	1.9	22.72	43	41	1	176,716	**14,367**	13,627
739.00	1.9	24.46	46	44	1	176,716	**14,348**	13,608
740.00	1.9	25.36	48	45	1	176,717	**14,328**	13,590
741.00	1.9	26.24	50	47	1	176,718	**14,309**	13,572
742.00	1.9	16.12	30	29	1	176,719	**14,290**	13,553
743.00	1918.1	19.47	37,354	35,429	285	177,003	**14,294**	13,557
744.00	1.9	23.61	45	42	345	177,348	**14,302**	13,565
745.00	1.9	24.83	47	44	1	177,349	**14,283**	13,547
746.00	1.9	25.58	48	46	1	177,350	**14,264**	13,529
747.00	1.9	26.35	50	47	1	177,350	**14,245**	13,511
748.00	1.9	14.78	28	26	1	177,351	**14,226**	13,493
749.00	1923.6	21.26	40,902	38,794	289	177,640	**14,230**	13,497
750.00	1.9	24.04	45	43	363	178,004	**14,240**	13,506
751.00	1.9	25.06	47	45	1	178,004	**14,221**	13,488
752.00	1.9	25.82	49	46	1	178,005	**14,203**	13,470
753.00	1.9	26.63	50	48	1	178,006	**14,184**	13,453
754.00	1651.4	15.74	25,988	24,648	292	178,298	**14,188**	13,457
755.00	1.9	22.77	43	41	265	178,563	**14,190**	13,459
756.00	1.9	24.46	46	44	1	178,564	**14,172**	13,441
757.00	1.9	25.25	48	45	1	178,565	**14,153**	13,424
758.00	1.9	25.94	49	46	1	178,566	**14,134**	13,406
759.00	1.9	19.40	37	35	1	178,566	**14,116**	13,388
760.00	1913.4	17.89	34,230	32,466	298	178,864	**14,121**	13,393
761.00	1.9	23.12	44	41	327	179,191	**14,128**	13,400
762.00	1.9	24.54	46	44	1	179,192	**14,110**	13,382
763.00	1.9	25.44	48	46	1	179,193	**14,091**	13,365
764.00	1.9	26.15	49	47	1	179,193	**14,073**	13,347

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 36 of 136)

ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
765.00	1.9	16.31	31	29	1	179,194	**14,054**	13,330
766.00	1917.5	19.23	36,880	34,979	284	179,478	**14,058**	13,334
767.00	1.9	23.57	44	42	342	179,821	**14,067**	13,342
768.00	1.9	24.60	46	44	1	179,821	**14,049**	13,324
769.00	1.9	25.45	48	46	1	179,822	**14,030**	13,307
770.00	1.9	26.22	49	47	1	179,823	**14,012**	13,290
771.00	1.9	15.55	29	28	1	179,824	**13,994**	13,273
772.00	1919.9	19.99	38,373	36,395	285	180,108	**13,998**	13,276
773.00	1.9	23.61	45	42	349	180,457	**14,007**	13,285
774.00	1.9	24.69	47	44	1	180,458	**13,989**	13,268
775.00	1.9	25.58	48	46	1	180,459	**13,971**	13,251
776.00	1.9	26.22	49	47	1	180,460	**13,953**	13,234
777.00	1.9	14.39	27	26	1	180,460	**13,935**	13,217
778.00	1924.1	21.44	41,256	39,130	288	180,748	**13,939**	13,221
779.00	1.9	24.00	45	43	365	181,113	**13,950**	13,231
780.00	1.9	24.93	47	45	1	181,113	**13,932**	13,214
781.00	1.9	25.67	48	46	1	181,114	**13,914**	13,197
782.00	1.9	26.42	50	47	1	181,115	**13,896**	13,180
783.00	1.9	14.18	27	25	1	181,116	**13,879**	13,163
784.00	1.9	21.93	41	39	1	181,116	**13,861**	13,146
785.00	1.9	24.09	45	43	1	181,117	**13,843**	13,130
786.00	1.9	25.19	48	45	1	181,118	**13,826**	13,113
787.00	1.9	25.80	49	46	1	181,118	**13,808**	13,096
788.00	1.9	26.44	50	47	1	181,119	**13,791**	13,080
789.00	1.9	14.81	28	26	1	181,120	**13,773**	13,063
790.00	1.9	22.32	42	40	1	181,120	**13,756**	13,047
791.00	1.9	24.12	45	43	1	181,121	**13,739**	13,030
792.00	1.9	25.06	47	45	1	181,122	**13,721**	13,014
793.00	1.9	25.77	49	46	1	181,123	**13,704**	12,998
794.00	1.9	26.49	50	47	1	181,124	**13,687**	12,981
795.00	1.9	14.79	28	26	1	181,124	**13,670**	12,965
796.00	1.9	22.28	42	40	1	181,125	**13,653**	12,949
797.00	1.9	24.20	46	43	1	181,126	**13,636**	12,933
798.00	1.9	25.04	47	45	1	181,126	**13,619**	12,917
799.00	1.9	25.72	49	46	1	181,127	**13,602**	12,900
800.00	1.9	26.32	50	47	1	181,128	**13,585**	12,884
801.00	1903.3	14.31	27,236	25,832	323	181,450	**13,592**	12,891
802.00	1.9	21.93	41	39	288	181,738	**13,596**	12,896
803.00	1.9	24.02	45	43	1	181,739	**13,579**	12,879
804.00	1.9	24.83	47	44	1	181,740	**13,563**	12,864
805.00	1.9	25.71	48	46	1	181,740	**13,546**	12,848
806.00	1.9	26.13	49	47	1	181,741	**13,529**	12,832
807.00	1.9	14.64	28	26	1	181,742	**13,512**	12,816
808.00	1922.3	20.80	39,976	37,915	284	182,026	**13,517**	12,820
809.00	1.9	23.71	45	42	357	182,383	**13,527**	12,829
810.00	1.9	24.63	46	44	1	182,384	**13,510**	12,813
811.00	1.9	25.36	48	45	1	182,384	**13,493**	12,798
812.00	1.9	26.08	49	47	1	182,385	**13,477**	12,782
813.00	1.9	15.71	30	28	1	182,386	**13,460**	12,766
814.00	1918.1	19.43	37,265	35,344	281	182,667	**13,464**	12,770
815.00	1.9	23.31	44	42	342	183,009	**13,473**	12,779

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ect Duct Traverse Type

			Test Category (1, 2, 3, 4)	1		
	rse Factor	Pitot F.	Duct area	Air Density @		Rated Capacity
	478	0.99	0.1437	STP		Cat 3
Total Output				1.204	kg/m³	Cat 2
Total Input	X					Cat 1
EFFIC.						

Time	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate kJ/hr	Heat Rel. Rate Btu/hr	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr
816.00	1.9	24.41	46	44	1	183,010	**13,457**	12,763
817.00	1.9	25.10	47	45	1	183,010	**13,440**	12,747
818.00	1.9	25.80	49	46	1	183,011	**13,424**	12,732
819.00	1.9	26.34	50	47	1	183,012	**13,407**	12,716
820.00	1909.3	16.47	31,447	29,826	341	183,353	**13,416**	12,724
821.00	1.9	22.35	42	40	309	183,662	**13,422**	12,730
822.00	1.9	23.93	45	43	1	183,663	**13,406**	12,715
823.00	1.9	24.72	47	44	1	183,663	**13,390**	12,700
824.00	1.9	25.44	48	46	1	183,664	**13,374**	12,684
825.00	1.9	25.87	49	46	1	183,665	**13,357**	12,669
826.00	1.9	15.43	29	28	1	183,666	**13,341**	12,654
827.00	1917.9	19.41	37,220	35,301	279	183,944	**13,345**	12,657
828.00	1.9	23.20	44	42	341	184,285	**13,354**	12,666
829.00	1.9	24.18	46	43	1	184,286	**13,338**	12,650
830.00	1.9	22.94	43	41	1	184,287	**13,322**	12,635

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 38 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
0.00	on	0.9
1.00		873.1
2.00		876.7
3.00		0.9
4.00		0.9
5.00	off	938.3
6.00		936.1
7.00		873.7
8.00		872.1
9.00		870.8
10.00		936.7
11.00		0.9
12.00		0.9
13.00		871.9
14.00		870.5
15.00		941.4
16.00		0.9
17.00		0.9
18.00		871.6
19.00		930.5
20.00		938.3
21.00		0.9
22.00		0.9
23.00		871.2
24.00		930.0
25.00		0.9
26.00		0.9
27.00		0.9
28.00		870.3
29.00		939.2
30.00		0.9
31.00		0.9
32.00		933.0
33.00		931.8
34.00		931.3
35.00		931.1
36.00		931.1
37.00		931.1
38.00		930.9
39.00		930.8
40.00		930.8
41.00		931.1
42.00		931.1
43.00		931.5
44.00		931.5
45.00		931.4
46.00		931.4
47.00		931.5
48.00		931.6
49.00		931.2
50.00		931.3

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Appendix B Data and Calculation forms (page 39 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
51.00		931.3
52.00		931.1
53.00		931.0
54.00		930.6
55.00		930.5
56.00		930.4
57.00		930.3
58.00		930.0
59.00		929.8
60.00		929.7
61.00		929.6
62.00		929.4
63.00		929.4
64.00		929.2
65.00		929.3
66.00		929.2
67.00		929.2
68.00		929.1
69.00		929.2
70.00		929.4
71.00		929.4
72.00		929.3
73.00		929.5
74.00		929.7
75.00		929.7
76.00		929.8
77.00		930.0
78.00		930.0
79.00		930.1
80.00		930.2
81.00		930.4
82.00		930.6
83.00		930.8
84.00		930.7
85.00		931.0
86.00		930.9
87.00		931.0
88.00		931.1
89.00		930.9
90.00		930.9
91.00		930.9
92.00		930.8
93.00		930.6
94.00		930.5
95.00		930.2
96.00		930.3
97.00		929.9
98.00		929.8
99.00		929.9
100.00		929.7
101.00		929.6

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Appendix B Data and Calculation forms (page 40 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
102.00		929.2
103.00		929.2
104.00		929.0
105.00		929.0
106.00		929.0
107.00		929.0
108.00		928.9
109.00		928.8
110.00		928.8
111.00		928.8
112.00		928.7
113.00		928.6
114.00		928.8
115.00		928.7
116.00		928.8
117.00		928.6
118.00		928.9
119.00		928.7
120.00		928.8
121.00		928.9
122.00		929.1
123.00		928.9
124.00		929.0
125.00		929.0
126.00		929.0
127.00		929.0
128.00		929.1
129.00		929.3
130.00		929.3
131.00		929.5
132.00		929.7
133.00		929.9
134.00		929.8
135.00		930.2
136.00		930.3
137.00		930.5
138.00		930.6
139.00		930.7
140.00		930.9
141.00		930.9
142.00		930.9
143.00		930.6
144.00		930.7
145.00		930.5
146.00		930.4
147.00		930.3
148.00		930.2
149.00		930.1
150.00		930.1
151.00		930.0
152.00		929.9

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Appendix B Data and Calculation forms (page 41 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
153.00		929.9
154.00		929.7
155.00		929.6
156.00		929.8
157.00		929.6
158.00		929.4
159.00		929.5
160.00		929.3
161.00		929.4
162.00		929.4
163.00		929.6
164.00		929.4
165.00		929.3
166.00		929.3
167.00		929.3
168.00		929.2
169.00		929.2
170.00		929.1
171.00		929.1
172.00		928.9
173.00		929.0
174.00		929.0
175.00		928.9
176.00		928.9
177.00		928.9
178.00		929.0
179.00		928.9
180.00		929.1
181.00		929.3
182.00		929.2
183.00		929.2
184.00		929.3
185.00		929.4
186.00		929.2
187.00		929.5
188.00		929.4
189.00		929.5
190.00		929.5
191.00		929.4
192.00		929.5
193.00		929.3
194.00		929.3
195.00		929.3
196.00		929.4
197.00		929.3
198.00		929.1
199.00		929.2
200.00		929.4
201.00		929.2
202.00		929.1
203.00		934.0

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	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
204.00		0.9
205.00		0.9
206.00		932.5
207.00		931.6
208.00		930.9
209.00		930.5
210.00		929.9
211.00		929.7
212.00		937.3
213.00		0.9
214.00		0.9
215.00		932.2
216.00		931.1
217.00		930.4
218.00		929.7
219.00		941.1
220.00		0.9
221.00		0.9
222.00		931.2
223.00		929.9
224.00		940.1
225.00		0.9
226.00		0.9
227.00		930.4
228.00		936.9
229.00		0.9
230.00		0.9
231.00		931.0
232.00		936.9
233.00		0.9
234.00		0.9
235.00		931.3
236.00		937.9
237.00		0.9
238.00		0.9
239.00		931.3
240.00		938.7
241.00		0.9
242.00		0.9
243.00		931.1
244.00		939.6
245.00		0.9
246.00		0.9
247.00		931.2
248.00		939.8
249.00		0.9
250.00		0.9
251.00		931.2
252.00		940.5
253.00		0.9
254.00		0.9

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Appendix B Data and Calculation forms (page 43 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
255.00		931.2
256.00		941.3
257.00		0.9
258.00		0.9
259.00		930.9
260.00		0.9
261.00		0.9
262.00		0.9
263.00		931.5
264.00		0.9
265.00		0.9
266.00		0.9
267.00		932.3
268.00		0.9
269.00		0.9
270.00		0.9
271.00		932.5
272.00		0.9
273.00		0.9
274.00		0.9
275.00		933.5
276.00		0.9
277.00		0.9
278.00		0.9
279.00		933.1
280.00		0.9
281.00		0.9
282.00		0.9
283.00		935.1
284.00		0.9
285.00		0.9
286.00		0.9
287.00		935.2
288.00		0.9
289.00		0.9
290.00		0.9
291.00		936.1
292.00		0.9
293.00		0.9
294.00		0.9
295.00		936.9
296.00		0.9
297.00		0.9
298.00		0.9
299.00		936.9
300.00		0.9
301.00		0.9
302.00		0.9
303.00		1147.7
304.00		0.9
305.00		0.9

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	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
306.00		0.9
307.00		936.5
308.00		0.9
309.00		0.9
310.00		0.9
311.00		937.1
312.00		0.9
313.00		0.9
314.00		0.9
315.00		936.4
316.00		0.9
317.00		0.9
318.00		0.9
319.00		934.8
320.00		0.9
321.00		0.9
322.00		0.9
323.00		932.6
324.00		0.9
325.00		0.9
326.00		0.9
327.00		931.1
328.00		0.9
329.00		0.9
330.00		0.9
331.00		1041.1
332.00		941.7
333.00		0.9
334.00		0.9
335.00		0.9
336.00		939.9
337.00		0.9
338.00		0.9
339.00		0.9
340.00		0.9
341.00		0.9
342.00		0.9
343.00		0.9
344.00		935.6
345.00		0.9
346.00		0.9
347.00		0.9
348.00		932.4
349.00		0.9
350.00		0.9
351.00		0.9
352.00		931.1
353.00		942.1
354.00		0.9
355.00		0.9
356.00		0.9

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	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
357.00		940.0
358.00		0.9
359.00		0.9
360.00		0.9
361.00		938.6
362.00		0.9
363.00		0.9
364.00		0.9
365.00		933.7
366.00		0.9
367.00		0.9
368.00		0.9
369.00		931.3
370.00		0.9
371.00		0.9
372.00		0.9
373.00		0.9
374.00		940.7
375.00		0.9
376.00		0.9
377.00		0.9
378.00		937.6
379.00		0.9
380.00		0.9
381.00		0.9
382.00		936.2
383.00		0.9
384.00		0.9
385.00		0.9
386.00		933.1
387.00		0.9
388.00		0.9
389.00		0.9
390.00		931.0
391.00		941.9
392.00		0.9
393.00		0.9
394.00		0.9
395.00		938.9
396.00		0.9
397.00		0.9
398.00		0.9
399.00		935.3
400.00		0.9
401.00		0.9
402.00		0.9
403.00		932.7
404.00		0.9
405.00		0.9
406.00		0.9
407.00		0.9

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Appendix B Data and Calculation forms (page 46 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
408.00		941.3
409.00		0.9
410.00		0.9
411.00		0.9
412.00		937.6
413.00		0.9
414.00		0.9
415.00		0.9
416.00		934.0
417.00		0.9
418.00		0.9
419.00		0.9
420.00		930.8
421.00		0.9
422.00		0.9
423.00		0.9
424.00		0.9
425.00		940.6
426.00		0.9
427.00		0.9
428.00		0.9
429.00		938.3
430.00		0.9
431.00		0.9
432.00		0.9
433.00		935.3
434.00		0.9
435.00		0.9
436.00		0.9
437.00		930.9
438.00		0.9
439.00		0.9
440.00		0.9
441.00		0.9
442.00		940.9
443.00		0.9
444.00		0.9
445.00		0.9
446.00		937.9
447.00		0.9
448.00		0.9
449.00		0.9
450.00		932.5
451.00		0.9
452.00		0.9
453.00		0.9
454.00		0.9
455.00		942.3
456.00		0.9
457.00		0.9
458.00		0.9

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Appendix B Data and Calculation forms (page 47 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
459.00		939.3
460.00		0.9
461.00		0.9
462.00		0.9
463.00		937.3
464.00		0.9
465.00		0.9
466.00		0.9
467.00		934.0
468.00		0.9
469.00		0.9
470.00		0.9
471.00		931.0
472.00		0.9
473.00		0.9
474.00		0.9
475.00		0.9
476.00		941.3
477.00		0.9
478.00		0.9
479.00		0.9
480.00		938.9
481.00		0.9
482.00		0.9
483.00		0.9
484.00		935.3
485.00		0.9
486.00		0.9
487.00		0.9
488.00		930.7
489.00		0.9
490.00		0.9
491.00		0.9
492.00		0.9
493.00		941.5
494.00		0.9
495.00		0.9
496.00		0.9
497.00		938.4
498.00		0.9
499.00		0.9
500.00		0.9
501.00		933.5
502.00		0.9
503.00		0.9
504.00		0.9
505.00		0.9
506.00		941.6
507.00		0.9
508.00		0.9
509.00		0.9

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	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
510.00		939.2
511.00		0.9
512.00		0.9
513.00		0.9
514.00		934.9
515.00		0.9
516.00		0.9
517.00		0.9
518.00		0.9
519.00		816.0
520.00		0.9
521.00		0.9
522.00		0.9
523.00		938.6
524.00		0.9
525.00		0.9
526.00		0.9
527.00		933.9
528.00		0.9
529.00		0.9
530.00		0.9
531.00		0.9
532.00		940.5
533.00		0.9
534.00		0.9
535.00		0.9
536.00		936.0
537.00		0.9
538.00		0.9
539.00		0.9
540.00		930.8
541.00		941.6
542.00		0.9
543.00		0.9
544.00		0.9
545.00		936.1
546.00		0.9
547.00		0.9
548.00		0.9
549.00		0.9
550.00		470.6
551.00		0.9
552.00		0.9
553.00		0.9
554.00		935.6
555.00		0.9
556.00		0.9
557.00		0.9
558.00		0.9
559.00		940.7
560.00		0.9

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 49 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
561.00		0.9
562.00		0.9
563.00		934.0
564.00		0.9
565.00		0.9
566.00		0.9
567.00		0.9
568.00		940.2
569.00		0.9
570.00		0.9
571.00		0.9
572.00		933.0
573.00		0.9
574.00		0.9
575.00		0.9
576.00		0.9
577.00		939.9
578.00		0.9
579.00		0.9
580.00		0.9
581.00		931.2
582.00		0.9
583.00		0.9
584.00		0.9
585.00		0.9
586.00		937.4
587.00		0.9
588.00		0.9
589.00		0.9
590.00		930.7
591.00		940.9
592.00		0.9
593.00		0.9
594.00		0.9
595.00		932.3
596.00		0.9
597.00		0.9
598.00		0.9
599.00		0.9
600.00		937.6
601.00		0.9
602.00		0.9
603.00		0.9
604.00		0.9
605.00		940.5
606.00		0.9
607.00		0.9
608.00		0.9
609.00		932.6
610.00		0.9
611.00		0.9

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 50 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
612.00		0.9
613.00		0.9
614.00		936.3
615.00		0.9
616.00		0.9
617.00		0.9
618.00		0.9
619.00		938.3
620.00		0.9
621.00		0.9
622.00		0.9
623.00		0.9
624.00		940.0
625.00		0.9
626.00		0.9
627.00		0.9
628.00		0.9
629.00		665.8
630.00		0.9
631.00		0.9
632.00		0.9
633.00		0.9
634.00		941.7
635.00		0.9
636.00		0.9
637.00		0.9
638.00		0.9
639.00		0.9
640.00		0.9
641.00		0.9
642.00		0.9
643.00		936.1
644.00		0.9
645.00		0.9
646.00		0.9
647.00		0.9
648.00		938.1
649.00		0.9
650.00		0.9
651.00		0.9
652.00		0.9
653.00		940.2
654.00		0.9
655.00		0.9
656.00		0.9
657.00		0.9
658.00		940.8
659.00		0.9
660.00		0.9
661.00		0.9
662.00		0.9

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 51 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
663.00		939.8
664.00		0.9
665.00		0.9
666.00		0.9
667.00		0.9
668.00		939.5
669.00		0.9
670.00		0.9
671.00		0.9
672.00		0.9
673.00		940.0
674.00		0.9
675.00		0.9
676.00		0.9
677.00		0.9
678.00		939.9
679.00		0.9
680.00		0.9
681.00		0.9
682.00		0.9
683.00		938.8
684.00		0.9
685.00		0.9
686.00		0.9
687.00		0.9
688.00		936.6
689.00		0.9
690.00		0.9
691.00		0.9
692.00		0.9
693.00		934.3
694.00		0.9
695.00		0.9
696.00		0.9
697.00		0.9
698.00		0.9
699.00		0.9
700.00		0.9
701.00		0.9
702.00		0.9
703.00		0.9
704.00		938.5
705.00		0.9
706.00		0.9
707.00		0.9
708.00		0.9
709.00		0.9
710.00		0.9
711.00		0.9
712.00		0.9
713.00		0.9

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 52 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
714.00		0.9
715.00		939.2
716.00		0.9
717.00		0.9
718.00		0.9
719.00		0.9
720.00		932.6
721.00		0.9
722.00		0.9
723.00		0.9
724.00		0.9
725.00		0.9
726.00		937.9
727.00		0.9
728.00		0.9
729.00		0.9
730.00		0.9
731.00		0.9
732.00		814.4
733.00		0.9
734.00		0.9
735.00		0.9
736.00		0.9
737.00		0.9
738.00		0.9
739.00		0.9
740.00		0.9
741.00		0.9
742.00		0.9
743.00		937.7
744.00		0.9
745.00		0.9
746.00		0.9
747.00		0.9
748.00		0.9
749.00		940.4
750.00		0.9
751.00		0.9
752.00		0.9
753.00		0.9
754.00		807.3
755.00		0.9
756.00		0.9
757.00		0.9
758.00		0.9
759.00		0.9
760.00		935.4
761.00		0.9
762.00		0.9
763.00		0.9
764.00		0.9

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 53 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off	SCFM
765.00		0.9
766.00		937.4
767.00		0.9
768.00		0.9
769.00		0.9
770.00		0.9
771.00		0.9
772.00		938.5
773.00		0.9
774.00		0.9
775.00		0.9
776.00		0.9
777.00		0.9
778.00		940.6
779.00		0.9
780.00		0.9
781.00		0.9
782.00		0.9
783.00		0.9
784.00		0.9
785.00		0.9
786.00		0.9
787.00		0.9
788.00		0.9
789.00		0.9
790.00		0.9
791.00		0.9
792.00		0.9
793.00		0.9
794.00		0.9
795.00		0.9
796.00		0.9
797.00		0.9
798.00		0.9
799.00		0.9
800.00		0.9
801.00		930.4
802.00		0.9
803.00		0.9
804.00		0.9
805.00		0.9
806.00		0.9
807.00		0.9
808.00		939.7
809.00		0.9
810.00		0.9
811.00		0.9
812.00		0.9
813.00		0.9
814.00		937.7
815.00		0.9

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 54 of 136)

	Target	13419
	44730	Btu/hr
	29074.5	Btu/hr
Total Output	19681.2	Btu/hr
Total Input	13419	Btu/hr
EFFIC.		

Time	Unit on or off SCFM
816.00	0.9
817.00	0.9
818.00	0.9
819.00	0.9
820.00	933.4
821.00	0.9
822.00	0.9
823.00	0.9
824.00	0.9
825.00	0.9
826.00	0.9
827.00	937.6
828.00	0.9
829.00	0.9
830.00	0.9

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsDirectoutput

Appendix B Data and Calculation forms (page 55 of 136)

E&E FUEL PRELOAD DATA SHEET

Manufacturer: SBI
Model: Caddy
Run #: 1
Test Date: 1/27/2015

Control# 0
Tech: 0

Test Load Weight:

			Lower	Ideal	Upper
Firebox Volume:	3.25	cu. ft	29.25	32.50	35.75
Load Volume:	0.0000	cu. ft			

Loading Density: 10.812 lbs./ft3

Number of Spaces: 0
Spacer weight: 0

Load Density (wet): #DIV/0! lbs./ft3
Dry Wood Density: #DIV/0!

	Red Oak	White Oak
Species	X	

Piece Size: Thick x Wide x Length	Weight lbs	Meter Moisture Content Dry Uncorrected %			Ave. MC x Weight	Volume Cubic Inches
	5.65	27.50	18.30	19.60	123.17	0.00
	6.38	20.00	20.00	21.30	130.3646667	0.00
	5.66	27.80	20.70	27.50	143.3866667	0.00
	7.24	27.30	24.20	23.30	180.5173333	0.00
	5.18	27.30	18.30	26.10	123.802	0.00
	5.03	25.40	19.30	19.00	106.8036667	0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
				SUM MCxWT	808.0443333	16
						18
						20
						22
						24
						26
						28
						30
						32
						34

Test Load Weight: 35.14 lbs.

Dry Weight: 12.72 kg.

Average Moisture Content: %

Dry: 23.00

25.27
Must be 18-28

Wet: 20.17
must be 15-25

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsPreload Data

Appendix B Data and Calculation forms (page 56 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	12%	20.0	0.002
Total Output	158832	KJ	(from Psychro.Chart)
Total Input	248747	KJ	
EFFIC.	**63.9%**		

Baro	Duct S.P.
30.3	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
0.00	34.0	39.7	21.0	0.5080	0.713	3.084
1.00	33.6	39.1	20.8	0.5080	0.713	3.081
2.00	33.3	39.3	21.2	0.5080	0.713	3.082
3.00	33.0	39.7	21.3	0.5080	0.713	3.084
4.00	32.5	41.2	21.4	0.5080	0.713	3.091
5.00	32.1	42.7	21.0	0.5080	0.713	3.099
6.00	31.6	44.7	21.3	0.5080	0.713	3.108
7.00	31.1	46.4	21.2	0.5715	0.756	3.305
8.00	30.7	47.5	20.9	0.5080	0.713	3.122
9.00	30.2	48.9	20.8	0.5715	0.756	3.319
10.00	29.8	50.2	21.9	0.5715	0.756	3.325
11.00	29.4	51.1	21.2	0.7620	0.873	3.845
12.00	29.0	49.7	21.3	0.8890	0.943	4.144
13.00	28.7	49.6	21.5	0.8890	0.943	4.143
14.00	28.3	49.9	22.6	0.8890	0.943	4.145
15.00	28.0	49.6	21.8	0.8890	0.943	4.143
16.00	27.6	49.5	21.9	0.8890	0.943	4.143
17.00	27.2	49.3	21.1	0.8890	0.943	4.141
18.00	26.8	49.7	22.6	0.8890	0.943	4.144
19.00	26.4	49.8	21.9	0.9525	0.976	4.290
20.00	26.1	49.7	21.7	0.8890	0.943	4.144
21.00	25.6	49.7	21.6	0.9525	0.976	4.290
22.00	25.3	49.9	22.4	0.8890	0.943	4.145
23.00	24.9	49.9	21.9	0.8890	0.943	4.145
24.00	24.5	49.8	21.3	0.8890	0.943	4.144
25.00	24.1	49.7	21.5	0.8890	0.943	4.144
26.00	23.7	50.3	22.7	0.8890	0.943	4.148
27.00	23.3	50.7	22.6	0.8890	0.943	4.150
28.00	22.9	50.5	22.3	0.9525	0.976	4.295
29.00	22.4	50.4	21.5	1.0160	1.008	4.435
30.00	22.0	50.3	21.8	0.9525	0.976	4.294
31.00	21.6	50.6	23.3	0.9525	0.976	4.296
32.00	21.2	50.4	22.4	1.0160	1.008	4.435
33.00	20.8	50.1	22.0	1.0160	1.008	4.433
34.00	20.4	49.9	21.5	1.0160	1.008	4.432
35.00	20.1	49.9	21.5	1.0160	1.008	4.432
36.00	19.7	49.7	22.1	1.0160	1.008	4.430
37.00	19.3	49.3	21.7	1.0160	1.008	4.428
38.00	19.0	48.9	21.2	0.9525	0.976	4.284

2015-01-29 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #3.xlsDirectoutput

Appendix B Data and Calculation forms (page 57 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	12%	20.0	0.002
Total Output	158832	KJ	(from Psychro.Chart)
Total Input	248747	KJ	
EFFIC.	**63.9%**		

Baro	Duct S.P.
30.3	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
39.00	18.6	49.1	22.8	1.0160	1.008	4.426
40.00	18.3	49.0	22.0	1.0160	1.008	4.426
41.00	18.0	49.3	22.1	1.0160	1.008	4.427
42.00	17.6	49.2	21.7	0.9525	0.976	4.286
43.00	17.3	49.2	22.7	0.8890	0.943	4.141
44.00	17.0	49.3	21.7	0.8890	0.943	4.142
45.00	16.7	49.2	21.7	0.8890	0.943	4.141
46.00	16.4	48.7	21.4	0.9525	0.976	4.283
47.00	16.1	48.6	21.4	0.9525	0.976	4.282
48.00	15.8	48.9	22.5	0.9525	0.976	4.284
49.00	15.5	48.6	21.5	0.9525	0.976	4.282
50.00	15.2	48.4	21.4	0.9525	0.976	4.281
51.00	14.9	47.9	21.3	0.8890	0.943	4.133
52.00	14.7	50.1	21.2	0.8890	0.943	4.147
53.00	14.5	50.6	21.7	0.5715	0.756	3.327
54.00	14.2	51.0	21.2	0.5715	0.756	3.329
55.00	13.8	49.2	21.2	0.5715	0.756	3.320
56.00	13.6	48.9	22.4	0.9525	0.976	4.284
57.00	13.3	48.4	21.9	0.8890	0.943	4.136
58.00	13.2	49.7	21.4	0.6350	0.797	3.502
59.00	13.1	49.6	21.3	0.5715	0.756	3.322
60.00	12.9	49.3	21.7	0.5715	0.756	3.321
61.00	12.8	49.1	22.3	0.5715	0.756	3.320
62.00	12.6	48.6	21.1	0.5715	0.756	3.317
63.00	12.4	48.3	21.3	0.5715	0.756	3.316
64.00	12.2	47.7	20.8	0.5715	0.756	3.312
65.00	12.0	47.3	21.2	0.5715	0.756	3.311
66.00	11.9	47.0	21.3	0.5715	0.756	3.309
67.00	11.7	46.6	21.2	0.5715	0.756	3.307
68.00	11.5	46.3	20.9	0.5715	0.756	3.305
69.00	11.3	45.9	20.9	0.5715	0.756	3.303
70.00	11.2	45.6	21.2	0.5715	0.756	3.302
71.00	11.1	45.4	21.2	0.5715	0.756	3.300
72.00	10.9	45.0	20.9	0.5715	0.756	3.299
73.00	10.7	44.5	20.7	0.5715	0.756	3.296
74.00	10.6	44.1	20.4	0.5715	0.756	3.294
75.00	10.5	44.2	21.3	0.5715	0.756	3.294
76.00	10.3	44.1	21.4	0.5715	0.756	3.294
77.00	10.2	43.9	21.1	0.5715	0.756	3.293

2015-01-29 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #3.xlsDirectoutput

Appendix B Data and Calculation forms (page 58 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	12%	20.0	0.002
Total Output	158832	KJ	(from Psychro.Chart)
Total Input	248747	KJ	
EFFIC.	**63.9%**		

Baro	Duct S.P.
30.3	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
78.00	10.0	43.6	21.0	0.5715	0.756	3.291
79.00	9.9	43.5	21.1	0.5715	0.756	3.291
80.00	9.8	43.3	21.1	0.5715	0.756	3.290
81.00	9.6	42.9	20.7	0.5715	0.756	3.288
82.00	9.5	42.8	21.4	0.5715	0.756	3.287
83.00	9.4	43.0	21.6	0.5715	0.756	3.288
84.00	9.2	42.7	21.3	0.5715	0.756	3.287
85.00	9.0	42.4	20.7	0.5715	0.756	3.285
86.00	8.9	42.1	20.8	0.5715	0.756	3.283
87.00	8.8	42.0	21.2	0.5715	0.756	3.283
88.00	8.6	42.0	21.2	0.5715	0.756	3.283
89.00	8.5	41.8	21.1	0.5715	0.756	3.282
90.00	8.4	41.4	20.6	0.5715	0.756	3.280
91.00	8.3	41.3	20.7	0.5715	0.756	3.279
92.00	8.2	41.4	20.9	0.5715	0.756	3.280
93.00	8.0	41.2	21.1	0.5715	0.756	3.279
94.00	7.9	40.8	20.6	0.5715	0.756	3.277
95.00	7.8	40.6	20.4	0.5715	0.756	3.276
96.00	7.7	40.9	21.5	0.5715	0.756	3.277
97.00	7.6	40.7	20.9	0.5715	0.756	3.276
98.00	7.4	40.4	20.5	0.5715	0.756	3.274
99.00	7.4	40.1	20.3	0.5715	0.756	3.273
100.00	7.2	40.2	21.0	0.5080	0.713	3.086
101.00	7.1	39.9	20.8	0.5080	0.713	3.085
102.00	7.0	39.8	20.5	0.5080	0.713	3.084
103.00	6.9	39.5	20.3	0.5080	0.713	3.083
104.00	6.8	39.5	21.2	0.5080	0.713	3.083
105.00	6.7	39.4	21.0	0.5715	0.756	3.269
106.00	6.6	39.1	20.7	0.5715	0.756	3.268
107.00	6.5	39.1	20.9	0.5715	0.756	3.267
108.00	6.4	38.8	21.0	0.5715	0.756	3.266
109.00	6.4	38.7	21.4	0.5715	0.756	3.266
110.00	6.3	38.5	21.0	0.5715	0.756	3.265
111.00	6.2	38.2	20.6	0.5715	0.756	3.263
112.00	6.1	38.0	21.0	0.5715	0.756	3.262
113.00	6.0	38.0	21.0	0.5715	0.756	3.262
114.00	5.9	37.8	20.9	0.5715	0.756	3.261
115.00	5.8	37.5	20.5	0.5715	0.756	3.259
116.00	5.7	37.2	20.5	0.5715	0.756	3.258

2015-01-29 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #3.xlsDirectoutput

Appendix B Data and Calculation forms (page 59 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	12%	20.0	0.002
Total Output	158832	KJ	(from Psychro.Chart)
Total Input	248747	KJ	
EFFIC.	**63.9%**		

Baro	Duct S.P.
30.3	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
117.00	5.7	37.2	20.8	0.5715	0.756	3.258
118.00	5.6	37.1	21.1	0.5715	0.756	3.257
119.00	5.5	36.8	20.6	0.5715	0.756	3.256
120.00	5.5	36.3	20.3	0.5715	0.756	3.253
121.00	5.4	36.2	20.7	0.5715	0.756	3.253
122.00	5.4	36.1	21.5	0.5715	0.756	3.252
123.00	5.3	35.8	20.9	0.5715	0.756	3.251
124.00	5.3	35.5	20.4	0.5715	0.756	3.249
125.00	5.2	35.1	20.5	0.5715	0.756	3.247
126.00	5.1	35.1	20.9	0.5715	0.756	3.247
127.00	5.1	34.8	20.7	0.5715	0.756	3.245
128.00	5.0	34.5	20.3	0.5715	0.756	3.243
129.00	5.1	37.7	20.0	0.5715	0.756	3.261
130.00	4.6	43.4	20.1	0.0000	0.000	0.000
131.00	4.5	37.2	20.2	0.0000	0.000	0.000
132.00	4.6	35.9	20.2	0.5715	0.756	3.251
133.00	4.6	35.3	20.6	0.5715	0.756	3.248
134.00	4.7	34.8	20.5	0.5080	0.713	3.060
135.00	4.8	36.2	20.6	0.5080	0.713	3.066
136.00	4.4	42.6	20.3	0.1270	0.356	1.549
137.00	4.1	38.3	19.9	0.0000	0.000	0.000
138.00	4.2	36.0	20.0	0.5080	0.713	3.065
139.00	4.3	35.4	21.2	0.5080	0.713	3.063
140.00	4.3	34.8	20.3	0.5080	0.713	3.059
141.00	4.4	37.7	20.1	0.5080	0.713	3.074
142.00	4.0	43.1	20.1	0.0000	0.000	0.000
143.00	3.8	37.3	20.4	0.0000	0.000	0.000
144.00	4.0	35.8	20.5	0.5080	0.713	3.064
145.00	4.0	35.0	20.2	0.5080	0.713	3.060
146.00	4.2	36.1	20.3	0.5080	0.713	3.066
147.00	3.9	42.5	19.9	0.0000	0.000	0.000
148.00	3.5	39.8	20.0	0.0000	0.000	0.000
149.00	3.7	35.8	20.2	0.5080	0.713	3.064
150.00	3.8	35.0	20.9	0.5080	0.713	3.061
151.00	4.0	34.9	20.3	0.5080	0.713	3.060
152.00	3.7	41.9	20.2	0.2540	0.504	2.188
153.00	3.3	45.0	20.3	0.0000	0.000	0.000
154.00	3.4	36.2	20.5	0.0000	0.000	0.000
155.00	3.6	35.1	20.6	0.5080	0.713	3.061

2015-01-29 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #3.xlsDirectoutput

Appendix B Data and Calculation forms (page 60 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	12%	20.0	0.002
Total Output	158832	KJ	(from Psychro.Chart)
Total Input	248747	KJ	
EFFIC.	**63.9%**		

Baro	Duct S.P.
30.3	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
156.00	3.8	35.4	20.7	0.5080	0.713	3.063
157.00	3.5	42.2	20.5	0.0000	0.000	0.000
158.00	3.1	45.0	20.1	0.0000	0.000	0.000
159.00	3.2	36.0	20.3	0.5080	0.713	3.065
160.00	3.4	35.0	21.0	0.5080	0.713	3.060
161.00	3.5	37.9	20.6	0.5080	0.713	3.075
162.00	3.2	43.0	20.4	0.0000	0.000	0.000
163.00	2.9	38.2	20.1	0.0000	0.000	0.000
164.00	3.1	35.4	20.5	0.5080	0.713	3.063
165.00	3.4	35.6	20.7	0.5080	0.713	3.063
166.00	3.1	42.2	20.4	0.2540	0.504	2.189
167.00	2.8	44.9	20.0	0.0000	0.000	0.000
168.00	2.9	35.8	20.3	0.5080	0.713	3.064
169.00	3.0	34.7	20.9	0.5080	0.713	3.059
170.00	3.0	41.0	20.3	0.0000	0.000	0.000
171.00	2.7	44.4	20.1	0.0000	0.000	0.000
172.00	2.7	35.9	19.9	0.0000	0.000	0.000
173.00	2.8	34.5	20.4	0.5080	0.713	3.058
174.00	2.9	40.3	20.1	0.5080	0.713	3.087
175.00	2.5	44.1	20.0	0.0000	0.000	0.000
176.00	2.5	36.1	19.9	0.5080	0.713	3.066
177.00	2.7	34.5	19.9	0.5080	0.713	3.058
178.00	2.7	39.9	20.1	0.5080	0.713	3.085
179.00	2.4	43.8	19.9	0.0000	0.000	0.000
180.00	2.3	36.4	19.8	0.0000	0.000	0.000
181.00	2.5	34.5	19.9	0.5080	0.713	3.058
182.00	2.6	39.2	20.0	0.5080	0.713	3.081
183.00	2.3	43.5	19.9	0.0000	0.000	0.000
184.00	2.2	36.7	19.8	0.0000	0.000	0.000
185.00	2.3	34.5	19.7	0.5080	0.713	3.058
186.00	2.4	39.8	19.7	0.5080	0.713	3.084
187.00	2.1	43.7	19.7	0.0000	0.000	0.000
188.00	2.0	36.3	19.7	0.0000	0.000	0.000
189.00	2.2	34.3	19.9	0.5080	0.713	3.057
190.00	2.3	40.2	19.5	0.0000	0.000	0.000
191.00	2.0	43.7	19.6	0.0000	0.000	0.000
192.00	1.8	37.0	19.7	0.5080	0.713	3.070
193.00	2.0	34.4	19.9	0.5080	0.713	3.058
194.00	2.1	39.5	19.5	0.5080	0.713	3.083

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Appendix B Data and Calculation forms (page 61 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	12%	20.0	0.002
Total Output	158832	KJ	(from Psychro.Chart)
Total Input	248747	KJ	
EFFIC.	**63.9%**		

Baro	Duct S.P.
30.3	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
195.00	1.8	43.4	19.5	0.0000	0.000	0.000
196.00	1.7	37.3	20.2	0.0000	0.000	0.000
197.00	1.9	34.4	19.9	0.5080	0.713	3.058
198.00	2.0	39.6	19.6	0.5080	0.713	3.083
199.00	1.7	43.5	19.6	0.0000	0.000	0.000
200.00	1.5	37.1	19.8	0.0000	0.000	0.000
201.00	1.7	34.4	20.0	0.5080	0.713	3.058
202.00	1.8	39.5	19.5	0.5080	0.713	3.083
203.00	1.6	43.3	19.6	0.5080	0.713	3.102
204.00	1.4	38.6	19.9	0.0000	0.000	0.000
205.00	1.6	34.6	20.3	0.5080	0.713	3.059
206.00	1.7	39.1	19.8	0.5080	0.713	3.081
207.00	1.5	43.2	19.7	0.0000	0.000	0.000
208.00	1.3	39.0	19.7	0.0000	0.000	0.000
209.00	1.5	34.6	20.4	0.5080	0.713	3.058
210.00	1.6	39.5	19.5	0.5080	0.713	3.083
211.00	1.4	43.2	19.7	0.0000	0.000	0.000
212.00	1.2	40.8	19.7	0.0000	0.000	0.000
213.00	1.4	34.5	19.9	0.5080	0.713	3.058
214.00	1.5	38.8	19.9	0.5080	0.713	3.079
215.00	1.3	42.9	19.8	0.0000	0.000	0.000
216.00	1.1	44.6	19.8	0.0000	0.000	0.000
217.00	1.3	35.0	20.4	0.5080	0.713	3.060
218.00	1.4	38.0	20.1	0.5080	0.713	3.075
219.00	1.2	42.6	19.8	0.0000	0.000	0.000
220.00	1.0	44.5	19.6	0.0000	0.000	0.000
221.00	1.1	35.1	20.5	0.5080	0.713	3.061
222.00	1.4	37.3	19.8	0.5080	0.713	3.072
223.00	1.1	42.4	19.6	0.0000	0.000	0.000
224.00	0.9	44.2	19.5	0.0000	0.000	0.000
225.00	1.0	35.3	20.1	0.5080	0.713	3.062
226.00	1.3	35.7	19.9	0.5080	0.713	3.064
227.00	1.1	41.9	19.7	0.5080	0.713	3.094
228.00	0.8	44.0	19.5	0.0000	0.000	0.000
229.00	0.9	35.5	20.1	0.0000	0.000	0.000
230.00	1.2	34.7	20.2	0.5080	0.713	3.059
231.00	1.0	41.5	19.8	0.0000	0.000	0.000
232.00	0.8	43.8	19.5	0.0000	0.000	0.000
233.00	0.7	36.1	19.6	0.5080	0.713	3.066

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Appendix B Data and Calculation forms (page 62 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	12%	20.0	0.002
Total Output	158832	KJ	(from Psychro.Chart)
Total Input	248747	KJ	
EFFIC.	**63.9%**		

Baro	Duct S.P.
30.3	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
234.00	0.9	34.1	20.0	0.5080	0.713	3.056
235.00	1.0	40.2	19.8	0.0000	0.000	0.000
236.00	0.7	43.4	19.5	0.0000	0.000	0.000
237.00	0.6	37.8	19.6	0.5080	0.713	3.074
238.00	0.8	34.2	19.8	0.5080	0.713	3.057
239.00	0.9	39.2	19.6	0.5080	0.713	3.081
240.00	0.7	42.9	19.5	0.0000	0.000	0.000
241.00	0.5	40.8	19.4	0.5080	0.713	3.089
242.00	0.7	34.4	20.0	0.5080	0.713	3.057
243.00	0.8	38.6	19.9	0.5080	0.713	3.079
244.00	0.6	42.6	19.6	0.0000	0.000	0.000
245.00	0.4	44.6	19.4	0.0000	0.000	0.000
246.00	0.5	34.7	19.8	0.0000	0.000	0.000
247.00	0.8	38.3	19.7	0.5080	0.713	3.077
248.00	0.5	42.7	19.5	0.0000	0.000	0.000
249.00	0.3	44.7	19.5	0.0000	0.000	0.000
250.00	0.4	34.8	19.6	0.5080	0.713	3.059
251.00	0.7	37.1	19.9	0.5080	0.713	3.071
252.00	0.4	42.3	19.7	0.5080	0.713	3.096
253.00	0.2	44.2	19.3	0.0000	0.000	0.000
254.00	0.4	34.6	19.5	0.0000	0.000	0.000
255.00	0.6	37.1	19.7	0.0000	0.000	0.000
256.00	0.4	42.1	19.7	0.5080	0.713	3.096
257.00	0.2	44.0	19.4	0.0000	0.000	0.000
258.00	0.2	35.1	19.4	0.0000	0.000	0.000
259.00	0.5	35.9	19.8	0.0000	0.000	0.000
260.00	0.3	41.7	19.6	0.5080	0.713	3.094
261.00	0.1	43.8	19.3	0.0000	0.000	0.000
262.00	0.1	35.8	19.6	0.0000	0.000	0.000
263.00	0.4	34.1	20.0	0.0000	0.000	0.000
264.00	0.3	41.0	19.8	0.5080	0.713	3.090
265.00	0.1	43.4	19.5	0.0000	0.000	0.000
266.00	0.0	36.2	19.3	0.0000	0.000	0.000
267.00	0.3	33.7	19.6	0.5080	0.713	3.054
268.00	0.2	40.8	19.6	0.0000	0.000	0.000
269.00	0.0	43.3	19.3	0.0000	0.000	0.000
270.00	-0.1	38.3	19.3	0.0000	0.000	0.000
271.00	0.1	33.8	19.5	0.5080	0.713	3.054
272.00	0.2	39.9	19.4	0.0000	0.000	0.000

2015-01-29 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #3.xlsDirectoutput

Appendix B Data and Calculation forms (page 63 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	12%	20.0	0.002
Total Output	158832	KJ	(from Psychro.Chart)
Total Input	248747	KJ	
EFFIC.	**63.9%**		

Baro	Duct S.P.
30.3	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
273.00	-0.1	42.9	19.3	0.0000	0.000	0.000
274.00	-0.2	44.5	19.2	0.0000	0.000	0.000
275.00	0.0	34.1	19.3	0.0000	0.000	0.000
276.00	0.1	38.9	19.4	0.5080	0.713	3.080
277.00	-0.1	42.6	19.6	0.0000	0.000	0.000
278.00	-0.3	44.2	19.4	0.0000	0.000	0.000
279.00	-0.5	45.9	19.5	0.0000	0.000	0.000
280.00	-0.2	35.0	19.6	0.5080	0.713	3.060

2015-01-29 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #3.xlsDirectoutput

Appendix B Data and Calculation forms (page 64 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Duct area	Test Categ
	30.31	1.0478		0.99	0.1437	
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
0.00	0.443		1920.9	18.94	36,373	34,498
1.00	0.443		1919.1	18.51	35,523	33,692
2.00	0.443		1919.5	18.26	35,060	33,252
3.00	0.443		1920.9	18.62	35,765	33,921
4.00	0.444		1925.6	20.03	38,570	36,582
5.00	0.445		1930.2	21.96	42,393	40,207
6.00	0.447		1936.1	23.58	45,647	43,294
7.00	0.475		2058.9	25.35	52,200	49,509
8.00	0.449		1944.8	26.92	52,349	49,651
9.00	0.477		2067.1	28.34	58,581	55,561
10.00	0.478		2071.4	28.57	59,186	56,135
11.00	0.553		2395.2	30.21	72,356	68,626
12.00	0.596		2581.4	28.63	73,909	70,099
13.00	0.595		2580.8	28.38	73,235	69,460
14.00	0.596		2582.0	27.49	70,985	67,326
15.00	0.595		2580.8	28.02	72,314	68,586
16.00	0.595		2580.5	27.84	71,830	68,128
17.00	0.595		2579.6	28.43	73,332	69,552
18.00	0.596		2581.2	27.35	70,597	66,958
19.00	0.617		2672.4	28.15	75,230	71,352
20.00	0.596		2581.4	28.29	73,038	69,273
21.00	0.616		2671.9	28.40	75,874	71,963
22.00	0.596		2582.2	27.83	71,873	68,168
23.00	0.596		2582.0	28.23	72,902	69,144
24.00	0.596		2581.6	28.71	74,116	70,295
25.00	0.596		2581.5	28.49	73,546	69,755
26.00	0.596		2583.6	27.82	71,882	68,176
27.00	0.596		2585.1	28.31	73,184	69,411
28.00	0.617		2675.3	28.53	76,321	72,387
29.00	0.637		2762.5	29.12	80,447	76,300
30.00	0.617		2674.5	28.78	76,965	72,998
31.00	0.617		2675.8	27.62	73,895	70,086
32.00	0.637		2762.8	28.31	78,213	74,181
33.00	0.637		2761.4	28.45	78,566	74,516
34.00	0.637		2760.6	28.75	79,363	75,272
35.00	0.637		2760.4	28.63	79,030	74,956
36.00	0.637		2759.6	27.92	77,055	73,083
37.00	0.636		2758.0	27.93	77,041	73,069
38.00	0.616		2668.6	27.91	74,482	70,643

2015-01-29 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #3.xlsDirectoutput

Appendix B Data and Calculation forms (page 65 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	30.31	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
39.00	0.636		2756.8	26.54	73,172	69,400
40.00	0.636		2756.6	27.26	75,151	71,278
41.00	0.636		2757.7	27.39	75,526	71,633
42.00	0.616		2669.9	27.81	74,239	70,412
43.00	0.595		2579.5	26.83	69,204	65,637
44.00	0.595		2579.7	27.87	71,906	68,199
45.00	0.595		2579.5	27.78	71,669	67,974
46.00	0.616		2667.9	27.64	73,743	69,942
47.00	0.615		2667.4	27.43	73,173	69,401
48.00	0.616		2668.5	26.60	70,990	67,331
49.00	0.615		2667.2	27.35	72,951	69,190
50.00	0.615		2666.5	27.23	72,604	68,861
51.00	0.594		2574.3	26.94	69,346	65,771
52.00	0.596		2582.9	29.20	75,419	71,531
53.00	0.478		2072.6	29.16	60,440	57,324
54.00	0.478		2073.8	30.09	62,397	59,181
55.00	0.477		2068.1	28.24	58,404	55,393
56.00	0.616		2668.4	26.71	71,276	67,602
57.00	0.594		2576.1	26.79	69,024	65,466
58.00	0.503		2181.6	28.60	62,386	59,170
59.00	0.477		2069.5	28.62	59,234	56,181
60.00	0.477		2068.4	27.89	57,697	54,723
61.00	0.477		2067.8	27.11	56,058	53,168
62.00	0.477		2066.3	27.82	57,479	54,516
63.00	0.476		2065.3	27.24	56,265	53,364
64.00	0.476		2063.3	27.15	56,029	53,141
65.00	0.476		2062.1	26.35	54,343	51,542
66.00	0.476		2061.1	25.99	53,558	50,797
67.00	0.475		2059.7	25.70	52,942	50,213
68.00	0.475		2058.7	25.64	52,791	50,070
69.00	0.475		2057.3	25.20	51,843	49,171
70.00	0.474		2056.5	24.64	50,667	48,055
71.00	0.474		2055.8	24.43	50,216	47,627
72.00	0.474		2054.6	24.36	50,046	47,466
73.00	0.474		2053.1	24.10	49,472	46,922
74.00	0.473		2051.8	23.92	49,079	46,550
75.00	0.473		2051.9	23.12	47,431	44,986
76.00	0.473		2051.7	22.93	47,050	44,625
77.00	0.473		2050.9	23.03	47,236	44,801

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Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	30.31	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
78.00	0.473		2050.1	22.80	46,743	44,333
79.00	0.473		2049.8	22.61	46,339	43,950
80.00	0.473		2049.1	22.42	45,935	43,567
81.00	0.472		2047.9	22.44	45,956	43,587
82.00	0.472		2047.4	21.63	44,289	42,006
83.00	0.473		2048.0	21.54	44,105	41,831
84.00	0.472		2047.2	21.67	44,357	42,070
85.00	0.472		2046.2	21.94	44,893	42,578
86.00	0.472		2045.3	21.50	43,976	41,709
87.00	0.472		2044.9	21.01	42,957	40,742
88.00	0.472		2045.0	21.08	43,116	40,893
89.00	0.472		2044.3	20.95	42,822	40,614
90.00	0.471		2043.0	20.98	42,863	40,653
91.00	0.471		2042.6	20.81	42,513	40,321
92.00	0.471		2043.0	20.74	42,374	40,190
93.00	0.471		2042.4	20.39	41,650	39,503
94.00	0.471		2041.1	20.46	41,757	39,604
95.00	0.471		2040.4	20.38	41,578	39,435
96.00	0.471		2041.3	19.60	40,011	37,949
97.00	0.471		2040.6	19.98	40,775	38,673
98.00	0.471		2039.6	20.03	40,845	38,740
99.00	0.470		2038.6	19.94	40,652	38,557
100.00	0.443		1922.3	19.37	37,243	35,324
101.00	0.443		1921.6	19.30	37,091	35,179
102.00	0.443		1921.3	19.55	37,568	35,631
103.00	0.443		1920.2	19.37	37,199	35,281
104.00	0.443		1920.3	18.54	35,611	33,775
105.00	0.470		2036.4	18.61	37,892	35,938
106.00	0.470		2035.3	18.55	37,760	35,813
107.00	0.470		2035.2	18.29	37,233	35,314
108.00	0.469		2034.4	17.97	36,569	34,684
109.00	0.469		2034.3	17.52	35,636	33,799
110.00	0.469		2033.5	17.68	35,961	34,107
111.00	0.469		2032.4	17.70	35,963	34,109
112.00	0.469		2031.8	17.12	34,784	32,991
113.00	0.469		2031.8	17.12	34,781	32,988
114.00	0.469		2031.2	17.06	34,645	32,859
115.00	0.468		2030.1	17.11	34,742	32,951
116.00	0.468		2029.3	16.90	34,296	32,528

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Appendix B Data and Calculation forms (page 67 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Duct area	Test Categ
	30.31	1.0478		0.99	0.1437	
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
117.00	0.468		2029.3	16.58	33,646	31,911
118.00	0.468		2029.0	16.18	32,834	31,141
119.00	0.468		2027.9	16.40	33,255	31,541
120.00	0.468		2026.3	16.19	32,799	31,108
121.00	0.467		2026.1	15.65	31,705	30,070
122.00	0.467		2025.7	14.81	30,004	28,457
123.00	0.467		2024.8	15.07	30,508	28,935
124.00	0.467		2023.5	15.16	30,677	29,096
125.00	0.467		2022.3	14.73	29,798	28,262
126.00	0.467		2022.3	14.35	29,024	27,528
127.00	0.466		2021.3	14.20	28,699	27,219
128.00	0.466		2020.2	14.29	28,875	27,386
129.00	0.469		2031.0	17.87	36,289	34,418
130.00	0.000		1.9	23.56	44	42
131.00	0.000		1.9	17.16	32	31
132.00	0.467		2025.1	15.90	32,196	30,536
133.00	0.467		2023.1	14.93	30,200	28,643
134.00	0.440		1905.9	14.46	27,563	26,143
135.00	0.441		1910.0	15.74	30,070	28,520
136.00	0.223		964.9	22.55	21,758	20,636
137.00	0.000		1.9	18.50	35	33
138.00	0.441		1909.3	16.08	30,706	29,123
139.00	0.440		1907.7	14.40	27,478	26,061
140.00	0.440		1905.6	14.61	27,843	26,408
141.00	0.442		1914.7	17.77	34,024	32,271
142.00	0.000		1.9	23.17	44	41
143.00	0.000		1.9	17.08	32	31
144.00	0.440		1908.8	15.49	29,577	28,052
145.00	0.440		1906.2	14.92	28,447	26,981
146.00	0.441		1909.8	15.99	30,534	28,960
147.00	0.000		1.9	22.79	43	41
148.00	0.000		1.9	19.95	38	36
149.00	0.440		1908.8	15.80	30,158	28,603
150.00	0.440		1906.5	14.26	27,196	25,794
151.00	0.440		1906.2	14.73	28,079	26,632
152.00	0.314		1362.9	21.82	29,744	28,210
153.00	0.000		1.9	24.86	47	44
154.00	0.000		1.9	15.88	30	28
155.00	0.440		1906.6	14.62	27,870	26,433

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Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	30.31	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
156.00	0.440		1907.7	14.83	28,295	26,836
157.00	0.000		1.9	21.94	41	39
158.00	0.000		1.9	25.18	48	45
159.00	0.441		1909.4	15.80	30,166	28,611
160.00	0.440		1906.4	14.13	26,944	25,555
161.00	0.442		1915.5	17.54	33,598	31,866
162.00	0.000		1.9	22.82	43	41
163.00	0.000		1.9	18.24	34	33
164.00	0.440		1907.7	15.09	28,778	27,295
165.00	0.440		1908.1	14.97	28,568	27,095
166.00	0.315		1363.7	22.00	30,008	28,461
167.00	0.000		1.9	25.19	48	45
168.00	0.440		1908.7	15.63	29,825	28,287
169.00	0.440		1905.3	13.93	26,542	25,174
170.00	0.000		1.9	20.91	39	37
171.00	0.000		1.9	24.55	46	44
172.00	0.000		1.9	16.07	30	29
173.00	0.439		1904.9	14.23	27,106	25,709
174.00	0.444		1922.7	20.38	39,194	37,174
175.00	0.000		1.9	24.34	46	44
176.00	0.441		1909.9	16.40	31,319	29,705
177.00	0.439		1904.7	14.71	28,022	26,578
178.00	0.443		1921.6	20.08	38,583	36,594
179.00	0.000		1.9	24.13	46	43
180.00	0.000		1.9	16.82	32	30
181.00	0.439		1904.7	14.70	27,991	26,548
182.00	0.443		1919.3	19.41	37,262	35,341
183.00	0.000		1.9	23.85	45	43
184.00	0.000		1.9	17.06	32	31
185.00	0.439		1904.7	14.88	28,334	26,873
186.00	0.443		1921.1	20.23	38,858	36,854
187.00	0.000		1.9	24.18	46	43
188.00	0.000		1.9	16.73	32	30
189.00	0.439		1904.1	14.47	27,550	26,129
190.00	0.000		1.9	20.85	39	37
191.00	0.000		1.9	24.33	46	44
192.00	0.441		1912.5	17.43	33,329	31,611
193.00	0.439		1904.6	14.69	27,980	26,538
194.00	0.443		1920.3	20.27	38,930	36,923

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Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Duct area	Test Categ
	30.31	1.0478		0.99	0.1437	
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
195.00	0.000		1.9	24.06	45	43
196.00	0.000		1.9	17.24	33	31
197.00	0.439		1904.5	14.67	27,944	26,504
198.00	0.443		1920.6	20.18	38,752	36,754
199.00	0.000		1.9	24.10	45	43
200.00	0.000		1.9	17.39	33	31
201.00	0.439		1904.6	14.55	27,703	26,275
202.00	0.443		1920.4	20.20	38,798	36,798
203.00	0.446		1931.9	23.96	46,287	43,901
204.00	0.000		1.9	18.90	36	34
205.00	0.440		1905.2	14.45	27,528	26,109
206.00	0.443		1919.1	19.55	37,519	35,585
207.00	0.000		1.9	23.68	45	42
208.00	0.000		1.9	19.45	37	35
209.00	0.440		1905.0	14.35	27,329	25,920
210.00	0.443		1920.2	20.15	38,686	36,692
211.00	0.000		1.9	23.79	45	43
212.00	0.000		1.9	21.38	40	38
213.00	0.439		1904.9	14.79	28,173	26,720
214.00	0.443		1918.1	19.12	36,680	34,789
215.00	0.000		1.9	23.31	44	42
216.00	0.000		1.9	25.05	47	45
217.00	0.440		1906.3	14.70	28,026	26,582
218.00	0.442		1915.6	18.04	34,548	32,768
219.00	0.000		1.9	23.05	43	41
220.00	0.000		1.9	25.16	47	45
221.00	0.440		1906.6	14.72	28,073	26,626
222.00	0.441		1913.3	17.62	33,715	31,977
223.00	0.000		1.9	23.03	43	41
224.00	0.000		1.9	24.94	47	45
225.00	0.440		1907.3	15.39	29,359	27,845
226.00	0.440		1908.6	16.00	30,534	28,960
227.00	0.445		1927.5	22.42	43,217	40,989
228.00	0.000		1.9	24.75	47	44
229.00	0.000		1.9	15.57	29	28
230.00	0.440		1905.5	14.68	27,981	26,539
231.00	0.000		1.9	21.94	41	39
232.00	0.000		1.9	24.59	46	44
233.00	0.441		1909.7	16.67	31,835	30,194

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Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	30.31	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
234.00	0.439		1903.6	14.20	27,039	25,645
235.00	0.000		1.9	20.66	39	37
236.00	0.000		1.9	24.09	45	43
237.00	0.442		1915.0	18.33	35,108	33,299
238.00	0.439		1903.9	14.50	27,602	26,180
239.00	0.443		1919.3	19.77	37,944	35,988
240.00	0.000		1.9	23.67	45	42
241.00	0.444		1924.1	21.55	41,467	39,329
242.00	0.439		1904.5	14.50	27,620	26,196
243.00	0.442		1917.6	18.96	36,351	34,478
244.00	0.000		1.9	23.25	44	42
245.00	0.000		1.9	25.42	48	45
246.00	0.000		1.9	14.97	28	27
247.00	0.442		1916.7	18.78	35,987	34,132
248.00	0.000		1.9	23.44	44	42
249.00	0.000		1.9	25.44	48	46
250.00	0.440		1905.6	15.27	29,101	27,601
251.00	0.441		1912.9	17.38	33,256	31,541
252.00	0.445		1928.7	22.78	43,938	41,673
253.00	0.000		1.9	25.14	47	45
254.00	0.000		1.9	15.23	29	27
255.00	0.000		1.9	17.50	33	31
256.00	0.445		1928.2	22.65	43,669	41,418
257.00	0.000		1.9	24.83	47	44
258.00	0.000		1.9	15.86	30	28
259.00	0.000		1.9	16.28	31	29
260.00	0.445		1927.0	22.31	42,985	40,770
261.00	0.000		1.9	24.74	47	44
262.00	0.000		1.9	16.37	31	29
263.00	0.000		1.9	14.28	27	26
264.00	0.444		1924.9	21.47	41,324	39,194
265.00	0.000		1.9	24.21	46	43
266.00	0.000		1.9	17.08	32	31
267.00	0.439		1902.4	14.21	27,038	25,644
268.00	0.000		1.9	21.45	40	38
269.00	0.000		1.9	24.21	46	43
270.00	0.000		1.9	19.17	36	34
271.00	0.439		1902.6	14.41	27,423	26,009
272.00	0.000		1.9	20.65	39	37

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Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	30.31	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
273.00	0.000		1.9	23.83	45	43
274.00	0.000		1.9	25.53	48	46
275.00	0.000		1.9	14.90	28	27
276.00	0.443		1918.5	19.68	37,761	35,815
277.00	0.000		1.9	23.27	44	42
278.00	0.000		1.9	25.07	47	45
279.00	0.000		1.9	26.59	50	48
280.00	0.440		1906.4	15.59	29,714	28,182

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	ory (1, 2, 3, 4)	4			Target	44730
	Air Density @			Rated Capacity	44730	Btu/hr
	STP			Cat 3	29074.5	Btu/hr
Total Output	1.204	kg/m³		Cat 2	19681.2	Btu/hr
Total Input				Cat 1	13419	Btu/hr
EFFIC.						

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
0.00	0	0	0	0	on	939.0
1.00	599	599	**35,948**	34,095		938.2
2.00	588	1,187	**35,620**	33,783		938.4
3.00	590	1,778	**35,550**	33,718		939.0
4.00	619	2,397	**35,954**	34,101		941.3
5.00	675	3,072	**36,859**	34,959		943.6
6.00	734	3,805	**38,052**	36,091		946.5
7.00	814	4,620	**39,597**	37,556		1006.5
8.00	872	5,492	**41,188**	39,065		950.7
9.00	924	6,415	**42,769**	40,565		1010.5
10.00	981	7,397	**44,381**	42,093		1012.6
11.00	1,094	8,491	**46,313**	43,926		1170.9
12.00	1,220	9,711	**48,554**	46,051		1261.9
13.00	1,226	10,937	**50,479**	47,877		1261.6
14.00	1,202	12,139	**52,024**	49,342		1262.2
15.00	1,194	13,333	**53,332**	50,583		1261.7
16.00	1,201	14,534	**54,503**	51,694		1261.5
17.00	1,210	15,744	**55,567**	52,702		1261.0
18.00	1,199	16,943	**56,478**	53,566		1261.8
19.00	1,215	18,158	**57,342**	54,386		1306.4
20.00	1,236	19,394	**58,182**	55,182		1261.9
21.00	1,241	20,635	**58,957**	55,917		1306.2
22.00	1,231	21,866	**59,634**	56,560		1262.3
23.00	1,206	23,072	**60,188**	57,086		1262.2
24.00	1,225	24,297	**60,743**	57,612		1262.0
25.00	1,231	25,528	**61,267**	58,109		1262.0
26.00	1,212	26,740	**61,707**	58,526		1263.0
27.00	1,209	27,949	**62,108**	58,907		1263.8
28.00	1,246	29,194	**62,560**	59,335		1307.8
29.00	1,306	30,501	**63,105**	59,852		1350.4
30.00	1,312	31,812	**63,625**	60,345		1307.4
31.00	1,257	33,069	**64,005**	60,706		1308.1
32.00	1,267	34,337	**64,382**	61,063		1350.6
33.00	1,306	35,643	**64,806**	61,465		1349.9
34.00	1,316	36,959	**65,222**	61,860		1349.5
35.00	1,320	38,279	**65,622**	62,239		1349.4
36.00	1,301	39,580	**65,967**	62,566		1349.0
37.00	1,284	40,864	**66,266**	62,850		1348.3
38.00	1,263	42,127	**66,516**	63,087		1304.5

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Appendix B Data and Calculation forms (page 73 of 136)

	ory (1, 2, 3, 4)	4		Target	44730
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	19681.2	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
39.00	1,231	43,358	**66,704**	63,266		1347.7
40.00	1,236	44,594	**66,891**	63,443		1347.6
41.00	1,256	45,849	**67,097**	63,638		1348.1
42.00	1,248	47,098	**67,282**	63,814		1305.2
43.00	1,195	48,293	**67,385**	63,911		1261.0
44.00	1,176	49,469	**67,457**	63,980		1261.1
45.00	1,196	50,665	**67,553**	64,071		1261.0
46.00	1,212	51,877	**67,665**	64,177		1304.2
47.00	1,224	53,101	**67,789**	64,294		1304.0
48.00	1,201	54,302	**67,878**	64,379		1304.5
49.00	1,200	55,502	**67,962**	64,458		1303.9
50.00	1,213	56,715	**68,058**	64,550		1303.5
51.00	1,183	57,898	**68,115**	64,604		1258.5
52.00	1,206	59,104	**68,197**	64,682		1262.7
53.00	1,132	60,236	**68,192**	64,677		1013.2
54.00	1,024	61,260	**68,066**	64,558		1013.8
55.00	1,007	62,266	**67,927**	64,425		1011.0
56.00	1,084	63,351	**67,876**	64,377		1304.5
57.00	1,169	64,520	**67,916**	64,415		1259.4
58.00	1,098	65,618	**67,881**	64,382		1066.5
59.00	1,014	66,632	**67,761**	64,268		1011.7
60.00	974	67,606	**67,606**	64,121		1011.1
61.00	948	68,554	**67,430**	63,954		1010.9
62.00	946	69,500	**67,258**	63,791		1010.1
63.00	948	70,448	**67,093**	63,635		1009.6
64.00	936	71,384	**66,922**	63,473		1008.7
65.00	920	72,304	**66,742**	63,301		1008.1
66.00	899	73,203	**66,548**	63,118		1007.6
67.00	887	74,090	**66,349**	62,929		1006.9
68.00	881	74,971	**66,151**	62,741		1006.4
69.00	872	75,843	**65,951**	62,551		1005.7
70.00	854	76,698	**65,741**	62,352		1005.3
71.00	841	77,538	**65,525**	62,148		1005.0
72.00	836	78,374	**65,311**	61,945		1004.4
73.00	829	79,203	**65,098**	61,743		1003.6
74.00	821	80,024	**64,885**	61,540		1003.0
75.00	804	80,829	**64,663**	61,330		1003.1
76.00	787	81,616	**64,434**	61,112		1003.0
77.00	786	82,402	**64,209**	60,899		1002.6

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Appendix B Data and Calculation forms (page 74 of 136)

	ory (1, 2, 3, 4)	4		Target	44730
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	19681.2	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
78.00	783	83,185	**63,988**	60,690		1002.2
79.00	776	83,960	**63,767**	60,480		1002.0
80.00	769	84,729	**63,547**	60,271		1001.7
81.00	766	85,495	**63,330**	60,065		1001.1
82.00	752	86,247	**63,108**	59,855		1000.9
83.00	737	86,984	**62,880**	59,639		1001.2
84.00	737	87,721	**62,658**	59,428		1000.8
85.00	744	88,465	**62,446**	59,227		1000.3
86.00	741	89,205	**62,236**	59,028		999.8
87.00	724	89,930	**62,021**	58,823		999.7
88.00	717	90,647	**61,805**	58,619		999.7
89.00	716	91,363	**61,593**	58,418		999.3
90.00	714	92,077	**61,385**	58,221		998.7
91.00	711	92,789	**61,179**	58,026		998.5
92.00	707	93,496	**60,976**	57,833		998.7
93.00	700	94,196	**60,772**	57,639		998.4
94.00	695	94,891	**60,569**	57,447		997.8
95.00	694	95,586	**60,370**	57,258		997.4
96.00	680	96,266	**60,166**	57,065		997.9
97.00	673	96,939	**59,962**	56,871		997.6
98.00	680	97,619	**59,767**	56,686		997.1
99.00	679	98,298	**59,575**	56,504		996.6
100.00	649	98,947	**59,368**	56,308		939.7
101.00	619	99,567	**59,148**	56,099		939.4
102.00	622	100,189	**58,935**	55,897		939.2
103.00	623	100,812	**58,725**	55,698		938.7
104.00	607	101,419	**58,511**	55,495		938.7
105.00	612	102,031	**58,303**	55,298		995.5
106.00	630	102,661	**58,110**	55,115		995.0
107.00	625	103,286	**57,918**	54,932		994.9
108.00	615	103,901	**57,723**	54,747		994.5
109.00	602	104,503	**57,525**	54,559		994.5
110.00	597	105,100	**57,327**	54,372		994.1
111.00	599	105,699	**57,135**	54,189		993.5
112.00	590	106,289	**56,940**	54,005		993.2
113.00	580	106,868	**56,744**	53,819		993.3
114.00	579	107,447	**56,551**	53,636		992.9
115.00	578	108,025	**56,361**	53,456		992.4
116.00	575	108,600	**56,173**	53,277		992.0

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Appendix B Data and Calculation forms (page 75 of 136)

	ory (1, 2, 3, 4)	4		Target	44730
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	19681.2	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
117.00	566	109,167	**55,983**	53,097		992.0
118.00	554	109,721	**55,790**	52,914		991.9
119.00	551	110,271	**55,599**	52,733		991.3
120.00	550	110,822	**55,411**	52,555		990.6
121.00	538	111,359	**55,220**	52,373		990.4
122.00	514	111,874	**55,020**	52,184		990.3
123.00	504	112,378	**54,818**	51,993		989.8
124.00	510	112,888	**54,623**	51,807		989.2
125.00	504	113,392	**54,428**	51,622		988.6
126.00	490	113,882	**54,229**	51,434		988.6
127.00	481	114,363	**54,030**	51,245		988.1
128.00	480	114,843	**53,833**	51,058		987.6
129.00	543	115,386	**53,668**	50,901		992.9
130.00	351	115,737	**53,417**	50,663		0.9
131.00	1	115,737	**53,009**	50,277		0.9
132.00	279	116,016	**52,735**	50,016		990.0
133.00	520	116,536	**52,573**	49,863		989.0
134.00	481	117,017	**52,396**	49,695		931.7
135.00	480	117,498	**52,221**	49,529		933.7
136.00	459	117,956	**52,040**	49,357		471.7
137.00	165	118,122	**51,732**	49,065		0.9
138.00	275	118,397	**51,477**	48,823		933.4
139.00	485	118,882	**51,316**	48,671		932.6
140.00	461	119,343	**51,147**	48,510		931.6
141.00	515	119,858	**51,004**	48,374		936.0
142.00	327	120,185	**50,783**	48,165		0.9
143.00	1	120,186	**50,428**	47,828		0.9
144.00	259	120,445	**50,186**	47,599		933.1
145.00	484	120,929	**50,040**	47,460		931.9
146.00	491	121,420	**49,899**	47,327		933.6
147.00	309	121,729	**49,685**	47,124		0.9
148.00	1	121,730	**49,350**	46,806		0.9
149.00	285	122,015	**49,133**	46,601		933.1
150.00	478	122,493	**48,997**	46,471		932.0
151.00	461	122,953	**48,856**	46,337		931.8
152.00	498	123,451	**48,731**	46,219		666.3
153.00	266	123,717	**48,516**	46,015		0.9
154.00	1	123,717	**48,202**	45,717		0.9
155.00	243	123,960	**47,984**	45,511		932.1

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Appendix B Data and Calculation forms (page 76 of 136)

	ory (1, 2, 3, 4)	4		Target	44730
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	19681.2	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
156.00	468	124,428	**47,857**	45,390		932.6
157.00	293	124,720	**47,664**	45,207		0.9
158.00	1	124,721	**47,362**	44,921		0.9
159.00	326	125,047	**47,188**	44,755		933.4
160.00	476	125,523	**47,071**	44,645		931.9
161.00	504	126,028	**46,967**	44,546		936.4
162.00	322	126,350	**46,796**	44,384		0.9
163.00	1	126,351	**46,509**	44,112		0.9
164.00	265	126,616	**46,323**	43,935		932.6
165.00	478	127,094	**46,216**	43,834		932.8
166.00	504	127,598	**46,120**	43,742		666.6
167.00	269	127,866	**45,940**	43,572		0.9
168.00	325	128,191	**45,783**	43,423		933.1
169.00	470	128,661	**45,679**	43,324		931.4
170.00	277	128,938	**45,508**	43,162		0.9
171.00	1	128,939	**45,242**	42,910		0.9
172.00	1	128,939	**44,979**	42,660		0.9
173.00	241	129,180	**44,802**	42,493		931.2
174.00	552	129,732	**44,735**	42,429		939.9
175.00	359	130,091	**44,603**	42,303		0.9
176.00	324	130,415	**44,460**	42,168		933.7
177.00	494	130,910	**44,376**	42,089		931.1
178.00	555	131,464	**44,314**	42,030		939.4
179.00	354	131,819	**44,185**	41,907		0.9
180.00	1	131,819	**43,940**	41,675		0.9
181.00	250	132,070	**43,780**	41,523		931.1
182.00	543	132,613	**43,719**	41,465		938.2
183.00	346	132,960	**43,593**	41,346		0.9
184.00	1	132,960	**43,357**	41,122		0.9
185.00	254	133,214	**43,205**	40,977		931.1
186.00	560	133,773	**43,153**	40,928		939.1
187.00	356	134,129	**43,036**	40,818		0.9
188.00	1	134,130	**42,807**	40,601		0.9
189.00	248	134,378	**42,660**	40,461		930.8
190.00	280	134,658	**42,524**	40,332		0.9
191.00	1	134,659	**42,301**	40,121		0.9
192.00	333	134,992	**42,185**	40,010		934.9
193.00	511	135,503	**42,125**	39,954		931.0
194.00	557	136,060	**42,080**	39,911		938.8

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Appendix B Data and Calculation forms (page 77 of 136)

	ory (1, 2, 3, 4)	4		Target	44730
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	19681.2	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
195.00	355	136,415	**41,974**	39,810		0.9
196.00	1	136,416	**41,760**	39,607		0.9
197.00	253	136,669	**41,625**	39,479		931.0
198.00	555	137,225	**41,583**	39,440		938.9
199.00	355	137,579	**41,481**	39,343		0.9
200.00	1	137,580	**41,274**	39,146		0.9
201.00	254	137,834	**41,144**	39,023		931.1
202.00	554	138,387	**41,105**	38,986		938.8
203.00	709	139,096	**41,112**	38,993		944.4
204.00	345	139,442	**41,012**	38,898		0.9
205.00	265	139,707	**40,890**	38,782		931.4
206.00	542	140,248	**40,849**	38,743		938.1
207.00	346	140,595	**40,752**	38,651		0.9
208.00	1	140,595	**40,556**	38,466		0.9
209.00	269	140,864	**40,439**	38,355		931.3
210.00	550	141,414	**40,404**	38,321		938.7
211.00	352	141,765	**40,312**	38,234		0.9
212.00	1	141,766	**40,122**	38,054		0.9
213.00	287	142,054	**40,015**	37,952		931.2
214.00	540	142,594	**39,980**	37,919		937.7
215.00	339	142,933	**39,888**	37,832		0.9
216.00	1	142,934	**39,704**	37,657		0.9
217.00	316	143,250	**39,608**	37,567		931.9
218.00	521	143,771	**39,570**	37,530		936.4
219.00	328	144,100	**39,479**	37,444		0.9
220.00	1	144,100	**39,300**	37,274		0.9
221.00	317	144,417	**39,208**	37,187		932.1
222.00	515	144,932	**39,171**	37,152		935.3
223.00	324	145,257	**39,083**	37,068		0.9
224.00	1	145,257	**38,908**	36,903		0.9
225.00	321	145,578	**38,821**	36,820		932.4
226.00	499	146,077	**38,782**	36,782		933.0
227.00	614	146,691	**38,773**	36,774		942.3
228.00	379	147,071	**38,703**	36,708		0.9
229.00	1	147,071	**38,534**	36,548		0.9
230.00	240	147,312	**38,429**	36,448		931.5
231.00	291	147,603	**38,338**	36,362		0.9
232.00	1	147,604	**38,173**	36,206		0.9
233.00	329	147,932	**38,094**	36,130		933.6

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Appendix B Data and Calculation forms (page 78 of 136)

	ory (1, 2, 3, 4)	4		Target	44730
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	19681.2	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
234.00	491	148,423	**38,057**	36,095		930.6
235.00	277	148,700	**37,966**	36,009		0.9
236.00	1	148,700	**37,805**	35,856		0.9
237.00	339	149,039	**37,731**	35,786		936.1
238.00	522	149,562	**37,705**	35,761		930.7
239.00	546	150,107	**37,684**	35,741		938.2
240.00	348	150,455	**37,614**	35,675		0.9
241.00	363	150,818	**37,548**	35,613		940.6
242.00	575	151,393	**37,535**	35,601		931.0
243.00	533	151,926	**37,513**	35,579		937.4
244.00	338	152,264	**37,442**	35,512		0.9
245.00	1	152,264	**37,289**	35,367		0.9
246.00	1	152,265	**37,138**	35,223		0.9
247.00	270	152,535	**37,053**	35,143		937.0
248.00	337	152,872	**36,985**	35,079		0.9
249.00	1	152,873	**36,837**	34,938		0.9
250.00	324	153,197	**36,767**	34,872		931.6
251.00	520	153,716	**36,745**	34,851		935.1
252.00	643	154,359	**36,752**	34,858		942.9
253.00	385	154,744	**36,698**	34,807		0.9
254.00	1	154,745	**36,554**	34,670		0.9
255.00	1	154,746	**36,411**	34,534		0.9
256.00	323	155,068	**36,344**	34,471		942.6
257.00	382	155,450	**36,292**	34,421		0.9
258.00	1	155,451	**36,151**	34,288		0.9
259.00	1	155,451	**36,012**	34,156		0.9
260.00	310	155,762	**35,945**	34,092		942.0
261.00	378	156,140	**35,894**	34,044		0.9
262.00	1	156,140	**35,757**	33,914		0.9
263.00	0	156,141	**35,621**	33,785		0.9
264.00	287	156,428	**35,552**	33,719		941.0
265.00	367	156,794	**35,501**	33,671		0.9
266.00	1	156,795	**35,367**	33,544		0.9
267.00	248	157,043	**35,291**	33,471		930.0
268.00	283	157,326	**35,222**	33,407		0.9
269.00	1	157,327	**35,092**	33,283		0.9
270.00	1	157,328	**34,962**	33,159		0.9
271.00	267	157,594	**34,892**	33,093		930.1
272.00	278	157,872	**34,825**	33,030		0.9

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Appendix B Data and Calculation forms (page 79 of 136)

	ory (1, 2, 3, 4)	4		Target	44730
	Air Density @		Rated Capacity	44730	Btu/hr
	STP		Cat 3	29074.5	Btu/hr
Total Output	1.204	kg/m³	Cat 2	19681.2	Btu/hr
Total Input			Cat 1	13419	Btu/hr
EFFIC.					

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
273.00	1	157,873	**34,697**	32,909		0.9
274.00	1	157,874	**34,571**	32,789		0.9
275.00	1	157,875	**34,445**	32,670		0.9
276.00	277	158,151	**34,381**	32,608		937.9
277.00	344	158,495	**34,331**	32,561		0.9
278.00	1	158,496	**34,208**	32,444		0.9
279.00	1	158,497	**34,085**	32,328		0.9
280.00	335	158,832	**34,035**	32,281		931.9

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Appendix B Data and Calculation forms (page 80 of 136)

E&E FUEL PRELOAD DATA SHEET

Manufacturer: SBI
Model: Caddy
Run #: 1
Test Date: 1/27/2015

Control# 0
Tech: 0

Test Load Weight:

			Lower	Ideal	Upper
Firebox Volume:	3.25	cu. ft	29.25	32.50	35.75

Load Volume: 0.0000 cu. ft

Loading Density: 10.812 lbs./ft3

Number of Spaces: 0
Spacer weight: 0

Load Density (wet): #DIV/0! lbs./ft3
Dry Wood Density: #DIV/0!

	Red Oak	White Oak
Species	X	

Piece Size: Thick x Wide x Length	Weight lbs	Meter Moisture Content Dry Uncorrected %			Ave. MC x Weight	Volume Cubic Inches
	5.65	27.50	18.30	19.60	123.17	0.00
	6.38	20.00	20.00	21.30	130.3646667	0.00
	5.66	27.80	20.70	27.50	143.3866667	0.00
	7.24	27.30	24.20	23.30	180.5173333	0.00
	5.18	27.30	18.30	26.10	123.802	0.00
	5.03	25.40	19.30	19.00	106.8036667	0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
				SUM MCxWT	808.0443333	16
						18
						20
						22
						24
						26
						28
						30
						32
						34

Test Load Weight: 35.14 lbs.

Dry Weight: 12.72 kg.

Average Moisture Content: %

Dry: 23.00

25.27
Must be 18-28

Wet: 20.17
must be 15-25

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsPreload Data

Appendix B Data and Calculation forms (page 81 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	14%	18.5	0.002
Total Output	173414	KJ	(from Psychro.Chart)
Total Input	255292	KJ	
EFFIC.	**67.9%**		

Baro	Duct S.P.
29.83	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
0.00	34.9	40.6	21.9	0.5715	0.756	3.301
1.00	34.5	40.5	21.3	0.6350	0.797	3.479
2.00	34.1	40.8	21.2	0.6350	0.797	3.481
3.00	33.7	41.8	20.8	0.5715	0.756	3.308
4.00	33.2	43.7	20.9	0.6350	0.797	3.497
5.00	32.8	45.2	21.4	0.6350	0.797	3.505
6.00	32.4	46.2	21.5	0.6350	0.797	3.511
7.00	32.0	47.0	20.7	0.6350	0.797	3.515
8.00	31.6	48.1	21.8	0.6350	0.797	3.521
9.00	31.3	48.9	21.5	0.6350	0.797	3.526
10.00	30.9	49.6	21.3	0.6350	0.797	3.529
11.00	30.5	50.3	20.8	0.6350	0.797	3.533
12.00	30.1	50.8	21.1	0.6350	0.797	3.536
13.00	29.7	49.9	21.4	0.6350	0.797	3.531
14.00	29.3	49.6	22.0	0.9525	0.976	4.322
15.00	28.9	49.4	22.1	0.9525	0.976	4.321
16.00	28.6	49.3	22.4	0.9525	0.976	4.320
17.00	28.2	49.3	21.8	0.9525	0.976	4.320
18.00	27.8	49.5	21.7	0.9525	0.976	4.322
19.00	27.5	49.4	22.6	0.9525	0.976	4.321
20.00	27.1	49.6	22.3	1.0160	1.008	4.464
21.00	26.7	50.0	23.1	1.0160	1.008	4.467
22.00	26.3	49.8	22.1	0.9525	0.976	4.324
23.00	26.0	49.8	22.1	0.9525	0.976	4.324
24.00	25.6	49.5	21.7	1.0160	1.008	4.463
25.00	25.3	49.3	22.7	0.9525	0.976	4.320
26.00	25.0	49.4	22.8	0.9525	0.976	4.321
27.00	24.7	48.9	22.3	1.0160	1.008	4.459
28.00	24.4	50.4	21.7	0.9525	0.976	4.328
29.00	24.2	50.8	21.6	0.6350	0.797	3.536
30.00	23.8	49.6	22.7	0.6350	0.797	3.529
31.00	23.5	49.0	22.4	0.9525	0.976	4.319
32.00	23.2	48.4	22.5	0.9525	0.976	4.315
33.00	23.0	49.2	21.6	0.9525	0.976	4.320
34.00	22.7	49.8	22.0	0.6350	0.797	3.530
35.00	22.5	49.9	21.6	0.6350	0.797	3.531
36.00	22.2	49.8	21.5	0.6350	0.797	3.530
37.00	22.0	49.9	21.4	0.6350	0.797	3.531
38.00	21.7	49.6	21.1	0.6350	0.797	3.529

2015-01-30 - Caddy B415.1 - Test results - B415.1 spreadsheet - Run #4.xlsDirectoutput

Appendix B Data and Calculation forms (page 82 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	14%	18.5	0.002
Total Output	173414	KJ	(from Psychro.Chart)
Total Input	255292	KJ	
EFFIC.	**67.9%**		

Baro	Duct S.P.
29.83	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
39.00	21.5	49.6	21.4	0.6350	0.797	3.529
40.00	21.3	49.7	21.5	0.5715	0.756	3.349
41.00	21.0	49.4	21.8	0.6350	0.797	3.528
42.00	20.7	49.3	21.7	0.6350	0.797	3.528
43.00	20.5	49.0	21.4	0.6350	0.797	3.526
44.00	20.2	48.9	21.2	0.6350	0.797	3.525
45.00	20.0	48.8	21.4	0.6350	0.797	3.525
46.00	19.7	48.4	20.7	0.6350	0.797	3.523
47.00	19.5	48.4	21.1	0.6350	0.797	3.522
48.00	19.3	48.3	21.6	0.6350	0.797	3.522
49.00	19.0	48.2	21.7	0.6350	0.797	3.522
50.00	18.7	48.2	21.6	0.6350	0.797	3.521
51.00	18.5	47.8	21.4	0.6350	0.797	3.519
52.00	18.3	47.9	21.5	0.6350	0.797	3.520
53.00	18.0	47.5	21.8	0.6350	0.797	3.518
54.00	17.8	47.4	21.3	0.6350	0.797	3.517
55.00	17.6	46.9	20.8	0.6350	0.797	3.515
56.00	17.3	47.0	21.6	0.6350	0.797	3.515
57.00	17.1	47.0	21.6	0.6350	0.797	3.515
58.00	16.9	46.8	21.7	0.6350	0.797	3.514
59.00	16.6	46.4	20.9	0.6350	0.797	3.512
60.00	16.4	46.1	21.2	0.6350	0.797	3.510
61.00	16.2	46.2	22.0	0.6350	0.797	3.511
62.00	16.0	46.1	21.2	0.6350	0.797	3.510
63.00	15.8	46.0	21.5	0.6350	0.797	3.510
64.00	15.6	45.7	21.4	0.6350	0.797	3.508
65.00	15.4	45.8	21.6	0.6350	0.797	3.508
66.00	15.2	45.7	21.8	0.6350	0.797	3.508
67.00	15.0	45.6	21.8	0.6350	0.797	3.507
68.00	14.7	45.2	20.9	0.6350	0.797	3.505
69.00	14.5	45.4	21.4	0.6350	0.797	3.506
70.00	14.3	45.3	21.6	0.6350	0.797	3.506
71.00	14.1	45.3	21.5	0.6350	0.797	3.506
72.00	13.9	45.2	21.2	0.6350	0.797	3.505
73.00	13.7	44.8	20.8	0.6350	0.797	3.503
74.00	13.5	45.0	21.5	0.6350	0.797	3.504
75.00	13.3	45.0	21.4	0.6350	0.797	3.504
76.00	13.1	44.9	21.8	0.6350	0.797	3.504
77.00	12.9	44.6	20.9	0.6350	0.797	3.502

2015-01-30 - Caddy B415.1 - Test results - B415.1 spreadsheet - Run #4.xlsDirectoutput

Appendix B Data and Calculation forms (page 83 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	14%	18.5	0.002
Total Output	173414	KJ	(from Psychro.Chart)
Total Input	255292	KJ	
EFFIC.	**67.9%**		

Baro	Duct S.P.
29.83	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
78.00	12.7	44.7	21.4	0.6350	0.797	3.502
79.00	12.5	44.7	22.0	0.6350	0.797	3.502
80.00	12.3	44.7	21.3	0.6350	0.797	3.502
81.00	12.1	44.4	20.6	0.6350	0.797	3.501
82.00	11.9	44.5	21.1	0.6350	0.797	3.501
83.00	11.7	44.6	21.4	0.6350	0.797	3.502
84.00	11.5	44.6	21.8	0.6350	0.797	3.502
85.00	11.3	44.6	21.2	0.6350	0.797	3.502
86.00	11.2	44.3	20.9	0.6350	0.797	3.500
87.00	11.0	44.5	21.6	0.6350	0.797	3.501
88.00	10.8	44.4	21.4	0.6350	0.797	3.501
89.00	10.6	44.4	21.6	0.6350	0.797	3.501
90.00	10.4	44.1	21.0	0.6350	0.797	3.499
91.00	10.2	44.1	21.3	0.6350	0.797	3.499
92.00	10.0	44.4	21.8	0.6350	0.797	3.501
93.00	9.9	44.3	21.5	0.6350	0.797	3.500
94.00	9.7	44.0	21.1	0.6350	0.797	3.499
95.00	9.5	44.0	21.1	0.6350	0.797	3.499
96.00	9.3	44.2	22.1	0.6350	0.797	3.500
97.00	9.1	44.3	22.0	0.6350	0.797	3.500
98.00	8.9	44.2	21.5	0.6350	0.797	3.500
99.00	8.8	44.0	21.1	0.6350	0.797	3.499
100.00	8.6	44.1	21.3	0.6350	0.797	3.499
101.00	8.4	44.2	21.6	0.6350	0.797	3.500
102.00	8.3	44.2	21.4	0.6350	0.797	3.500
103.00	8.1	44.0	20.9	0.6350	0.797	3.498
104.00	7.9	43.9	21.4	0.6350	0.797	3.498
105.00	7.8	44.1	21.7	0.6350	0.797	3.499
106.00	7.6	43.9	21.6	0.6350	0.797	3.498
107.00	7.5	43.7	21.2	0.6350	0.797	3.497
108.00	7.3	43.6	21.1	0.6350	0.797	3.496
109.00	7.2	43.6	21.2	0.6350	0.797	3.496
110.00	7.0	43.5	21.6	0.6350	0.797	3.496
111.00	6.9	43.5	21.7	0.6350	0.797	3.496
112.00	6.7	43.2	21.2	0.6350	0.797	3.494
113.00	6.6	43.4	21.9	0.6350	0.797	3.495
114.00	6.5	43.2	21.4	0.6350	0.797	3.494
115.00	6.3	43.0	21.4	0.6350	0.797	3.493
116.00	6.2	42.7	20.9	0.6350	0.797	3.491

2015-01-30 - Caddy B415.1 - Test results - B415.1 spreadsheet - Run #4.xlsDirectoutput

Appendix B Data and Calculation forms (page 84 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	14%	18.5	0.002
Total Output	173414	KJ	(from Psychro.Chart)
Total Input	255292	KJ	
EFFIC.	**67.9%**		

Baro	Duct S.P.
29.83	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
117.00	6.1	42.5	21.1	0.6350	0.797	3.490
118.00	6.0	42.6	21.4	0.6350	0.797	3.491
119.00	5.9	42.4	21.4	0.6350	0.797	3.490
120.00	5.7	42.2	21.3	0.6350	0.797	3.489
121.00	5.6	41.9	21.0	0.6350	0.797	3.487
122.00	5.5	42.1	22.3	0.6350	0.797	3.488
123.00	5.4	42.0	21.4	0.6350	0.797	3.488
124.00	5.3	41.9	21.5	0.6350	0.797	3.487
125.00	5.2	41.6	21.2	0.6350	0.797	3.485
126.00	5.1	41.5	21.2	0.6350	0.797	3.485
127.00	4.9	41.7	21.5	0.6350	0.797	3.486
128.00	4.8	41.7	21.5	0.6350	0.797	3.486
129.00	4.7	41.5	21.2	0.6350	0.797	3.485
130.00	4.6	41.5	21.3	0.6350	0.797	3.485
131.00	4.5	41.5	21.7	0.6350	0.797	3.485
132.00	4.4	41.5	21.9	0.6350	0.797	3.485
133.00	4.3	41.4	21.8	0.6350	0.797	3.484
134.00	4.2	41.1	21.0	0.6350	0.797	3.483
135.00	4.2	41.1	21.3	0.6350	0.797	3.483
136.00	4.1	41.1	21.3	0.6350	0.797	3.482
137.00	4.0	41.0	21.2	0.6350	0.797	3.482
138.00	3.9	40.8	21.0	0.6350	0.797	3.481
139.00	3.8	40.6	21.3	0.6350	0.797	3.480
140.00	3.8	40.7	21.9	0.6350	0.797	3.480
141.00	3.7	40.5	21.7	0.6350	0.797	3.479
142.00	3.6	40.2	20.8	0.6350	0.797	3.478
143.00	3.6	40.0	21.3	0.6350	0.797	3.476
144.00	3.5	40.2	21.9	0.6350	0.797	3.478
145.00	3.4	40.0	21.4	0.6350	0.797	3.477
146.00	3.4	40.0	21.3	0.5715	0.756	3.298
147.00	3.3	39.8	21.5	0.6350	0.797	3.475
148.00	3.3	39.8	21.6	0.6350	0.797	3.475
149.00	3.2	39.8	21.3	0.6350	0.797	3.475
150.00	3.2	39.6	21.5	0.6350	0.797	3.474
151.00	3.1	39.3	20.9	0.6350	0.797	3.472
152.00	3.0	39.4	21.8	0.6350	0.797	3.473
153.00	3.0	39.4	21.7	0.6350	0.797	3.473
154.00	2.9	39.3	21.3	0.6350	0.797	3.473
155.00	2.8	39.1	21.6	0.5715	0.756	3.294

2015-01-30 - Caddy B415.1 - Test results - B415.1 spreadsheet - Run #4.xlsDirectoutput

Appendix B Data and Calculation forms (page 85 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	14%	18.5	0.002
Total Output	173414	KJ	(from Psychro.Chart)
Total Input	255292	KJ	
EFFIC.	**67.9%**		

Baro	Duct S.P.
29.83	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
156.00	2.8	39.1	21.3	0.5715	0.756	3.293
157.00	2.7	39.0	21.3	0.6350	0.797	3.471
158.00	2.7	39.0	21.5	0.6350	0.797	3.471
159.00	2.6	38.8	21.9	0.5715	0.756	3.292
160.00	2.5	38.5	21.1	0.6350	0.797	3.468
161.00	2.5	38.5	21.2	0.6350	0.797	3.468
162.00	2.4	38.3	21.3	0.6350	0.797	3.467
163.00	2.4	38.1	21.1	0.6350	0.797	3.466
164.00	2.3	38.0	21.5	0.6350	0.797	3.465
165.00	2.3	37.8	21.4	0.6350	0.797	3.464
166.00	2.2	37.9	21.7	0.6350	0.797	3.465
167.00	2.2	37.7	21.7	0.6350	0.797	3.464
168.00	2.1	37.6	21.7	0.5715	0.756	3.285
169.00	2.2	37.3	21.5	0.6350	0.797	3.461
170.00	2.1	37.2	21.3	0.6350	0.797	3.461
171.00	2.0	37.1	21.7	0.6350	0.797	3.460
172.00	2.0	36.8	21.4	0.6350	0.797	3.459
173.00	1.9	36.6	21.0	0.6350	0.797	3.458
174.00	1.9	36.6	21.1	0.6350	0.797	3.458
175.00	1.8	36.6	21.5	0.6350	0.797	3.458
176.00	1.8	36.6	21.4	0.6350	0.797	3.457
177.00	1.8	36.5	21.3	0.6350	0.797	3.457
178.00	1.7	36.2	20.9	0.5715	0.756	3.278
179.00	1.7	36.3	21.1	0.6350	0.797	3.456
180.00	1.7	36.4	21.5	0.5715	0.756	3.279
181.00	1.7	36.3	21.3	0.6350	0.797	3.456
182.00	1.7	36.1	20.9	0.6350	0.797	3.455
183.00	1.6	36.0	20.8	0.6350	0.797	3.454
184.00	1.6	36.1	21.3	0.5715	0.756	3.278
185.00	1.6	36.1	21.5	0.5715	0.756	3.278
186.00	1.5	36.0	21.0	0.5715	0.756	3.277
187.00	1.5	35.8	20.7	0.6350	0.797	3.453
188.00	1.4	36.0	21.5	0.5715	0.756	3.277
189.00	1.4	36.0	21.5	0.6350	0.797	3.454
190.00	1.3	36.0	21.6	0.5715	0.756	3.277
191.00	1.3	35.7	21.0	0.5715	0.756	3.275
192.00	1.2	35.8	21.6	0.5715	0.756	3.276
193.00	1.2	35.8	21.8	0.5715	0.756	3.276
194.00	1.1	35.7	21.3	0.5715	0.756	3.275

2015-01-30 - Caddy B415.1 - Test results - B415.1 spreadsheet - Run #4.xlsDirectoutput

Appendix B Data and Calculation forms (page 86 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	14%	18.5	0.002
Total Output	173414	KJ	(from Psychro.Chart)
Total Input	255292	KJ	
EFFIC.	**67.9%**		

Baro	Duct S.P.
29.83	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
195.00	1.1	35.5	21.0	0.5715	0.756	3.274
196.00	1.0	35.5	21.1	0.5715	0.756	3.274
197.00	1.0	35.6	21.9	0.5715	0.756	3.275
198.00	0.9	35.5	21.4	0.6350	0.797	3.452
199.00	0.9	35.5	22.2	0.5715	0.756	3.274
200.00	0.8	35.2	21.5	0.6350	0.797	3.450
201.00	0.8	35.2	21.3	0.5715	0.756	3.272
202.00	0.9	37.5	21.2	0.6350	0.797	3.462
203.00	0.5	43.1	21.0	0.2540	0.504	2.210
204.00	0.3	38.0	20.8	0.1270	0.356	1.550
205.00	0.4	36.9	21.1	0.6350	0.797	3.459
206.00	0.4	36.5	21.8	0.6350	0.797	3.457
207.00	0.4	36.2	21.9	0.6350	0.797	3.455
208.00	0.4	35.9	21.2	0.5715	0.756	3.277
209.00	0.4	35.5	21.0	0.6350	0.797	3.451
210.00	0.4	35.3	21.3	0.6350	0.797	3.450
211.00	0.4	35.3	21.5	0.6350	0.797	3.450
212.00	0.5	38.1	21.1	0.5715	0.756	3.288
213.00	0.0	43.4	20.7	0.5080	0.713	3.126
214.00	-0.2	38.1	20.4	0.1270	0.356	1.550
215.00	-0.1	37.1	21.4	0.5715	0.756	3.283
216.00	0.0	36.6	21.2	0.5715	0.756	3.280
217.00	0.0	35.9	20.9	0.6350	0.797	3.454
218.00	0.0	35.5	20.9	0.5715	0.756	3.274
219.00	0.0	35.4	21.6	0.5715	0.756	3.274
220.00	0.0	44.1	17.1	0.5715	0.756	3.319

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Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Duct area	Test Categ
	29.84	1.0478		0.99	0.1437	
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
0.00	0.474		2056.3	18.87	38,805	36,805
1.00	0.500		2167.2	19.36	41,966	39,803
2.00	0.500		2168.4	19.84	43,021	40,803
3.00	0.475		2060.3	21.28	43,846	41,586
4.00	0.503		2178.1	22.93	49,949	47,374
5.00	0.504		2183.5	24.08	52,577	49,866
6.00	0.505		2186.9	24.96	54,590	51,776
7.00	0.505		2189.5	26.54	58,118	55,122
8.00	0.506		2193.4	26.63	58,404	55,394
9.00	0.507		2196.1	27.71	60,849	57,713
10.00	0.507		2198.4	28.60	62,876	59,635
11.00	0.508		2200.7	29.74	65,450	62,076
12.00	0.508		2202.3	29.91	65,880	62,484
13.00	0.507		2199.5	28.82	63,396	60,128
14.00	0.621		2692.4	27.90	75,108	71,236
15.00	0.621		2691.8	27.54	74,143	70,321
16.00	0.621		2691.1	27.10	72,939	69,180
17.00	0.621		2691.2	27.77	74,736	70,883
18.00	0.621		2692.0	28.05	75,499	71,607
19.00	0.621		2691.7	27.07	72,855	69,100
20.00	0.642		2780.6	27.55	76,600	72,651
21.00	0.642		2782.3	27.06	75,296	71,415
22.00	0.621		2693.1	27.96	75,293	71,411
23.00	0.621		2693.5	27.97	75,326	71,443
24.00	0.641		2780.2	28.09	78,083	74,058
25.00	0.621		2691.1	26.85	72,260	68,535
26.00	0.621		2691.6	26.83	72,223	68,500
27.00	0.641		2777.8	26.85	74,592	70,747
28.00	0.622		2695.9	28.96	78,078	74,053
29.00	0.508		2202.5	29.55	65,080	61,725
30.00	0.507		2198.3	27.12	59,620	56,546
31.00	0.621		2690.2	26.86	72,268	68,542
32.00	0.620		2687.5	26.12	70,206	66,587
33.00	0.621		2691.0	27.96	75,228	71,351
34.00	0.507		2199.0	28.02	61,620	58,444
35.00	0.507		2199.3	28.53	62,735	59,502
36.00	0.507		2199.0	28.51	62,694	59,462
37.00	0.507		2199.3	28.78	63,289	60,026
38.00	0.507		2198.4	28.76	63,216	59,958

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Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	29.84	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
39.00	0.507		2198.5	28.45	62,544	59,320
40.00	0.481		2085.8	28.43	59,292	56,236
41.00	0.507		2197.8	27.94	61,406	58,240
42.00	0.507		2197.3	27.83	61,148	57,996
43.00	0.507		2196.3	27.82	61,094	57,945
44.00	0.507		2195.9	27.91	61,283	58,124
45.00	0.507		2195.6	27.59	60,572	57,450
46.00	0.506		2194.3	28.00	61,439	58,272
47.00	0.506		2194.1	27.50	60,347	57,236
48.00	0.506		2193.9	26.96	59,147	56,098
49.00	0.506		2193.7	26.81	58,813	55,781
50.00	0.506		2193.5	26.84	58,877	55,842
51.00	0.506		2192.2	26.67	58,466	55,452
52.00	0.506		2192.6	26.60	58,332	55,325
53.00	0.506		2191.4	26.02	57,016	54,077
54.00	0.505		2191.0	26.36	57,748	54,771
55.00	0.505		2189.2	26.37	57,737	54,761
56.00	0.505		2189.4	25.59	56,026	53,138
57.00	0.505		2189.4	25.60	56,056	53,167
58.00	0.505		2188.8	25.35	55,479	52,619
59.00	0.505		2187.4	25.73	56,274	53,374
60.00	0.504		2186.5	25.12	54,916	52,086
61.00	0.505		2187.0	24.44	53,448	50,693
62.00	0.504		2186.5	25.14	54,978	52,144
63.00	0.504		2186.1	24.67	53,935	51,155
64.00	0.504		2185.1	24.50	53,541	50,781
65.00	0.504		2185.4	24.43	53,396	50,643
66.00	0.504		2185.2	24.14	52,743	50,024
67.00	0.504		2184.8	24.04	52,532	49,824
68.00	0.504		2183.4	24.57	53,648	50,882
69.00	0.504		2184.1	24.29	53,062	50,327
70.00	0.504		2183.7	23.96	52,317	49,620
71.00	0.504		2183.7	24.03	52,473	49,768
72.00	0.504		2183.3	24.20	52,829	50,105
73.00	0.503		2182.1	24.29	52,995	50,263
74.00	0.504		2182.7	23.78	51,897	49,221
75.00	0.504		2182.7	23.80	51,941	49,264
76.00	0.504		2182.4	23.37	50,996	48,368
77.00	0.503		2181.4	23.93	52,202	49,511

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Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	29.84	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
78.00	0.503		2181.5	23.51	51,289	48,645
79.00	0.503		2181.7	22.92	50,007	47,429
80.00	0.503		2181.5	23.64	51,564	48,906
81.00	0.503		2180.6	24.06	52,464	49,760
82.00	0.503		2180.9	23.62	51,512	48,857
83.00	0.503		2181.3	23.43	51,113	48,478
84.00	0.503		2181.4	23.00	50,173	47,587
85.00	0.503		2181.4	23.67	51,630	48,968
86.00	0.503		2180.2	23.58	51,409	48,759
87.00	0.503		2180.9	23.11	50,392	47,794
88.00	0.503		2180.6	23.21	50,607	47,998
89.00	0.503		2180.8	23.10	50,381	47,784
90.00	0.503		2179.7	23.40	51,014	48,384
91.00	0.503		2179.6	23.02	50,167	47,581
92.00	0.503		2180.4	22.72	49,538	46,985
93.00	0.503		2180.1	23.03	50,198	47,611
94.00	0.503		2179.4	23.16	50,465	47,864
95.00	0.503		2179.4	23.21	50,585	47,978
96.00	0.503		2180.0	22.32	48,649	46,141
97.00	0.503		2180.4	22.58	49,236	46,698
98.00	0.503		2179.9	22.87	49,860	47,290
99.00	0.503		2179.3	23.15	50,453	47,852
100.00	0.503		2179.6	23.01	50,158	47,572
101.00	0.503		2179.9	22.76	49,625	47,067
102.00	0.503		2179.9	23.04	50,233	47,643
103.00	0.503		2179.1	23.28	50,721	48,107
104.00	0.503		2179.0	22.73	49,524	46,971
105.00	0.503		2179.4	22.56	49,176	46,641
106.00	0.503		2178.9	22.54	49,107	46,576
107.00	0.503		2178.2	22.76	49,582	47,027
108.00	0.502		2177.9	22.72	49,489	46,938
109.00	0.502		2177.7	22.52	49,052	46,524
110.00	0.502		2177.5	22.12	48,175	45,692
111.00	0.502		2177.6	22.07	48,050	45,574
112.00	0.502		2176.4	22.22	48,358	45,865
113.00	0.502		2177.0	21.63	47,082	44,655
114.00	0.502		2176.7	22.09	48,082	45,603
115.00	0.502		2175.8	21.83	47,508	45,059
116.00	0.502		2174.8	22.00	47,849	45,383

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Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	29.84	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
117.00	0.502		2173.9	21.59	46,940	44,521
118.00	0.502		2174.4	21.36	46,444	44,050
119.00	0.502		2173.7	21.16	46,004	43,632
120.00	0.501		2173.1	21.17	46,007	43,635
121.00	0.501		2171.9	21.09	45,809	43,448
122.00	0.501		2172.8	20.04	43,543	41,298
123.00	0.501		2172.5	20.83	45,263	42,930
124.00	0.501		2171.9	20.53	44,599	42,300
125.00	0.501		2170.9	20.61	44,733	42,427
126.00	0.501		2170.6	20.53	44,570	42,273
127.00	0.501		2171.2	20.36	44,198	41,920
128.00	0.501		2171.2	20.32	44,122	41,848
129.00	0.501		2170.7	20.50	44,508	42,213
130.00	0.501		2170.5	20.36	44,183	41,906
131.00	0.501		2170.8	20.03	43,472	41,231
132.00	0.501		2170.5	19.79	42,963	40,748
133.00	0.501		2170.4	19.81	42,997	40,780
134.00	0.500		2169.4	20.37	44,197	41,919
135.00	0.501		2169.4	20.00	43,392	41,155
136.00	0.500		2169.2	20.00	43,381	41,145
137.00	0.500		2168.8	19.94	43,251	41,021
138.00	0.500		2168.1	19.99	43,349	41,115
139.00	0.500		2167.6	19.56	42,403	40,217
140.00	0.500		2167.9	19.03	41,247	39,121
141.00	0.500		2167.1	18.94	41,052	38,935
142.00	0.500		2166.1	19.60	42,465	40,276
143.00	0.500		2165.3	18.83	40,768	38,666
144.00	0.500		2166.2	18.50	40,086	38,020
145.00	0.500		2165.6	18.78	40,672	38,575
146.00	0.474		2054.2	18.86	38,749	36,751
147.00	0.499		2164.7	18.48	40,008	37,945
148.00	0.499		2164.7	18.34	39,705	37,658
149.00	0.499		2164.7	18.68	40,442	38,357
150.00	0.499		2164.2	18.31	39,630	37,587
151.00	0.499		2163.0	18.59	40,216	38,143
152.00	0.499		2163.4	17.73	38,362	36,384
153.00	0.499		2163.5	17.94	38,807	36,807
154.00	0.499		2163.2	18.18	39,331	37,303
155.00	0.473		2051.5	17.75	36,420	34,542

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Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Duct area	Test Categ
	29.84	1.0478		0.99	0.1437	
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
156.00	0.473		2051.3	17.99	36,892	34,990
157.00	0.499		2162.0	17.84	38,568	36,580
158.00	0.499		2161.8	17.62	38,096	36,132
159.00	0.473		2050.5	17.04	34,944	33,143
160.00	0.498		2160.2	17.52	37,842	35,891
161.00	0.498		2160.1	17.40	37,593	35,655
162.00	0.498		2159.7	17.15	37,037	35,128
163.00	0.498		2159.0	17.16	37,057	35,147
164.00	0.498		2158.4	16.65	35,948	34,095
165.00	0.498		2157.7	16.58	35,785	33,940
166.00	0.498		2158.0	16.31	35,190	33,376
167.00	0.498		2157.5	16.20	34,957	33,155
168.00	0.472		2046.3	16.03	32,795	31,104
169.00	0.497		2156.0	15.89	34,267	32,500
170.00	0.497		2155.8	16.10	34,702	32,913
171.00	0.497		2155.5	15.60	33,615	31,883
172.00	0.497		2154.5	15.54	33,488	31,762
173.00	0.497		2153.7	15.77	33,954	32,204
174.00	0.497		2153.7	15.67	33,739	31,999
175.00	0.497		2153.7	15.29	32,922	31,225
176.00	0.497		2153.6	15.30	32,953	31,254
177.00	0.497		2153.3	15.37	33,094	31,388
178.00	0.471		2041.9	15.47	31,594	29,966
179.00	0.497		2152.7	15.33	33,005	31,304
180.00	0.471		2042.5	15.03	30,706	29,123
181.00	0.497		2152.7	15.18	32,676	30,991
182.00	0.496		2151.9	15.31	32,952	31,253
183.00	0.496		2151.6	15.30	32,927	31,230
184.00	0.471		2041.6	14.92	30,451	28,881
185.00	0.471		2041.6	14.83	30,280	28,719
186.00	0.471		2041.1	15.15	30,921	29,327
187.00	0.496		2150.7	15.22	32,743	31,055
188.00	0.471		2041.1	14.57	29,741	28,208
189.00	0.496		2151.5	14.57	31,349	29,733
190.00	0.471		2041.1	14.47	29,536	28,014
191.00	0.471		2040.3	14.89	30,374	28,809
192.00	0.471		2040.5	14.32	29,223	27,717
193.00	0.471		2040.5	14.15	28,882	27,393
194.00	0.471		2040.2	14.53	29,636	28,109

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Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Duct area	Test Categ
	29.84	1.0478		0.99	0.1437	
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
195.00	0.471		2039.7	14.65	29,871	28,331
196.00	0.471		2039.6	14.61	29,792	28,256
197.00	0.471		2039.8	13.79	28,136	26,686
198.00	0.496		2149.9	14.23	30,596	29,018
199.00	0.471		2039.5	13.39	27,318	25,910
200.00	0.496		2148.7	13.81	29,683	28,153
201.00	0.470		2038.4	13.94	28,422	26,956
202.00	0.498		2156.8	16.45	35,482	33,653
203.00	0.318		1376.4	22.36	30,773	29,187
204.00	0.223		965.3	17.29	16,692	15,831
205.00	0.497		2154.6	15.95	34,361	32,589
206.00	0.497		2153.3	14.82	31,905	30,260
207.00	0.497		2152.3	14.50	31,204	29,595
208.00	0.471		2040.9	14.86	30,320	28,757
209.00	0.496		2149.7	14.63	31,444	29,823
210.00	0.496		2149.2	14.14	30,383	28,816
211.00	0.496		2149.1	13.88	29,826	28,289
212.00	0.473		2048.2	17.19	35,208	33,393
213.00	0.449		1947.3	22.88	44,558	42,261
214.00	0.223		965.4	17.83	17,213	16,326
215.00	0.472		2044.9	15.90	32,510	30,835
216.00	0.471		2043.2	15.54	31,748	30,112
217.00	0.496		2151.4	15.15	32,587	30,907
218.00	0.471		2039.6	14.82	30,222	28,664
219.00	0.471		2039.3	13.97	28,495	27,027
220.00	0.477		2067.6	27.20	56,234	53,335

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	ory (1, 2, 3, 4)	4		Target	44730
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
0.00	0	0	0	0	on	1005.2
1.00	673	673	**40,372**	38,291		1059.4
2.00	708	1,381	**41,433**	39,297		1060.0
3.00	725	2,106	**42,113**	39,942		1007.2
4.00	781	2,886	**43,297**	41,065		1064.8
5.00	854	3,741	**44,889**	42,576		1067.4
6.00	893	4,634	**46,338**	43,950		1069.1
7.00	939	5,573	**47,769**	45,307		1070.4
8.00	971	6,544	**49,081**	46,550		1072.3
9.00	994	7,538	**50,252**	47,662		1073.6
10.00	1,031	8,569	**51,413**	48,763		1074.7
11.00	1,069	9,638	**52,572**	49,862		1075.8
12.00	1,094	10,733	**53,663**	50,897		1076.6
13.00	1,077	11,810	**54,507**	51,698		1075.2
14.00	1,156	12,966	**55,569**	52,704		1316.2
15.00	1,244	14,210	**56,839**	53,909		1315.9
16.00	1,226	15,435	**57,883**	54,899		1315.5
17.00	1,231	16,666	**58,822**	55,789		1315.6
18.00	1,252	17,918	**59,727**	56,648		1316.0
19.00	1,236	19,154	**60,487**	57,369		1315.8
20.00	1,245	20,400	**61,199**	58,044		1359.3
21.00	1,266	21,665	**61,901**	58,710		1360.1
22.00	1,255	22,921	**62,511**	59,289		1316.6
23.00	1,255	24,176	**63,067**	59,816		1316.7
24.00	1,278	25,454	**63,635**	60,355		1359.1
25.00	1,252	26,707	**64,096**	60,792		1315.6
26.00	1,204	27,911	**64,409**	61,089		1315.8
27.00	1,223	29,134	**64,742**	61,405		1357.9
28.00	1,273	30,407	**65,158**	61,799		1317.9
29.00	1,194	31,601	**65,382**	62,012		1076.7
30.00	1,039	32,640	**65,281**	61,916		1074.7
31.00	1,100	33,740	**65,303**	61,937		1315.1
32.00	1,187	34,927	**65,488**	62,113		1313.8
33.00	1,212	36,139	**65,708**	62,320		1315.5
34.00	1,141	37,280	**65,788**	62,396		1075.0
35.00	1,036	38,316	**65,685**	62,299		1075.1
36.00	1,045	39,361	**65,602**	62,220		1075.0
37.00	1,050	40,411	**65,531**	62,153		1075.1
38.00	1,054	41,465	**65,471**	62,097		1074.7

2015-01-30 - Caddy B415.1 - Test results - B415.1 spreadsheet - Run #4.xlsDirectoutput

Appendix B Data and Calculation forms (page 94 of 136)

	ory (1, 2, 3, 4)	4		Target	44730
	Air Density @		Rated Capacity	44730	Btu/hr
	STP		Cat 3	29074.5	Btu/hr
Total Output	1.204	kg/m³	Cat 2	23706.9	Btu/hr
Total Input			Cat 1	13419	Btu/hr
EFFIC.					

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
39.00	1,048	42,513	**65,405**	62,033		1074.7
40.00	1,015	43,529	**65,293**	61,927		1019.7
41.00	1,006	44,535	**65,173**	61,813		1074.4
42.00	1,021	45,556	**65,080**	61,725		1074.2
43.00	1,019	46,575	**64,988**	61,638		1073.7
44.00	1,020	47,594	**64,901**	61,556		1073.5
45.00	1,015	48,610	**64,813**	61,472		1073.3
46.00	1,017	49,627	**64,730**	61,394		1072.7
47.00	1,015	50,641	**64,649**	61,316		1072.6
48.00	996	51,637	**64,547**	61,219		1072.5
49.00	983	52,620	**64,433**	61,112		1072.4
50.00	981	53,601	**64,321**	61,006		1072.3
51.00	978	54,579	**64,210**	60,900		1071.7
52.00	973	55,552	**64,099**	60,794		1071.8
53.00	961	56,513	**63,977**	60,680		1071.2
54.00	956	57,470	**63,855**	60,564		1071.1
55.00	962	58,432	**63,744**	60,458		1070.2
56.00	948	59,380	**63,622**	60,342		1070.3
57.00	934	60,314	**63,489**	60,216		1070.3
58.00	929	61,244	**63,356**	60,090		1070.0
59.00	931	62,175	**63,229**	59,969		1069.3
60.00	927	63,102	**63,102**	59,849		1068.9
61.00	903	64,005	**62,955**	59,710		1069.1
62.00	904	64,908	**62,814**	59,576		1068.9
63.00	908	65,816	**62,682**	59,451		1068.7
64.00	896	66,711	**62,542**	59,318		1068.2
65.00	891	67,603	**62,402**	59,186		1068.3
66.00	884	68,487	**62,261**	59,051		1068.2
67.00	877	69,364	**62,117**	58,915		1068.0
68.00	885	70,249	**61,985**	58,789		1067.4
69.00	889	71,138	**61,859**	58,671		1067.7
70.00	878	72,017	**61,728**	58,546		1067.5
71.00	873	72,890	**61,597**	58,422		1067.5
72.00	878	73,767	**61,473**	58,304		1067.3
73.00	882	74,649	**61,355**	58,193		1066.7
74.00	874	75,523	**61,235**	58,078		1067.0
75.00	865	76,389	**61,111**	57,961		1067.0
76.00	858	77,246	**60,984**	57,840		1066.9
77.00	860	78,106	**60,862**	57,725		1066.4

2015-01-30 - Caddy B415.1 - Test results - B415.1 spreadsheet - Run #4.xlsDirectoutput

Appendix B Data and Calculation forms (page 95 of 136)

	ory (1, 2, 3, 4)	4		Target	44730
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
78.00	862	78,969	**60,745**	57,614		1066.4
79.00	844	79,813	**60,617**	57,493		1066.5
80.00	846	80,659	**60,495**	57,376		1066.4
81.00	867	81,526	**60,390**	57,277		1066.0
82.00	866	82,393	**60,287**	57,180		1066.2
83.00	855	83,248	**60,179**	57,077		1066.3
84.00	844	84,092	**60,066**	56,969		1066.4
85.00	848	84,940	**59,958**	56,867		1066.4
86.00	859	85,799	**59,860**	56,774		1065.8
87.00	848	86,647	**59,757**	56,676		1066.2
88.00	842	87,489	**59,652**	56,577		1066.0
89.00	842	88,331	**59,549**	56,479		1066.1
90.00	845	89,175	**59,450**	56,386		1065.6
91.00	843	90,019	**59,353**	56,293		1065.5
92.00	831	90,850	**59,250**	56,195		1065.9
93.00	831	91,681	**59,149**	56,100		1065.8
94.00	839	92,520	**59,055**	56,011		1065.4
95.00	842	93,362	**58,965**	55,926		1065.4
96.00	827	94,189	**58,868**	55,833		1065.7
97.00	816	95,004	**58,766**	55,736		1065.9
98.00	826	95,830	**58,672**	55,647		1065.7
99.00	836	96,666	**58,585**	55,566		1065.4
100.00	838	97,504	**58,503**	55,487		1065.5
101.00	832	98,336	**58,417**	55,406		1065.6
102.00	832	99,168	**58,334**	55,327		1065.7
103.00	841	100,009	**58,258**	55,255		1065.3
104.00	835	100,845	**58,180**	55,181		1065.2
105.00	823	101,667	**58,096**	55,101		1065.4
106.00	819	102,486	**58,011**	55,021		1065.1
107.00	822	103,309	**57,930**	54,944		1064.8
108.00	826	104,134	**57,852**	54,870		1064.7
109.00	821	104,956	**57,774**	54,796		1064.6
110.00	810	105,766	**57,690**	54,717		1064.5
111.00	802	106,568	**57,604**	54,635		1064.5
112.00	803	107,371	**57,520**	54,555		1063.9
113.00	795	108,166	**57,433**	54,473		1064.2
114.00	793	108,959	**57,347**	54,391		1064.1
115.00	797	109,756	**57,264**	54,312		1063.7
116.00	795	110,551	**57,181**	54,234		1063.2

2015-01-30 - Caddy B415.1 - Test results - B415.1 spreadsheet - Run #4.xlsDirectoutput

Appendix B Data and Calculation forms (page 96 of 136)

	ory (1, 2, 3, 4)	4		Target	44730
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
117.00	790	111,341	**57,098**	54,154		1062.7
118.00	778	112,119	**57,010**	54,071		1063.0
119.00	770	112,889	**56,919**	53,985		1062.6
120.00	767	113,656	**56,828**	53,899		1062.3
121.00	765	114,421	**56,738**	53,813		1061.8
122.00	745	115,166	**56,639**	53,719		1062.2
123.00	740	115,906	**56,539**	53,625		1062.0
124.00	749	116,655	**56,446**	53,536		1061.8
125.00	744	117,399	**56,352**	53,447		1061.2
126.00	744	118,143	**56,259**	53,359		1061.1
127.00	740	118,883	**56,165**	53,270		1061.4
128.00	736	119,619	**56,071**	53,181		1061.4
129.00	739	120,357	**55,980**	53,095		1061.1
130.00	739	121,097	**55,891**	53,010		1061.1
131.00	730	121,827	**55,799**	52,922		1061.2
132.00	720	122,547	**55,703**	52,832		1061.1
133.00	716	123,264	**55,608**	52,741		1061.0
134.00	727	123,990	**55,518**	52,656		1060.5
135.00	730	124,720	**55,431**	52,574		1060.5
136.00	723	125,443	**55,343**	52,490		1060.4
137.00	722	126,165	**55,255**	52,407		1060.2
138.00	722	126,887	**55,168**	52,324		1059.9
139.00	715	127,601	**55,080**	52,241		1059.6
140.00	697	128,299	**54,985**	52,151		1059.8
141.00	686	128,984	**54,887**	52,058		1059.4
142.00	696	129,680	**54,795**	51,970		1058.9
143.00	694	130,374	**54,702**	51,883		1058.5
144.00	674	131,048	**54,603**	51,789		1059.0
145.00	673	131,721	**54,505**	51,695		1058.7
146.00	662	132,383	**54,404**	51,599		1004.2
147.00	656	133,039	**54,302**	51,503		1058.2
148.00	664	133,703	**54,204**	51,410		1058.2
149.00	668	134,371	**54,109**	51,320		1058.2
150.00	667	135,039	**54,015**	51,231		1058.0
151.00	665	135,704	**53,922**	51,142		1057.4
152.00	655	136,359	**53,826**	51,051		1057.6
153.00	643	137,002	**53,726**	50,957		1057.6
154.00	651	137,653	**53,631**	50,866		1057.5
155.00	631	138,284	**53,529**	50,770		1002.9

2015-01-30 - Caddy B415.1 - Test results - B415.1 spreadsheet - Run #4.xlsDirectoutput

Appendix B Data and Calculation forms (page 97 of 136)

	ory (1, 2, 3, 4)	4			Target	44730
	Air Density @			Rated Capacity	44730	Btu/hr
	STP			Cat 3	29074.5	Btu/hr
Total Output	1.204	kg/m³		Cat 2	23706.9	Btu/hr
Total Input				Cat 1	13419	Btu/hr
EFFIC.						

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
156.00	611	138,895	**53,421**	50,667		1002.8
157.00	629	139,524	**53,321**	50,573		1056.9
158.00	639	140,163	**53,226**	50,483		1056.8
159.00	608	140,771	**53,121**	50,383		1002.4
160.00	606	141,377	**53,017**	50,284		1056.0
161.00	629	142,006	**52,922**	50,193		1056.0
162.00	622	142,628	**52,825**	50,102		1055.8
163.00	617	143,245	**52,728**	50,010		1055.4
164.00	608	143,854	**52,629**	49,916		1055.1
165.00	598	144,452	**52,528**	49,820		1054.8
166.00	591	145,043	**52,425**	49,723		1055.0
167.00	585	145,628	**52,321**	49,624		1054.7
168.00	565	146,192	**52,211**	49,520		1000.3
169.00	559	146,751	**52,101**	49,415		1054.0
170.00	575	147,326	**51,997**	49,317		1053.9
171.00	569	147,895	**51,893**	49,218		1053.7
172.00	559	148,454	**51,786**	49,117		1053.2
173.00	562	149,016	**51,682**	49,018		1052.9
174.00	564	149,580	**51,579**	48,921		1052.8
175.00	556	150,136	**51,475**	48,822		1052.9
176.00	549	150,685	**51,370**	48,722		1052.8
177.00	550	151,235	**51,266**	48,623		1052.7
178.00	539	151,774	**51,160**	48,523		998.2
179.00	538	152,313	**51,055**	48,423		1052.4
180.00	531	152,844	**50,948**	48,322		998.5
181.00	528	153,372	**50,841**	48,221		1052.3
182.00	547	153,919	**50,742**	48,127		1052.0
183.00	549	154,468	**50,645**	48,034		1051.8
184.00	528	154,996	**50,542**	47,937		998.0
185.00	506	155,502	**50,433**	47,833		998.1
186.00	510	156,012	**50,326**	47,732		997.8
187.00	530	156,542	**50,227**	47,638		1051.4
188.00	520	157,063	**50,126**	47,542		997.8
189.00	509	157,572	**50,023**	47,444		1051.8
190.00	507	158,079	**49,920**	47,346		997.8
191.00	499	158,578	**49,815**	47,247		997.4
192.00	497	159,075	**49,711**	47,148		997.5
193.00	484	159,559	**49,604**	47,047		997.5
194.00	488	160,047	**49,499**	46,947		997.4

2015-01-30 - Caddy B415.1 - Test results - B415.1 spreadsheet - Run #4.xlsDirectoutput

Appendix B Data and Calculation forms (page 98 of 136)

	ory (1, 2, 3, 4)	4		Target	44730
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
195.00	496	160,543	**49,398**	46,851		997.1
196.00	497	161,040	**49,298**	46,757		997.1
197.00	483	161,523	**49,195**	46,659		997.1
198.00	489	162,012	**49,094**	46,564		1051.0
199.00	482	162,494	**48,993**	46,468		997.0
200.00	475	162,969	**48,891**	46,370		1050.4
201.00	484	163,453	**48,792**	46,277		996.5
202.00	531	163,984	**48,708**	46,197		1054.3
203.00	571	164,556	**48,637**	46,130		672.8
204.00	387	164,943	**48,513**	46,012		471.9
205.00	432	165,375	**48,402**	45,907		1053.3
206.00	552	165,927	**48,328**	45,837		1052.6
207.00	526	166,453	**48,247**	45,760		1052.2
208.00	513	166,966	**48,163**	45,680		997.7
209.00	515	167,480	**48,081**	45,602		1050.9
210.00	515	167,996	**47,999**	45,525		1050.6
211.00	502	168,497	**47,914**	45,444		1050.6
212.00	543	169,041	**47,842**	45,376		1001.2
213.00	667	169,708	**47,805**	45,341		951.9
214.00	494	170,202	**47,720**	45,260		472.0
215.00	423	170,625	**47,616**	45,162		999.7
216.00	535	171,160	**47,545**	45,094		998.8
217.00	536	171,697	**47,474**	45,027		1051.7
218.00	523	172,220	**47,400**	44,957		997.1
219.00	489	172,709	**47,318**	44,878		996.9
220.00	705	173,414	**47,295**	44,857		1010.7

2015-01-30 - Caddy B415.1 - Test results - B415.1 spreadsheet - Run #4.xlsDirectoutput

Appendix B Data and Calculation forms (page 99 of 136)

E&E FUEL PRELOAD DATA SHEET

Manufacturer: SBI
Model: Caddy
Run #: 1
Test Date: 1/27/2015

Control# 0
Tech: 0

Test Load Weight:

			Lower	Ideal	Upper
Firebox Volume:	3.25	cu. ft	29.25	32.50	35.75

Load Volume: 0.0000 cu. ft

Loading Density: 10.812 lbs./ft3

Number of Spaces: 0
Spacer weight: 0

Load Density (wet): #DIV/0! lbs./ft3
Dry Wood Density: #DIV/0!

	Red Oak	White Oak
Species	X	

Piece Size: Thick x Wide x Length	Weight lbs	Meter Moisture Content Dry Uncorrected %			Ave. MC x Weight	Volume Cubic Inches
	5.65	27.50	18.30	19.60	123.17	0.00
	6.38	20.00	20.00	21.30	130.3646667	0.00
	5.66	27.80	20.70	27.50	143.3866667	0.00
	7.24	27.30	24.20	23.30	180.5173333	0.00
	5.18	27.30	18.30	26.10	123.802	0.00
	5.03	25.40	19.30	19.00	106.8036667	0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
				SUM MCxWT	808.0443333	16
						18
						20
						22
						24
						26
						28
						30
						32
						34

Test Load Weight: 35.14 lbs.

Dry Weight: 12.72 kg.

Average Moisture Content: %

Dry: 23.00

25.27
Must be 18-28

Wet: 20.17
must be 15-25

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsPreload Data

Appendix B Data and Calculation forms (page 100 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	16%	18.3	0.002
Total Output	151594	KJ	(from Psychro.Chart)
Total Input	247546	KJ	
EFFIC.	**61.2%**		

Baro	Duct S.P.
30	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
0.00	34.0	34.3	16.7	0.0000	0.000	0.000
1.00	34.1	35.4	16.5	0.5080	0.713	3.078
2.00	33.7	43.4	16.4	0.0000	0.000	0.000
3.00	33.2	40.7	16.7	0.0000	0.000	0.000
4.00	33.3	34.9	17.3	0.5080	0.713	3.075
5.00	33.3	33.9	17.2	0.5080	0.713	3.070
6.00	33.3	37.1	17.1	0.5080	0.713	3.086
7.00	32.7	44.0	17.0	0.0000	0.000	0.000
8.00	32.4	36.6	17.1	0.0000	0.000	0.000
9.00	32.2	36.1	17.3	0.5080	0.713	3.081
10.00	32.0	36.4	17.1	0.5080	0.713	3.083
11.00	31.8	36.9	17.3	0.5080	0.713	3.085
12.00	31.4	37.6	17.3	0.5080	0.713	3.088
13.00	31.0	38.6	17.9	0.5080	0.713	3.093
14.00	30.8	38.5	17.9	0.5080	0.713	3.093
15.00	30.7	37.4	18.0	0.5080	0.713	3.088
16.00	30.6	36.2	17.8	0.5080	0.713	3.082
17.00	30.5	35.2	18.0	0.5080	0.713	3.077
18.00	30.4	34.4	18.1	0.5080	0.713	3.073
19.00	30.3	33.7	18.1	0.5080	0.713	3.069
20.00	30.2	33.1	18.3	0.5080	0.713	3.066
21.00	30.1	32.6	18.2	0.5080	0.713	3.064
22.00	29.9	39.1	17.9	0.5080	0.713	3.096
23.00	29.4	42.9	17.7	0.0000	0.000	0.000
24.00	29.3	34.6	17.4	0.5080	0.713	3.074
25.00	29.3	33.2	17.6	0.5080	0.713	3.067
26.00	29.5	33.8	17.5	0.5080	0.713	3.070
27.00	29.1	41.1	17.3	0.0000	0.000	0.000
28.00	28.6	44.1	17.3	0.0000	0.000	0.000
29.00	28.7	34.0	17.7	0.5080	0.713	3.071
30.00	28.7	32.9	17.2	0.5080	0.713	3.065
31.00	28.8	36.4	17.3	0.5080	0.713	3.083
32.00	28.3	42.4	17.1	0.0000	0.000	0.000
33.00	27.9	36.7	17.0	0.0000	0.000	0.000
34.00	28.0	34.2	17.3	0.5080	0.713	3.072
35.00	28.1	33.5	17.3	0.5080	0.713	3.068
36.00	28.0	33.0	17.3	0.5080	0.713	3.066
37.00	27.9	32.7	17.5	0.5080	0.713	3.064
38.00	27.9	32.4	17.4	0.5080	0.713	3.063

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 101 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	16%	18.3	0.002
Total Output	151594	KJ	(from Psychro.Chart)
Total Input	247546	KJ	
EFFIC.	**61.2%**		

Baro	Duct S.P.
30	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
39.00	27.7	32.2	17.2	0.5080	0.713	3.062
40.00	27.6	32.0	17.1	0.5080	0.713	3.061
41.00	27.5	32.0	17.4	0.5080	0.713	3.061
42.00	27.3	31.9	17.3	0.5080	0.713	3.060
43.00	27.2	32.0	16.9	0.5080	0.713	3.061
44.00	27.0	31.8	17.5	0.5080	0.713	3.060
45.00	26.9	31.8	16.9	0.5080	0.713	3.060
46.00	26.7	31.9	17.0	0.5080	0.713	3.060
47.00	26.5	32.0	17.0	0.5080	0.713	3.061
48.00	26.4	32.0	17.1	0.5080	0.713	3.061
49.00	26.2	32.1	17.0	0.5080	0.713	3.061
50.00	26.1	32.1	17.0	0.5080	0.713	3.061
51.00	25.9	32.5	17.6	0.5715	0.756	3.249
52.00	25.8	32.3	17.2	0.5080	0.713	3.062
53.00	25.7	32.1	17.2	0.5080	0.713	3.061
54.00	25.5	31.7	17.1	0.5080	0.713	3.059
55.00	25.4	31.4	17.6	0.5080	0.713	3.058
56.00	25.3	30.9	17.2	0.5080	0.713	3.055
57.00	25.2	35.4	17.1	0.5080	0.713	3.078
58.00	24.6	40.4	17.0	0.0000	0.000	0.000
59.00	24.2	34.9	16.8	0.0000	0.000	0.000
60.00	24.4	33.0	17.2	0.5080	0.713	3.066
61.00	24.4	32.2	17.3	0.5715	0.756	3.248
62.00	24.4	31.6	17.2	0.5080	0.713	3.059
63.00	24.5	34.0	17.2	0.5715	0.756	3.257
64.00	23.8	40.4	17.0	0.0000	0.000	0.000
65.00	23.4	36.0	17.1	0.0000	0.000	0.000
66.00	23.5	34.0	17.7	0.5080	0.713	3.071
67.00	23.5	33.5	17.6	0.5080	0.713	3.068
68.00	23.4	33.3	17.2	0.5715	0.756	3.254
69.00	23.3	33.3	17.1	0.5715	0.756	3.253
70.00	23.1	33.3	17.5	0.5715	0.756	3.253
71.00	22.9	33.5	17.6	0.5715	0.756	3.254
72.00	22.8	33.4	17.2	0.5715	0.756	3.254
73.00	22.6	33.4	17.1	0.5715	0.756	3.254
74.00	22.4	33.3	17.1	0.5715	0.756	3.253
75.00	22.3	33.4	17.1	0.5715	0.756	3.254
76.00	22.1	33.4	17.3	0.5715	0.756	3.254
77.00	21.9	33.4	17.3	0.5715	0.756	3.254

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 102 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	16%	18.3	0.002
Total Output	151594	KJ	(from Psychro.Chart)
Total Input	247546	KJ	
EFFIC.	**61.2%**		

Baro	Duct S.P.
30	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
78.00	21.8	33.2	17.2	0.5715	0.756	3.253
79.00	21.6	33.2	17.5	0.5715	0.756	3.253
80.00	21.5	33.3	17.5	0.5715	0.756	3.253
81.00	21.3	33.2	17.3	0.5715	0.756	3.253
82.00	21.2	33.3	17.5	0.5715	0.756	3.253
83.00	21.0	33.3	17.3	0.5715	0.756	3.253
84.00	20.8	33.3	17.5	0.5715	0.756	3.254
85.00	20.7	33.4	17.4	0.5715	0.756	3.254
86.00	20.5	33.5	17.3	0.5715	0.756	3.254
87.00	20.3	33.5	17.5	0.5715	0.756	3.254
88.00	20.2	33.6	17.3	0.5715	0.756	3.255
89.00	20.0	33.7	17.3	0.5715	0.756	3.255
90.00	19.8	33.8	17.3	0.5715	0.756	3.256
91.00	19.6	33.9	17.6	0.5715	0.756	3.257
92.00	19.5	33.8	17.3	0.5715	0.756	3.256
93.00	19.3	33.9	17.1	0.5715	0.756	3.257
94.00	19.1	33.9	17.2	0.5715	0.756	3.257
95.00	19.0	34.1	17.4	0.5715	0.756	3.257
96.00	18.8	34.1	17.2	0.5715	0.756	3.258
97.00	18.6	34.1	17.1	0.5715	0.756	3.258
98.00	18.5	34.1	17.2	0.5715	0.756	3.258
99.00	18.3	34.2	17.2	0.5715	0.756	3.258
100.00	18.1	34.4	17.4	0.5715	0.756	3.259
101.00	18.0	34.3	17.2	0.5715	0.756	3.259
102.00	17.8	34.4	17.4	0.5715	0.756	3.259
103.00	17.7	34.5	17.6	0.5715	0.756	3.260
104.00	17.5	34.5	17.5	0.5715	0.756	3.260
105.00	17.4	34.6	17.5	0.5715	0.756	3.260
106.00	17.2	34.9	17.9	0.5715	0.756	3.262
107.00	17.1	34.5	17.7	0.5715	0.756	3.260
108.00	17.0	34.4	17.7	0.5715	0.756	3.259
109.00	16.9	34.3	17.4	0.5715	0.756	3.259
110.00	16.7	34.4	17.9	0.5715	0.756	3.259
111.00	16.6	34.1	17.6	0.5715	0.756	3.257
112.00	16.5	33.8	17.5	0.5715	0.756	3.256
113.00	16.4	33.8	18.0	0.5715	0.756	3.256
114.00	16.3	33.7	17.8	0.5715	0.756	3.255
115.00	16.1	33.5	17.7	0.5715	0.756	3.254
116.00	16.0	33.4	17.5	0.5715	0.756	3.254

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 103 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	16%	18.3	0.002
Total Output	151594	KJ	(from Psychro.Chart)
Total Input	247546	KJ	
EFFIC.	**61.2%**		

Baro	Duct S.P.
30	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
117.00	15.9	33.3	17.4	0.5715	0.756	3.253
118.00	15.8	33.2	17.7	0.5715	0.756	3.253
119.00	15.6	33.2	18.0	0.5715	0.756	3.253
120.00	15.5	33.3	18.0	0.5715	0.756	3.253
121.00	15.4	33.2	17.9	0.5715	0.756	3.253
122.00	15.3	33.1	17.7	0.5715	0.756	3.252
123.00	15.2	33.1	18.0	0.5715	0.756	3.252
124.00	15.0	33.0	17.6	0.5715	0.756	3.252
125.00	14.9	33.1	17.6	0.5715	0.756	3.252
126.00	14.8	33.2	17.7	0.5715	0.756	3.253
127.00	14.7	33.1	17.7	0.5715	0.756	3.252
128.00	14.5	33.1	17.6	0.5715	0.756	3.252
129.00	14.4	32.9	17.5	0.5715	0.756	3.251
130.00	14.3	32.7	17.6	0.5715	0.756	3.250
131.00	14.2	32.5	17.6	0.5715	0.756	3.249
132.00	14.0	32.5	17.5	0.5715	0.756	3.249
133.00	13.9	32.4	17.6	0.5715	0.756	3.249
134.00	13.8	32.4	17.6	0.5715	0.756	3.249
135.00	13.7	32.2	17.5	0.5715	0.756	3.248
136.00	13.6	32.4	17.7	0.5715	0.756	3.248
137.00	13.5	32.4	17.6	0.5715	0.756	3.249
138.00	13.4	32.3	17.6	0.5715	0.756	3.248
139.00	13.3	32.2	17.5	0.5715	0.756	3.248
140.00	13.2	32.2	17.6	0.5715	0.756	3.248
141.00	13.0	32.2	17.5	0.5715	0.756	3.248
142.00	12.9	32.3	18.1	0.5715	0.756	3.248
143.00	12.8	32.4	17.9	0.5715	0.756	3.249
144.00	12.7	32.3	17.7	0.5715	0.756	3.248
145.00	12.6	32.3	17.6	0.5715	0.756	3.248
146.00	12.5	32.3	17.7	0.5715	0.756	3.248
147.00	12.4	32.3	17.6	0.5715	0.756	3.248
148.00	12.3	32.2	17.5	0.5715	0.756	3.248
149.00	12.1	32.4	17.7	0.5715	0.756	3.248
150.00	12.0	32.3	17.7	0.5715	0.756	3.248
151.00	11.9	32.3	18.0	0.5715	0.756	3.248
152.00	11.8	32.4	17.7	0.5715	0.756	3.249
153.00	11.7	32.4	17.8	0.5715	0.756	3.249
154.00	11.6	32.4	17.8	0.5715	0.756	3.248
155.00	11.5	32.4	17.6	0.5715	0.756	3.249

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 104 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	16%	18.3	0.002
Total Output	151594	KJ	(from Psychro.Chart)
Total Input	247546	KJ	
EFFIC.	**61.2%**		

Baro	Duct S.P.
30	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
156.00	11.4	32.5	17.7	0.5715	0.756	3.249
157.00	11.3	32.7	17.8	0.5715	0.756	3.250
158.00	11.2	32.6	17.5	0.5715	0.756	3.250
159.00	11.1	32.5	17.5	0.5715	0.756	3.249
160.00	11.0	32.5	17.5	0.5715	0.756	3.249
161.00	10.9	32.4	17.5	0.5715	0.756	3.249
162.00	10.8	32.4	17.6	0.5715	0.756	3.249
163.00	10.7	32.2	17.5	0.5715	0.756	3.248
164.00	10.6	32.2	17.6	0.5715	0.756	3.247
165.00	10.6	32.0	17.4	0.5715	0.756	3.247
166.00	10.5	31.9	17.6	0.5715	0.756	3.246
167.00	10.4	31.8	17.5	0.5715	0.756	3.245
168.00	10.3	31.8	17.8	0.5715	0.756	3.245
169.00	10.3	31.6	17.6	0.5715	0.756	3.244
170.00	10.2	31.5	17.7	0.5715	0.756	3.244
171.00	10.1	31.4	17.7	0.5715	0.756	3.243
172.00	10.0	31.2	17.5	0.5715	0.756	3.242
173.00	10.1	32.4	17.6	0.5715	0.756	3.248
174.00	9.5	39.3	17.4	0.0000	0.000	0.000
175.00	9.0	38.2	17.1	0.0000	0.000	0.000
176.00	9.2	33.6	17.8	0.5715	0.756	3.255
177.00	9.3	33.0	17.6	0.5715	0.756	3.252
178.00	9.4	32.4	17.6	0.5715	0.756	3.249
179.00	9.4	32.1	18.2	0.5715	0.756	3.247
180.00	9.4	31.8	17.8	0.5715	0.756	3.246
181.00	9.5	31.6	17.9	0.5715	0.756	3.244
182.00	9.1	39.0	17.5	0.0000	0.000	0.000
183.00	8.6	42.4	17.3	0.0000	0.000	0.000
184.00	8.7	33.3	17.3	0.0000	0.000	0.000
185.00	8.8	32.2	17.7	0.5715	0.756	3.247
186.00	9.1	35.2	17.5	0.5715	0.756	3.263
187.00	8.6	41.0	17.4	0.0000	0.000	0.000
188.00	8.3	43.6	17.3	0.0000	0.000	0.000
189.00	8.4	32.9	17.3	0.0000	0.000	0.000
190.00	8.8	32.9	17.5	0.5715	0.756	3.251
191.00	8.5	40.6	17.4	0.0000	0.000	0.000
192.00	8.1	43.6	17.2	0.0000	0.000	0.000
193.00	8.2	33.6	17.4	0.0000	0.000	0.000
194.00	8.5	32.0	17.4	0.5715	0.756	3.246

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 105 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	16%	18.3	0.002
Total Output	151594	KJ	(from Psychro.Chart)
Total Input	247546	KJ	
EFFIC.	**61.2%**		

Baro	Duct S.P.
30	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
195.00	8.3	40.0	17.4	0.0000	0.000	0.000
196.00	8.0	43.4	17.3	0.0000	0.000	0.000
197.00	8.0	33.7	17.3	0.0000	0.000	0.000
198.00	8.3	32.2	17.7	0.5715	0.756	3.247
199.00	8.1	40.6	17.4	0.0000	0.000	0.000
200.00	7.8	43.8	17.3	0.0000	0.000	0.000
201.00	7.7	34.0	17.1	0.0000	0.000	0.000
202.00	8.1	32.3	17.3	0.5715	0.756	3.248
203.00	7.9	40.6	17.2	0.1270	0.356	1.552
204.00	7.6	43.7	17.1	0.0000	0.000	0.000
205.00	7.5	34.6	17.1	0.0000	0.000	0.000
206.00	7.9	32.4	17.2	0.5715	0.756	3.249
207.00	7.7	41.1	17.1	0.1270	0.356	1.553
208.00	7.4	44.1	17.1	0.0000	0.000	0.000
209.00	7.4	34.2	17.1	0.0000	0.000	0.000
210.00	7.7	32.5	17.5	0.5715	0.756	3.249
211.00	7.5	41.2	17.2	0.0000	0.000	0.000
212.00	7.2	44.0	17.1	0.0000	0.000	0.000
213.00	7.2	34.4	17.1	0.0000	0.000	0.000
214.00	7.6	32.6	17.3	0.5080	0.713	3.064
215.00	7.3	41.1	17.2	0.2540	0.504	2.196
216.00	7.1	44.0	17.1	0.0000	0.000	0.000
217.00	7.0	34.6	17.2	0.0000	0.000	0.000
218.00	7.3	32.6	17.1	0.5080	0.713	3.064
219.00	7.1	41.2	17.1	0.0000	0.000	0.000
220.00	6.9	44.1	17.1	0.0000	0.000	0.000
221.00	6.7	35.1	16.9	0.0000	0.000	0.000
222.00	7.1	32.9	17.2	0.5080	0.713	3.065
223.00	6.9	41.3	17.0	0.2540	0.504	2.197
224.00	6.7	44.0	17.0	0.0000	0.000	0.000
225.00	6.5	35.0	16.8	0.0000	0.000	0.000
226.00	7.0	32.9	17.2	0.5080	0.713	3.065
227.00	6.8	41.4	17.0	0.0000	0.000	0.000
228.00	6.5	44.1	17.0	0.0000	0.000	0.000
229.00	6.4	34.8	16.9	0.0000	0.000	0.000
230.00	6.8	33.7	17.1	0.5080	0.713	3.069
231.00	6.6	41.8	17.1	0.0000	0.000	0.000
232.00	6.3	44.3	17.0	0.0000	0.000	0.000
233.00	6.2	34.8	17.0	0.0000	0.000	0.000

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 106 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	16%	18.3	0.002
Total Output	151594	KJ	(from Psychro.Chart)
Total Input	247546	KJ	
EFFIC.	**61.2%**		

Baro	Duct S.P.
30	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
234.00	6.6	33.9	17.2	0.5080	0.713	3.070
235.00	6.4	41.8	17.1	0.0000	0.000	0.000
236.00	6.2	44.2	17.0	0.0000	0.000	0.000
237.00	6.0	35.3	17.0	0.0000	0.000	0.000
238.00	6.4	32.6	17.3	0.5080	0.713	3.064
239.00	6.3	41.1	17.2	0.0000	0.000	0.000
240.00	6.0	43.9	17.1	0.0000	0.000	0.000
241.00	5.8	40.1	16.8	0.0000	0.000	0.000
242.00	6.1	32.2	17.2	0.2540	0.504	2.165
243.00	6.2	40.5	17.2	0.5080	0.713	3.103
244.00	6.0	43.7	17.1	0.0000	0.000	0.000
245.00	5.8	45.3	17.0	0.0000	0.000	0.000
246.00	6.0	32.7	17.3	0.0000	0.000	0.000
247.00	6.1	39.9	17.2	0.5080	0.713	3.100
248.00	5.8	44.1	17.2	0.0000	0.000	0.000
249.00	5.7	36.1	17.0	0.0000	0.000	0.000
250.00	6.0	33.6	17.5	0.5080	0.713	3.069
251.00	6.1	32.6	17.4	0.5080	0.713	3.064
252.00	6.1	41.1	17.3	0.5080	0.713	3.106
253.00	5.7	42.3	17.1	0.0000	0.000	0.000
254.00	6.0	34.1	17.5	0.0000	0.000	0.000
255.00	6.1	33.1	17.6	0.5080	0.713	3.066
256.00	6.2	32.4	17.7	0.5080	0.713	3.063
257.00	6.4	35.6	17.5	0.5080	0.713	3.079
258.00	6.0	42.4	17.4	0.0000	0.000	0.000
259.00	5.7	35.0	17.1	0.0000	0.000	0.000
260.00	5.9	33.4	17.4	0.5080	0.713	3.068
261.00	6.0	32.7	17.8	0.5080	0.713	3.064
262.00	6.0	32.1	17.9	0.5080	0.713	3.061
263.00	5.9	39.6	17.4	0.5080	0.713	3.099
264.00	5.5	44.2	17.4	0.0000	0.000	0.000
265.00	5.6	33.9	17.7	0.0000	0.000	0.000
266.00	5.7	32.9	17.5	0.5080	0.713	3.065
267.00	5.8	32.2	17.7	0.5080	0.713	3.062
268.00	5.7	40.1	17.5	0.5080	0.713	3.101
269.00	5.2	44.8	17.3	0.0000	0.000	0.000
270.00	5.4	33.8	17.4	0.5080	0.713	3.070
271.00	5.5	32.9	17.7	0.5080	0.713	3.065
272.00	5.7	32.3	17.8	0.5080	0.713	3.062

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 107 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	16%	18.3	0.002
Total Output	151594	KJ	(from Psychro.Chart)
Total Input	247546	KJ	
EFFIC.	**61.2%**		

Baro	Duct S.P.
30	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
273.00	5.4	40.7	17.5	0.5080	0.713	3.104
274.00	4.9	43.1	17.1	0.0000	0.000	0.000
275.00	5.1	33.7	17.4	0.0000	0.000	0.000
276.00	5.3	32.9	17.9	0.5080	0.713	3.065
277.00	5.5	34.2	17.6	0.5080	0.713	3.072
278.00	5.1	41.6	17.5	0.0000	0.000	0.000
279.00	4.7	36.8	17.3	0.0000	0.000	0.000
280.00	4.9	33.5	17.5	0.5080	0.713	3.068
281.00	5.1	32.7	17.7	0.5080	0.713	3.064
282.00	5.2	36.7	17.6	0.5080	0.713	3.084
283.00	4.8	42.8	17.5	0.0000	0.000	0.000
284.00	4.6	35.1	17.2	0.0000	0.000	0.000
285.00	4.8	33.4	17.5	0.5080	0.713	3.068
286.00	4.9	32.5	17.6	0.5080	0.713	3.063
287.00	4.9	38.3	17.5	0.5080	0.713	3.092
288.00	4.5	43.6	17.3	0.0000	0.000	0.000
289.00	4.4	34.5	17.2	0.0000	0.000	0.000
290.00	4.6	33.2	17.5	0.5080	0.713	3.067
291.00	4.7	32.3	17.5	0.5080	0.713	3.062
292.00	4.6	39.4	17.4	0.5080	0.713	3.098
293.00	4.2	44.0	17.3	0.0000	0.000	0.000
294.00	4.2	34.4	17.2	0.0000	0.000	0.000
295.00	4.3	33.1	17.5	0.5080	0.713	3.066
296.00	4.4	32.3	17.4	0.5080	0.713	3.062
297.00	4.3	40.5	17.5	0.5080	0.713	3.103
298.00	3.9	44.4	17.3	0.0000	0.000	0.000
299.00	4.0	34.0	17.3	0.0000	0.000	0.000
300.00	4.1	33.0	17.7	0.5080	0.713	3.066
301.00	4.4	35.5	17.5	0.5080	0.713	3.078
302.00	4.0	42.1	17.4	0.0000	0.000	0.000
303.00	3.6	37.3	17.1	0.0000	0.000	0.000
304.00	3.8	33.7	17.5	0.5080	0.713	3.069
305.00	3.9	32.6	17.5	0.5080	0.713	3.064
306.00	4.1	37.4	17.5	0.5080	0.713	3.088
307.00	3.7	43.1	17.3	0.0000	0.000	0.000
308.00	3.5	34.7	17.1	0.0000	0.000	0.000
309.00	3.7	33.2	17.7	0.5080	0.713	3.067
310.00	3.8	32.4	17.6	0.5080	0.713	3.063
311.00	3.7	40.8	17.3	0.5080	0.713	3.104

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 108 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	16%	18.3	0.002
Total Output	151594	KJ	(from Psychro.Chart)
Total Input	247546	KJ	
EFFIC.	**61.2%**		

Baro	Duct S.P.
30	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
312.00	3.3	44.4	17.2	0.0000	0.000	0.000
313.00	3.4	33.7	17.2	0.0000	0.000	0.000
314.00	3.6	32.7	17.5	0.5080	0.713	3.064
315.00	3.7	37.9	17.5	0.5080	0.713	3.090
316.00	3.3	43.3	17.3	0.0000	0.000	0.000
317.00	3.1	35.1	17.6	0.0000	0.000	0.000
318.00	3.3	33.3	17.6	0.5080	0.713	3.067
319.00	3.6	34.0	17.6	0.5715	0.756	3.257
320.00	3.2	41.8	17.5	0.0000	0.000	0.000
321.00	2.9	48.2	17.2	0.0000	0.000	0.000
322.00	3.0	33.7	17.3	0.0000	0.000	0.000
323.00	3.2	32.6	17.6	0.5715	0.756	3.250
324.00	3.2	40.2	17.4	0.5715	0.756	3.290
325.00	2.8	44.2	17.3	0.0000	0.000	0.000
326.00	2.8	34.1	17.2	0.0000	0.000	0.000
327.00	3.0	32.8	17.5	0.5715	0.756	3.251
328.00	3.1	38.7	17.4	0.5715	0.756	3.282
329.00	2.7	43.5	17.3	0.0000	0.000	0.000
330.00	2.6	34.9	17.1	0.0000	0.000	0.000
331.00	2.8	33.0	17.4	0.5715	0.756	3.252
332.00	3.0	37.1	17.5	0.5715	0.756	3.273
333.00	2.6	42.8	17.3	0.0000	0.000	0.000
334.00	2.4	36.0	17.1	0.0000	0.000	0.000
335.00	2.6	33.3	17.6	0.5715	0.756	3.253
336.00	2.9	36.0	17.5	0.5715	0.756	3.268
337.00	2.5	42.2	17.3	0.0000	0.000	0.000
338.00	2.2	39.5	17.0	0.0000	0.000	0.000
339.00	2.4	33.3	17.9	0.0000	0.000	0.000
340.00	2.7	36.1	17.4	0.5715	0.756	3.268
341.00	2.4	42.3	17.3	0.0000	0.000	0.000
342.00	2.0	42.7	17.0	0.0000	0.000	0.000
343.00	2.3	33.4	17.7	0.0000	0.000	0.000
344.00	2.6	36.3	17.3	0.5715	0.756	3.269
345.00	2.2	42.6	17.3	0.0000	0.000	0.000
346.00	1.9	40.3	17.0	0.0000	0.000	0.000
347.00	2.2	33.4	17.4	0.0000	0.000	0.000
348.00	2.4	35.9	17.4	0.5715	0.756	3.267
349.00	2.1	42.1	17.2	0.0000	0.000	0.000
350.00	1.8	47.1	17.1	0.0000	0.000	0.000

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 109 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	16%	18.3	0.002
Total Output	151594	KJ	(from Psychro.Chart)
Total Input	247546	KJ	
EFFIC.	**61.2%**		

Baro	Duct S.P.
30	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
351.00	2.0	33.3	17.4	0.0000	0.000	0.000
352.00	2.2	36.6	17.3	0.5715	0.756	3.271
353.00	1.9	42.7	17.3	0.0000	0.000	0.000
354.00	1.6	42.4	16.9	0.0000	0.000	0.000
355.00	1.9	33.2	17.4	0.0000	0.000	0.000
356.00	2.1	37.4	17.5	0.5715	0.756	3.275
357.00	1.8	42.8	17.4	0.0000	0.000	0.000
358.00	1.5	40.2	16.9	0.0000	0.000	0.000
359.00	1.8	33.2	17.4	0.0000	0.000	0.000
360.00	2.0	38.0	17.4	0.5715	0.756	3.278
361.00	1.7	43.1	17.3	0.0000	0.000	0.000
362.00	1.5	36.2	17.0	0.0000	0.000	0.000
363.00	1.7	33.0	17.2	0.5715	0.756	3.252
364.00	1.8	38.3	17.3	0.5715	0.756	3.280
365.00	1.5	43.1	17.2	0.0000	0.000	0.000
366.00	1.3	35.8	17.1	0.0000	0.000	0.000
367.00	1.6	32.9	17.5	0.5715	0.756	3.251
368.00	1.7	38.5	17.2	0.5715	0.756	3.281
369.00	1.4	43.0	17.1	0.0000	0.000	0.000
370.00	1.2	35.6	17.1	0.0000	0.000	0.000
371.00	1.5	32.8	17.7	0.5080	0.713	3.065
372.00	1.5	39.5	17.2	0.5715	0.756	3.286
373.00	1.2	43.5	17.1	0.0000	0.000	0.000
374.00	1.1	34.7	17.1	0.0000	0.000	0.000
375.00	1.4	32.6	17.4	0.5080	0.713	3.064
376.00	1.4	40.1	17.3	0.5080	0.713	3.101
377.00	1.1	43.6	17.2	0.0000	0.000	0.000
378.00	1.1	34.6	16.9	0.0000	0.000	0.000
379.00	1.3	32.6	17.3	0.5080	0.713	3.064
380.00	1.3	40.5	17.2	0.5080	0.713	3.103
381.00	1.0	43.8	17.1	0.0000	0.000	0.000
382.00	1.0	34.1	17.2	0.0000	0.000	0.000
383.00	1.4	33.8	17.2	0.5080	0.713	3.070
384.00	1.1	41.6	17.3	0.5080	0.713	3.109
385.00	0.8	44.2	17.1	0.0000	0.000	0.000
386.00	0.9	33.5	17.0	0.0000	0.000	0.000
387.00	1.2	35.3	17.3	0.5080	0.713	3.077
388.00	1.0	41.9	17.2	0.0000	0.000	0.000
389.00	0.7	44.3	17.1	0.0000	0.000	0.000

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 110 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	16%	18.3	0.002
Total Output	151594	KJ	(from Psychro.Chart)
Total Input	247546	KJ	
EFFIC.	**61.2%**		

Baro	Duct S.P.
30	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
390.00	0.8	33.3	17.1	0.0000	0.000	0.000
391.00	1.1	36.5	17.1	0.5080	0.713	3.083
392.00	0.8	42.3	17.1	0.0000	0.000	0.000
393.00	0.6	45.6	16.9	0.0000	0.000	0.000
394.00	0.7	33.1	17.7	0.0000	0.000	0.000
395.00	1.0	37.7	17.2	0.5080	0.713	3.089
396.00	0.7	42.6	17.1	0.0000	0.000	0.000
397.00	0.4	39.2	16.9	0.0000	0.000	0.000
398.00	0.7	32.7	17.4	0.0000	0.000	0.000
399.00	0.8	38.5	17.2	0.5080	0.713	3.093
400.00	0.6	42.9	17.1	0.0000	0.000	0.000
401.00	0.4	36.8	16.9	0.0000	0.000	0.000
402.00	0.6	32.6	17.0	0.0000	0.000	0.000
403.00	0.7	39.5	17.1	0.5080	0.713	3.098
404.00	0.4	43.1	17.0	0.0000	0.000	0.000
405.00	0.3	35.3	16.9	0.0000	0.000	0.000
406.00	0.5	32.3	17.1	0.5080	0.713	3.062
407.00	0.5	40.4	17.2	0.5080	0.713	3.102
408.00	0.3	43.4	17.1	0.0000	0.000	0.000
409.00	0.2	34.4	16.9	0.0000	0.000	0.000
410.00	0.6	33.0	17.2	0.5080	0.713	3.066
411.00	0.4	41.0	17.1	0.5080	0.713	3.105
412.00	0.2	43.6	17.0	0.0000	0.000	0.000
413.00	0.2	33.7	17.0	0.0000	0.000	0.000
414.00	0.5	35.5	17.2	0.5080	0.713	3.078
415.00	0.3	41.7	17.1	0.0000	0.000	0.000
416.00	0.0	43.9	17.0	0.0000	0.000	0.000
417.00	0.1	33.6	17.2	0.0000	0.000	0.000
418.00	0.4	36.1	17.3	0.5080	0.713	3.081
419.00	0.2	41.9	17.1	0.0000	0.000	0.000
420.00	-0.1	43.9	17.0	0.0000	0.000	0.000
421.00	0.0	33.3	17.1	0.0000	0.000	0.000
422.00	0.3	36.6	17.2	0.5080	0.713	3.084
423.00	0.1	42.0	17.1	0.0000	0.000	0.000
424.00	-0.2	44.1	17.0	0.0000	0.000	0.000
425.00	0.0	33.2	17.3	0.0000	0.000	0.000
426.00	0.2	37.7	17.2	0.5080	0.713	3.089
427.00	-0.1	42.4	17.1	0.0000	0.000	0.000
428.00	-0.3	44.3	17.1	0.0000	0.000	0.000

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 111 of 136)

	Humidity	Temp. C	kg H_2O/kg air
	16%	18.3	0.002
Total Output	151594	KJ	(from Psychro.Chart)
Total Input	247546	KJ	
EFFIC.	**61.2%**		

Baro	Duct S.P.
30	0.20
in Hg	in H_2O

Time	lbs Load Wt.	C Outlet T	C Return T	mm H2O Duct Vel. P.	SQRT Vel. P.	Flow Rate m/sec
429.00	-0.1	33.0	17.2	0.0000	0.000	0.000
430.00	0.1	35.0	17.2	0.0000	0.000	0.000

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 112 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Duct area	Test Categ
	30.01	1.0478		0.99	0.1437	
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
0.00	0.000		1.9	17.71	33	32
1.00	0.442		1917.2	19.10	36,617	34,730
2.00	0.000		1.9	27.32	52	49
3.00	0.000		1.9	24.25	46	43
4.00	0.442		1915.5	17.74	33,990	32,238
5.00	0.441		1912.5	16.83	32,193	30,534
6.00	0.444		1922.4	20.23	38,897	36,892
7.00	0.000		1.9	27.32	52	49
8.00	0.000		1.9	19.77	37	35
9.00	0.443		1919.3	18.97	36,411	34,534
10.00	0.443		1920.1	19.42	37,284	35,362
11.00	0.443		1921.8	19.85	38,144	36,178
12.00	0.444		1923.8	20.41	39,267	37,243
13.00	0.445		1926.9	20.85	40,182	38,111
14.00	0.445		1926.7	20.79	40,054	37,990
15.00	0.444		1923.2	19.59	37,675	35,733
16.00	0.443		1919.6	18.55	35,612	33,777
17.00	0.442		1916.4	17.40	33,350	31,631
18.00	0.442		1914.1	16.49	31,568	29,941
19.00	0.441		1911.7	15.67	29,953	28,409
20.00	0.441		1909.9	14.90	28,460	26,993
21.00	0.440		1908.4	14.48	27,634	26,209
22.00	0.445		1928.5	21.39	41,250	39,124
23.00	0.000		1.9	25.49	48	46
24.00	0.442		1914.7	17.35	33,220	31,507
25.00	0.441		1910.4	15.75	30,094	28,542
26.00	0.441		1912.1	16.45	31,462	29,840
27.00	0.000		1.9	23.99	45	43
28.00	0.000		1.9	27.08	51	48
29.00	0.441		1912.9	16.51	31,574	29,946
30.00	0.441		1909.4	15.84	30,241	28,682
31.00	0.443		1920.1	19.21	36,894	34,992
32.00	0.000		1.9	25.52	48	46
33.00	0.000		1.9	19.90	38	36
34.00	0.441		1913.4	17.12	32,766	31,077
35.00	0.441		1911.2	16.34	31,234	29,624
36.00	0.441		1909.7	15.89	30,350	28,786
37.00	0.440		1908.6	15.37	29,343	27,830
38.00	0.440		1907.8	15.17	28,934	27,442

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 113 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	30.01	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
39.00	0.440		1907.1	15.16	28,907	27,417
40.00	0.440		1906.5	15.07	28,741	27,259
41.00	0.440		1906.6	14.76	28,139	26,688
42.00	0.440		1906.2	14.77	28,161	26,709
43.00	0.440		1906.4	15.21	28,993	27,499
44.00	0.440		1906.0	14.44	27,520	26,101
45.00	0.440		1906.0	15.04	28,663	27,186
46.00	0.440		1906.1	14.97	28,534	27,063
47.00	0.440		1906.5	15.13	28,847	27,360
48.00	0.440		1906.6	15.09	28,762	27,279
49.00	0.440		1906.7	15.23	29,035	27,538
50.00	0.440		1907.0	15.32	29,219	27,712
51.00	0.467		2023.7	15.02	30,389	28,822
52.00	0.440		1907.6	15.31	29,207	27,702
53.00	0.440		1906.9	15.06	28,713	27,232
54.00	0.440		1905.6	14.79	28,177	26,724
55.00	0.439		1904.6	13.96	26,581	25,211
56.00	0.439		1903.2	13.83	26,323	24,966
57.00	0.442		1917.0	18.42	35,314	33,494
58.00	0.000		1.9	23.61	45	42
59.00	0.000		1.9	18.28	34	33
60.00	0.441		1909.5	15.93	30,412	28,844
61.00	0.467		2023.0	15.04	30,428	28,860
62.00	0.440		1905.3	14.56	27,736	26,307
63.00	0.468		2028.8	16.99	34,465	32,689
64.00	0.000		1.9	23.57	44	42
65.00	0.000		1.9	19.09	36	34
66.00	0.441		1912.8	16.51	31,572	29,945
67.00	0.441		1911.2	16.07	30,706	29,124
68.00	0.468		2026.6	16.29	33,015	31,314
69.00	0.468		2026.4	16.35	33,123	31,416
70.00	0.468		2026.5	15.98	32,374	30,705
71.00	0.468		2027.0	16.05	32,543	30,865
72.00	0.468		2026.9	16.34	33,114	31,407
73.00	0.468		2026.8	16.48	33,410	31,688
74.00	0.468		2026.5	16.38	33,202	31,491
75.00	0.468		2026.7	16.38	33,198	31,487
76.00	0.468		2026.8	16.22	32,874	31,180
77.00	0.468		2026.8	16.23	32,891	31,195

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Appendix B Data and Calculation forms (page 114 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Duct area	Test Categ
	30.01	1.0478		0.99	0.1437	
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
78.00	0.467		2026.1	16.17	32,770	31,081
79.00	0.467		2026.2	15.89	32,200	30,540
80.00	0.468		2026.4	15.90	32,214	30,553
81.00	0.467		2026.1	15.98	32,381	30,712
82.00	0.468		2026.5	15.98	32,382	30,713
83.00	0.468		2026.6	16.18	32,794	31,104
84.00	0.468		2026.6	16.02	32,469	30,796
85.00	0.468		2026.7	16.09	32,608	30,927
86.00	0.468		2027.0	16.29	33,014	31,312
87.00	0.468		2027.2	16.14	32,718	31,032
88.00	0.468		2027.4	16.44	33,329	31,611
89.00	0.468		2027.8	16.61	33,685	31,949
90.00	0.468		2028.0	16.60	33,672	31,936
91.00	0.468		2028.6	16.46	33,381	31,660
92.00	0.468		2028.2	16.71	33,883	32,136
93.00	0.468		2028.6	16.95	34,382	32,610
94.00	0.468		2028.6	16.89	34,271	32,504
95.00	0.468		2029.0	16.85	34,183	32,421
96.00	0.468		2029.1	17.03	34,546	32,765
97.00	0.468		2029.1	17.16	34,824	33,029
98.00	0.468		2029.1	17.08	34,658	32,871
99.00	0.468		2029.5	17.20	34,914	33,114
100.00	0.468		2030.0	17.17	34,859	33,062
101.00	0.468		2029.8	17.29	35,098	33,289
102.00	0.468		2030.0	17.14	34,789	32,995
103.00	0.468		2030.5	17.11	34,734	32,944
104.00	0.468		2030.5	17.22	34,956	33,154
105.00	0.469		2030.9	17.32	35,170	33,357
106.00	0.469		2031.6	17.10	34,744	32,953
107.00	0.468		2030.5	17.01	34,546	32,765
108.00	0.468		2030.0	16.85	34,202	32,439
109.00	0.468		2029.8	17.06	34,626	32,841
110.00	0.468		2030.0	16.63	33,756	32,016
111.00	0.468		2029.0	16.63	33,742	32,003
112.00	0.468		2028.1	16.43	33,322	31,605
113.00	0.468		2028.0	15.88	32,211	30,551
114.00	0.468		2027.8	16.04	32,516	30,840
115.00	0.468		2027.1	15.92	32,272	30,608
116.00	0.468		2026.9	16.09	32,603	30,923

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Appendix B Data and Calculation forms (page 115 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	30.01	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
117.00	0.468		2026.4	16.03	32,490	30,815
118.00	0.467		2026.2	15.66	31,724	30,088
119.00	0.467		2026.1	15.34	31,085	29,483
120.00	0.468		2026.4	15.38	31,171	29,564
121.00	0.467		2026.0	15.44	31,275	29,663
122.00	0.467		2025.7	15.53	31,453	29,831
123.00	0.467		2025.8	15.25	30,899	29,306
124.00	0.467		2025.4	15.54	31,483	29,860
125.00	0.467		2025.7	15.64	31,679	30,046
126.00	0.467		2026.1	15.60	31,605	29,976
127.00	0.467		2025.8	15.56	31,528	29,903
128.00	0.467		2025.6	15.56	31,518	29,894
129.00	0.467		2025.1	15.54	31,472	29,850
130.00	0.467		2024.5	15.26	30,902	29,309
131.00	0.467		2023.9	15.11	30,589	29,012
132.00	0.467		2023.9	15.11	30,588	29,011
133.00	0.467		2023.6	14.97	30,294	28,733
134.00	0.467		2023.6	15.03	30,423	28,855
135.00	0.467		2022.9	14.89	30,117	28,564
136.00	0.467		2023.4	14.81	29,965	28,421
137.00	0.467		2023.5	14.97	30,292	28,731
138.00	0.467		2023.2	14.85	30,048	28,499
139.00	0.467		2023.0	14.90	30,134	28,581
140.00	0.467		2023.0	14.82	29,974	28,429
141.00	0.467		2022.9	14.87	30,071	28,521
142.00	0.467		2023.2	14.39	29,115	27,614
143.00	0.467		2023.5	14.60	29,544	28,021
144.00	0.467		2023.3	14.80	29,937	28,394
145.00	0.467		2023.1	14.84	30,025	28,478
146.00	0.467		2023.0	14.73	29,800	28,264
147.00	0.467		2023.3	14.83	30,008	28,461
148.00	0.467		2022.9	14.82	29,976	28,431
149.00	0.467		2023.4	14.86	30,069	28,519
150.00	0.467		2023.1	14.76	29,853	28,315
151.00	0.467		2023.2	14.49	29,313	27,802
152.00	0.467		2023.5	14.82	29,997	28,451
153.00	0.467		2023.5	14.70	29,751	28,217
154.00	0.467		2023.4	14.71	29,766	28,231
155.00	0.467		2023.6	14.94	30,235	28,676

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 116 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	30.01	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
156.00	0.467		2023.9	14.98	30,323	28,760
157.00	0.467		2024.4	15.02	30,398	28,831
158.00	0.467		2024.2	15.22	30,810	29,222
159.00	0.467		2023.9	15.18	30,719	29,135
160.00	0.467		2023.9	15.14	30,643	29,064
161.00	0.467		2023.5	15.03	30,410	28,843
162.00	0.467		2023.7	14.97	30,294	28,733
163.00	0.467		2023.0	14.92	30,185	28,629
164.00	0.467		2022.7	14.76	29,858	28,319
165.00	0.467		2022.3	14.76	29,847	28,308
166.00	0.466		2021.7	14.45	29,224	27,718
167.00	0.466		2021.5	14.40	29,104	27,603
168.00	0.466		2021.4	14.06	28,421	26,956
169.00	0.466		2020.9	14.18	28,661	27,184
170.00	0.466		2020.4	13.92	28,132	26,682
171.00	0.466		2020.1	13.81	27,898	26,460
172.00	0.466		2019.6	13.88	28,036	26,591
173.00	0.467		2023.4	14.89	30,124	28,571
174.00	0.000		1.9	22.13	42	40
175.00	0.000		1.9	21.29	40	38
176.00	0.468		2027.6	16.00	32,452	30,779
177.00	0.467		2025.4	15.52	31,441	29,820
178.00	0.467		2023.5	14.95	30,250	28,691
179.00	0.467		2022.6	14.05	28,428	26,963
180.00	0.466		2021.6	14.19	28,695	27,216
181.00	0.466		2020.7	13.80	27,889	26,451
182.00	0.000		1.9	21.66	41	39
183.00	0.000		1.9	25.26	48	45
184.00	0.000		1.9	16.08	30	29
185.00	0.467		2022.8	14.67	29,670	28,140
186.00	0.469		2032.6	17.78	36,134	34,271
187.00	0.000		1.9	23.82	45	43
188.00	0.000		1.9	26.61	50	48
189.00	0.000		1.9	15.74	30	28
190.00	0.467		2025.0	15.48	31,337	29,722
191.00	0.000		1.9	23.38	44	42
192.00	0.000		1.9	26.62	50	48
193.00	0.000		1.9	16.31	31	29
194.00	0.467		2022.0	14.65	29,617	28,091

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Appendix B Data and Calculation forms (page 117 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	30.01	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
195.00	0.000		1.9	22.90	43	41
196.00	0.000		1.9	26.42	50	47
197.00	0.000		1.9	16.57	31	30
198.00	0.467		2022.8	14.63	29,600	28,074
199.00	0.000		1.9	23.37	44	42
200.00	0.000		1.9	26.68	50	48
201.00	0.000		1.9	17.06	32	31
202.00	0.467		2023.1	15.14	30,631	29,052
203.00	0.223		966.6	23.70	22,905	21,724
204.00	0.000		1.9	26.86	51	48
205.00	0.000		1.9	17.68	33	32
206.00	0.467		2023.6	15.39	31,137	29,532
207.00	0.223		967.4	24.24	23,448	22,239
208.00	0.000		1.9	27.27	51	49
209.00	0.000		1.9	17.28	33	31
210.00	0.467		2023.9	15.16	30,689	29,107
211.00	0.000		1.9	24.17	46	43
212.00	0.000		1.9	27.10	51	48
213.00	0.000		1.9	17.48	33	31
214.00	0.440		1908.5	15.43	29,455	27,937
215.00	0.316		1368.0	24.06	32,907	31,211
216.00	0.000		1.9	27.14	51	49
217.00	0.000		1.9	17.56	33	31
218.00	0.440		1908.4	15.63	29,819	28,282
219.00	0.000		1.9	24.26	46	43
220.00	0.000		1.9	27.20	51	49
221.00	0.000		1.9	18.33	35	33
222.00	0.441		1909.3	15.89	30,330	28,767
223.00	0.316		1368.5	24.48	33,499	31,772
224.00	0.000		1.9	27.31	52	49
225.00	0.000		1.9	18.34	35	33
226.00	0.441		1909.5	15.90	30,367	28,802
227.00	0.000		1.9	24.59	46	44
228.00	0.000		1.9	27.33	52	49
229.00	0.000		1.9	18.01	34	32
230.00	0.441		1911.7	16.69	31,909	30,264
231.00	0.000		1.9	24.96	47	45
232.00	0.000		1.9	27.58	52	49
233.00	0.000		1.9	18.01	34	32

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Appendix B Data and Calculation forms (page 118 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Duct area	Test Categ
	30.01	1.0478		0.99	0.1437	
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
234.00	0.441		1912.5	16.87	32,265	30,602
235.00	0.000		1.9	24.91	47	45
236.00	0.000		1.9	27.45	52	49
237.00	0.000		1.9	18.41	35	33
238.00	0.440		1908.4	15.40	29,387	27,872
239.00	0.000		1.9	24.14	46	43
240.00	0.000		1.9	27.02	51	48
241.00	0.000		1.9	23.53	44	42
242.00	0.311		1348.6	15.21	20,516	19,458
243.00	0.446		1932.8	23.49	45,401	43,061
244.00	0.000		1.9	26.79	51	48
245.00	0.000		1.9	28.60	54	51
246.00	0.000		1.9	15.56	29	28
247.00	0.445		1930.9	22.89	44,193	41,915
248.00	0.000		1.9	27.21	51	49
249.00	0.000		1.9	19.27	36	34
250.00	0.441		1911.5	16.29	31,144	29,539
251.00	0.440		1908.3	15.34	29,282	27,773
252.00	0.446		1934.9	24.12	46,661	44,255
253.00	0.000		1.9	25.47	48	46
254.00	0.000		1.9	16.85	32	30
255.00	0.441		1909.9	15.68	29,939	28,396
256.00	0.440		1907.8	14.84	28,310	26,850
257.00	0.442		1917.8	18.26	35,013	33,208
258.00	0.000		1.9	25.28	48	45
259.00	0.000		1.9	18.05	34	32
260.00	0.441		1911.0	16.17	30,892	29,299
261.00	0.440		1908.6	14.98	28,592	27,118
262.00	0.440		1906.8	14.38	27,411	25,998
263.00	0.445		1930.2	22.40	43,245	41,015
264.00	0.000		1.9	27.12	51	49
265.00	0.000		1.9	16.43	31	29
266.00	0.441		1909.3	15.60	29,778	28,243
267.00	0.440		1907.2	14.65	27,936	26,495
268.00	0.446		1931.7	22.87	44,170	41,893
269.00	0.000		1.9	27.70	52	50
270.00	0.441		1912.2	16.60	31,752	30,115
271.00	0.440		1909.3	15.35	29,300	27,790
272.00	0.440		1907.6	14.67	27,992	26,549

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Appendix B Data and Calculation forms (page 119 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Duct area	Test Categ
	30.01	1.0478		0.99	0.1437	
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
273.00	0.446		1933.5	23.44	45,323	42,987
274.00	0.000		1.9	26.28	50	47
275.00	0.000		1.9	16.46	31	29
276.00	0.440		1909.2	15.14	28,913	27,423
277.00	0.441		1913.5	16.82	32,187	30,528
278.00	0.000		1.9	24.37	46	44
279.00	0.000		1.9	19.65	37	35
280.00	0.441		1911.3	16.22	31,008	29,410
281.00	0.440		1908.6	15.11	28,842	27,356
282.00	0.443		1921.3	19.36	37,195	35,278
283.00	0.000		1.9	25.64	48	46
284.00	0.000		1.9	18.02	34	32
285.00	0.441		1910.8	16.02	30,606	29,028
286.00	0.440		1908.1	15.04	28,696	27,217
287.00	0.444		1926.0	21.03	40,497	38,410
288.00	0.000		1.9	26.46	50	47
289.00	0.000		1.9	17.49	33	31
290.00	0.441		1910.3	15.82	30,212	28,655
291.00	0.440		1907.6	15.03	28,671	27,193
292.00	0.445		1929.5	22.19	42,813	40,606
293.00	0.000		1.9	26.96	51	48
294.00	0.000		1.9	17.41	33	31
295.00	0.441		1910.0	15.75	30,090	28,539
296.00	0.440		1907.4	14.99	28,597	27,123
297.00	0.446		1933.0	23.29	45,014	42,694
298.00	0.000		1.9	27.33	52	49
299.00	0.000		1.9	16.84	32	30
300.00	0.441		1909.5	15.44	29,478	27,959
301.00	0.442		1917.4	18.20	34,900	33,101
302.00	0.000		1.9	25.01	47	45
303.00	0.000		1.9	20.37	38	36
304.00	0.441		1911.7	16.29	31,146	29,540
305.00	0.440		1908.4	15.29	29,172	27,668
306.00	0.444		1923.5	20.16	38,773	36,774
307.00	0.000		1.9	26.06	49	47
308.00	0.000		1.9	17.83	34	32
309.00	0.441		1910.4	15.70	29,984	28,438
310.00	0.440		1907.7	14.95	28,522	27,051
311.00	0.446		1933.7	23.69	45,811	43,450

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Appendix B Data and Calculation forms (page 120 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	30.01	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
312.00	0.000		1.9	27.50	52	49
313.00	0.000		1.9	16.71	32	30
314.00	0.440		1908.6	15.33	29,265	27,756
315.00	0.444		1924.8	20.60	39,657	37,613
316.00	0.000		1.9	26.21	49	47
317.00	0.000		1.9	17.64	33	32
318.00	0.441		1910.5	15.84	30,261	28,701
319.00	0.468		2028.9	16.54	33,563	31,833
320.00	0.000		1.9	24.48	46	44
321.00	0.000		1.9	31.35	59	56
322.00	0.000		1.9	16.59	31	30
323.00	0.467		2024.1	15.08	30,528	28,954
324.00	0.473		2049.3	23.05	47,237	44,802
325.00	0.000		1.9	27.19	51	49
326.00	0.000		1.9	17.12	32	31
327.00	0.467		2024.8	15.43	31,239	29,629
328.00	0.472		2044.2	21.46	43,878	41,617
329.00	0.000		1.9	26.47	50	47
330.00	0.000		1.9	17.89	34	32
331.00	0.467		2025.4	15.70	31,789	30,150
332.00	0.470		2038.8	19.79	40,351	38,271
333.00	0.000		1.9	25.77	49	46
334.00	0.000		1.9	19.02	36	34
335.00	0.468		2026.3	15.79	31,994	30,345
336.00	0.470		2035.5	18.69	38,046	36,084
337.00	0.000		1.9	25.09	47	45
338.00	0.000		1.9	22.73	43	41
339.00	0.000		1.9	15.64	30	28
340.00	0.470		2035.7	18.88	38,438	36,457
341.00	0.000		1.9	25.26	48	45
342.00	0.000		1.9	25.98	49	46
343.00	0.000		1.9	15.79	30	28
344.00	0.470		2036.5	19.21	39,118	37,101
345.00	0.000		1.9	25.54	48	46
346.00	0.000		1.9	23.48	44	42
347.00	0.000		1.9	16.16	30	29
348.00	0.470		2035.1	18.75	38,155	36,188
349.00	0.000		1.9	25.16	47	45
350.00	0.000		1.9	30.30	57	54

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Appendix B Data and Calculation forms (page 121 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Duct area	Test Categ
	30.01	1.0478		0.99	0.1437	
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
351.00	0.000		1.9	16.11	30	29
352.00	0.470		2037.4	19.51	39,746	37,697
353.00	0.000		1.9	25.64	48	46
354.00	0.000		1.9	25.81	49	46
355.00	0.000		1.9	15.96	30	29
356.00	0.471		2040.0	20.13	41,067	38,950
357.00	0.000		1.9	25.65	48	46
358.00	0.000		1.9	23.46	44	42
359.00	0.000		1.9	15.95	30	29
360.00	0.471		2041.8	20.77	42,413	40,226
361.00	0.000		1.9	26.10	49	47
362.00	0.000		1.9	19.37	37	35
363.00	0.467		2025.4	15.88	32,170	30,512
364.00	0.471		2043.1	21.23	43,370	41,135
365.00	0.000		1.9	26.16	49	47
366.00	0.000		1.9	18.89	36	34
367.00	0.467		2025.1	15.57	31,525	29,900
368.00	0.471		2043.4	21.49	43,904	41,641
369.00	0.000		1.9	26.13	49	47
370.00	0.000		1.9	18.69	35	33
371.00	0.440		1909.0	15.21	29,035	27,539
372.00	0.472		2047.0	22.52	46,107	43,730
373.00	0.000		1.9	26.65	50	48
374.00	0.000		1.9	17.81	34	32
375.00	0.440		1908.4	15.39	29,376	27,862
376.00	0.446		1931.6	23.00	44,432	42,142
377.00	0.000		1.9	26.69	50	48
378.00	0.000		1.9	17.93	34	32
379.00	0.440		1908.4	15.47	29,532	28,009
380.00	0.446		1933.0	23.56	45,546	43,198
381.00	0.000		1.9	27.00	51	48
382.00	0.000		1.9	17.02	32	30
383.00	0.441		1912.1	16.73	31,989	30,340
384.00	0.447		1936.3	24.59	47,619	45,164
385.00	0.000		1.9	27.34	52	49
386.00	0.000		1.9	16.66	31	30
387.00	0.442		1916.9	18.17	34,838	33,042
388.00	0.000		1.9	25.01	47	45
389.00	0.000		1.9	27.55	52	49

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Appendix B Data and Calculation forms (page 122 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Duct area	Test Categ
	30.01	1.0478		0.99	0.1437	
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
390.00	0.000		1.9	16.37	31	29
391.00	0.443		1920.7	19.59	37,632	35,692
392.00	0.000		1.9	25.49	48	46
393.00	0.000		1.9	28.88	54	52
394.00	0.000		1.9	15.57	29	28
395.00	0.444		1924.3	20.74	39,909	37,851
396.00	0.000		1.9	25.73	49	46
397.00	0.000		1.9	22.54	43	40
398.00	0.000		1.9	15.47	29	28
399.00	0.445		1926.6	21.50	41,427	39,291
400.00	0.000		1.9	26.04	49	47
401.00	0.000		1.9	20.08	38	36
402.00	0.000		1.9	15.72	30	28
403.00	0.445		1929.8	22.62	43,651	41,401
404.00	0.000		1.9	26.33	50	47
405.00	0.000		1.9	18.63	35	33
406.00	0.440		1907.4	15.35	29,284	27,775
407.00	0.446		1932.4	23.41	45,235	42,903
408.00	0.000		1.9	26.59	50	48
409.00	0.000		1.9	17.70	33	32
410.00	0.441		1909.8	16.03	30,612	29,034
411.00	0.446		1934.3	24.07	46,568	44,167
412.00	0.000		1.9	26.77	51	48
413.00	0.000		1.9	16.90	32	30
414.00	0.442		1917.4	18.41	35,301	33,481
415.00	0.000		1.9	24.85	47	44
416.00	0.000		1.9	27.13	51	49
417.00	0.000		1.9	16.48	31	29
418.00	0.443		1919.4	19.03	36,521	34,638
419.00	0.000		1.9	25.05	47	45
420.00	0.000		1.9	27.18	51	49
421.00	0.000		1.9	16.36	31	29
422.00	0.443		1920.9	19.60	37,650	35,709
423.00	0.000		1.9	25.17	47	45
424.00	0.000		1.9	27.34	52	49
425.00	0.000		1.9	16.08	30	29
426.00	0.444		1924.3	20.70	39,824	37,771
427.00	0.000		1.9	25.50	48	46
428.00	0.000		1.9	27.46	52	49

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Appendix B Data and Calculation forms (page 123 of 136)

Use "X" to Select Duct Traverse Type

	Duct Abs.P	Pitot Traverse Factor		Pitot F.	Test Categ	Duct area
	30.01	1.0478		0.99		0.1437
Total Output	in Hg	9 Point				
Total Input		16 Point	X			
EFFIC.		Round				

Time	Volumetric Flow M^3/sec	EMPTY	Mass Flow kg/hr	Enthalpy Change kJ/kg	Heat Rel. Rate KJ/hr	Heat Rel. Rate Btu/hr
429.00	0.000		1.9	15.95	30	29
430.00	0.000		1.9	17.97	34	32

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 124 of 136)

	ory (1, 2, 3, 4)	2		Target	23706.9
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
0.00	0	0	0	0	on	0.9
1.00	294	294	**17,662**	16,751		937.2
2.00	371	666	**19,967**	18,938		0.9
3.00	1	666	**13,328**	12,641		0.9
4.00	336	1,002	**15,029**	14,254		936.4
5.00	552	1,553	**18,641**	17,680		934.9
6.00	592	2,146	**21,457**	20,351		939.8
7.00	381	2,527	**21,660**	20,543		0.9
8.00	1	2,528	**18,958**	17,981		0.9
9.00	310	2,838	**18,919**	17,944		938.2
10.00	614	3,452	**20,712**	19,644		938.7
11.00	629	4,080	**22,257**	21,110		939.5
12.00	645	4,726	**23,628**	22,410		940.5
13.00	662	5,388	**24,866**	23,584		942.0
14.00	669	6,056	**25,956**	24,618	off	941.9
15.00	648	6,704	**26,816**	25,434		940.2
16.00	611	7,315	**27,430**	26,016		938.4
17.00	575	7,889	**27,845**	26,410		936.9
18.00	541	8,430	**28,101**	26,653		935.7
19.00	513	8,943	**28,241**	26,785		934.5
20.00	487	9,430	**28,289**	26,831		933.7
21.00	467	9,897	**28,278**	26,820		932.9
22.00	573	10,471	**28,556**	27,084		942.8
23.00	377	10,848	**28,299**	26,840		0.9
24.00	342	11,190	**27,975**	26,533		936.0
25.00	528	11,717	**28,122**	26,672		933.9
26.00	513	12,230	**28,224**	26,769		934.7
27.00	323	12,553	**27,895**	26,457		0.9
28.00	1	12,554	**26,901**	25,514		0.9
29.00	348	12,901	**26,693**	25,317		935.1
30.00	515	13,417	**26,833**	25,450		933.4
31.00	559	13,976	**27,050**	25,656		938.6
32.00	358	14,334	**26,877**	25,491		0.9
33.00	1	14,335	**26,063**	24,720		0.9
34.00	295	14,630	**25,818**	24,487		935.4
35.00	533	15,164	**25,995**	24,655		934.3
36.00	513	15,677	**26,128**	24,781		933.5
37.00	497	16,174	**26,229**	24,877		933.0
38.00	486	16,660	**26,305**	24,949		932.6

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Appendix B Data and Calculation forms (page 125 of 136)

	ory (1, 2, 3, 4)	2		Target	23706.9
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
39.00	482	17,142	**26,372**	25,013		932.3
40.00	480	17,622	**26,434**	25,071		932.0
41.00	474	18,096	**26,482**	25,117		932.0
42.00	469	18,566	**26,522**	25,155		931.8
43.00	476	19,042	**26,570**	25,200		932.0
44.00	471	19,513	**26,608**	25,237		931.7
45.00	468	19,981	**26,641**	25,268		931.7
46.00	477	20,458	**26,684**	25,308		931.8
47.00	478	20,936	**26,726**	25,349		932.0
48.00	480	21,416	**26,770**	25,390		932.0
49.00	482	21,897	**26,813**	25,431		932.1
50.00	485	22,383	**26,859**	25,475		932.2
51.00	497	22,880	**26,917**	25,530		989.3
52.00	497	23,377	**26,973**	25,583		932.5
53.00	483	23,859	**27,010**	25,618		932.2
54.00	474	24,333	**27,037**	25,643		931.6
55.00	456	24,790	**27,043**	25,649		931.1
56.00	441	25,230	**27,033**	25,639		930.4
57.00	513	25,744	**27,099**	25,702		937.1
58.00	336	26,080	**26,979**	25,589		0.9
59.00	1	26,081	**26,523**	25,155		0.9
60.00	272	26,353	**26,353**	24,995		933.5
61.00	507	26,860	**26,420**	25,058		988.9
62.00	484	27,345	**26,463**	25,099		931.4
63.00	517	27,862	**26,535**	25,167		991.8
64.00	343	28,205	**26,442**	25,079		0.9
65.00	1	28,206	**26,036**	24,694		0.9
66.00	284	28,490	**25,900**	24,565		935.1
67.00	519	29,009	**25,978**	24,639		934.3
68.00	531	29,540	**26,064**	24,721		990.7
69.00	551	30,091	**26,166**	24,817		990.6
70.00	546	30,637	**26,260**	24,906		990.7
71.00	541	31,178	**26,347**	24,989		990.9
72.00	547	31,725	**26,437**	25,075		990.8
73.00	554	32,279	**26,531**	25,163		990.8
74.00	555	32,834	**26,622**	25,250		990.7
75.00	553	33,388	**26,710**	25,333		990.7
76.00	551	33,938	**26,793**	25,412		990.8
77.00	548	34,486	**26,872**	25,487		990.8

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Appendix B Data and Calculation forms (page 126 of 136)

	ory (1, 2, 3, 4)	2		Target	23706.9
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
78.00	547	35,033	**26,949**	25,560		990.4
79.00	541	35,575	**27,019**	25,626		990.5
80.00	537	36,112	**27,084**	25,688		990.6
81.00	538	36,650	**27,148**	25,749		990.4
82.00	540	37,190	**27,212**	25,809		990.7
83.00	543	37,733	**27,277**	25,871		990.7
84.00	544	38,277	**27,340**	25,931		990.7
85.00	542	38,819	**27,402**	25,989		990.7
86.00	547	39,366	**27,464**	26,049		990.9
87.00	548	39,914	**27,527**	26,108		991.0
88.00	550	40,464	**27,589**	26,167		991.1
89.00	558	41,022	**27,656**	26,230		991.3
90.00	561	41,584	**27,722**	26,293		991.4
91.00	559	42,142	**27,786**	26,354		991.7
92.00	561	42,703	**27,850**	26,414		991.5
93.00	569	43,272	**27,917**	26,478		991.7
94.00	572	43,844	**27,986**	26,543		991.7
95.00	570	44,414	**28,051**	26,605		991.9
96.00	573	44,987	**28,117**	26,668		991.9
97.00	578	45,565	**28,185**	26,732		991.9
98.00	579	46,144	**28,252**	26,795		992.0
99.00	580	46,724	**28,318**	26,858		992.1
100.00	581	47,305	**28,383**	26,920		992.4
101.00	583	47,888	**28,449**	26,982		992.3
102.00	582	48,471	**28,512**	27,043		992.4
103.00	579	49,050	**28,573**	27,100		992.6
104.00	581	49,631	**28,633**	27,157		992.6
105.00	584	50,215	**28,694**	27,215		992.8
106.00	583	50,798	**28,754**	27,271		993.2
107.00	577	51,375	**28,809**	27,324		992.6
108.00	573	51,948	**28,860**	27,372		992.4
109.00	574	52,522	**28,911**	27,421		992.3
110.00	570	53,092	**28,959**	27,466		992.4
111.00	562	53,654	**29,002**	27,507		991.9
112.00	559	54,213	**29,043**	27,546		991.4
113.00	546	54,759	**29,076**	27,577		991.4
114.00	539	55,299	**29,105**	27,604		991.3
115.00	540	55,838	**29,133**	27,631		990.9
116.00	541	56,379	**29,162**	27,658		990.8

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Appendix B Data and Calculation forms (page 127 of 136)

	ory (1, 2, 3, 4)	2		Target	23706.9
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
117.00	542	56,922	**29,191**	27,686		990.6
118.00	535	57,457	**29,215**	27,709		990.5
119.00	523	57,980	**29,234**	27,727		990.5
120.00	519	58,499	**29,249**	27,742		990.6
121.00	520	59,019	**29,266**	27,757		990.4
122.00	523	59,542	**29,283**	27,773		990.2
123.00	520	60,062	**29,298**	27,788		990.3
124.00	520	60,581	**29,314**	27,803		990.1
125.00	526	61,108	**29,332**	27,820		990.3
126.00	527	61,635	**29,350**	27,837		990.4
127.00	526	62,161	**29,368**	27,854		990.3
128.00	525	62,687	**29,384**	27,870		990.2
129.00	525	63,212	**29,401**	27,885		990.0
130.00	520	63,731	**29,414**	27,898		989.7
131.00	512	64,244	**29,425**	27,908		989.4
132.00	510	64,754	**29,433**	27,916		989.4
133.00	507	65,261	**29,441**	27,923		989.3
134.00	506	65,767	**29,448**	27,930		989.3
135.00	504	66,271	**29,454**	27,936		988.9
136.00	501	66,772	**29,458**	27,940		989.1
137.00	502	67,274	**29,463**	27,944		989.2
138.00	503	67,777	**29,468**	27,949		989.0
139.00	502	68,279	**29,473**	27,954		988.9
140.00	501	68,780	**29,477**	27,957		988.9
141.00	500	69,280	**29,481**	27,961		988.9
142.00	493	69,773	**29,482**	27,962		989.0
143.00	489	70,262	**29,481**	27,961		989.2
144.00	496	70,758	**29,482**	27,963		989.1
145.00	500	71,257	**29,486**	27,966		989.0
146.00	499	71,756	**29,489**	27,969		989.0
147.00	498	72,254	**29,492**	27,971		989.1
148.00	500	72,754	**29,495**	27,974		988.9
149.00	500	73,254	**29,498**	27,978		989.1
150.00	499	73,754	**29,502**	27,981		989.0
151.00	493	74,247	**29,502**	27,981		989.1
152.00	494	74,741	**29,503**	27,982		989.2
153.00	498	75,239	**29,505**	27,985		989.2
154.00	496	75,735	**29,507**	27,986		989.2
155.00	500	76,235	**29,510**	27,989		989.3

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Appendix B Data and Calculation forms (page 128 of 136)

	ory (1, 2, 3, 4)	2		Target	23706.9
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
156.00	505	76,740	**29,515**	27,994		989.4
157.00	506	77,246	**29,521**	27,999		989.6
158.00	510	77,756	**29,527**	28,005		989.5
159.00	513	78,268	**29,535**	28,013		989.4
160.00	511	78,780	**29,542**	28,020		989.4
161.00	509	79,289	**29,549**	28,025		989.2
162.00	506	79,794	**29,554**	28,030		989.3
163.00	504	80,298	**29,558**	28,034		988.9
164.00	500	80,799	**29,561**	28,037		988.8
165.00	498	81,296	**29,562**	28,038		988.6
166.00	492	81,789	**29,562**	28,038		988.3
167.00	486	82,275	**29,560**	28,036		988.2
168.00	479	82,754	**29,555**	28,032		988.1
169.00	476	83,230	**29,549**	28,026		987.9
170.00	473	83,703	**29,542**	28,019		987.7
171.00	467	84,170	**29,533**	28,011		987.5
172.00	466	84,636	**29,524**	28,002		987.3
173.00	485	85,121	**29,522**	28,000		989.1
174.00	312	85,433	**29,460**	27,941		0.9
175.00	1	85,434	**29,292**	27,782		0.9
176.00	315	85,749	**29,233**	27,726		991.2
177.00	532	86,282	**29,248**	27,740		990.1
178.00	514	86,796	**29,257**	27,749		989.2
179.00	489	87,285	**29,257**	27,749		988.8
180.00	476	87,761	**29,254**	27,746		988.3
181.00	472	88,232	**29,248**	27,741		987.8
182.00	299	88,531	**29,186**	27,682		0.9
183.00	1	88,532	**29,027**	27,531		0.9
184.00	1	88,533	**28,869**	27,381		0.9
185.00	259	88,792	**28,797**	27,313		988.8
186.00	548	89,340	**28,819**	27,334		993.6
187.00	353	89,693	**28,778**	27,295		0.9
188.00	1	89,694	**28,626**	27,150		0.9
189.00	1	89,694	**28,474**	27,007		0.9
190.00	264	89,958	**28,408**	26,943		989.9
191.00	328	90,286	**28,362**	26,900		0.9
192.00	1	90,287	**28,215**	26,760		0.9
193.00	1	90,287	**28,069**	26,622		0.9
194.00	261	90,548	**28,005**	26,561		988.5

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Appendix B Data and Calculation forms (page 129 of 136)

	ory (1, 2, 3, 4)	2		Target	23706.9
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
195.00	317	90,865	**27,958**	26,517		0.9
196.00	1	90,866	**27,816**	26,382		0.9
197.00	1	90,866	**27,675**	26,248		0.9
198.00	263	91,130	**27,615**	26,192		988.9
199.00	321	91,450	**27,573**	26,152		0.9
200.00	1	91,451	**27,435**	26,021		0.9
201.00	1	91,452	**27,299**	25,892		0.9
202.00	272	91,724	**27,245**	25,840		989.0
203.00	484	92,207	**27,253**	25,849		472.5
204.00	204	92,411	**27,180**	25,779		0.9
205.00	1	92,412	**27,047**	25,653		0.9
206.00	279	92,691	**26,997**	25,606		989.2
207.00	494	93,185	**27,010**	25,618		472.9
208.00	208	93,393	**26,940**	25,552		0.9
209.00	1	93,394	**26,812**	25,429		0.9
210.00	274	93,668	**26,762**	25,383		989.4
211.00	332	94,000	**26,730**	25,352		0.9
212.00	1	94,000	**26,604**	25,232		0.9
213.00	1	94,001	**26,479**	25,114		0.9
214.00	262	94,263	**26,429**	25,067		933.0
215.00	539	94,802	**26,456**	25,093		668.8
216.00	292	95,094	**26,415**	25,053		0.9
217.00	1	95,095	**26,294**	24,938		0.9
218.00	264	95,359	**26,246**	24,893		932.9
219.00	317	95,677	**26,213**	24,862		0.9
220.00	1	95,678	**26,094**	24,749		0.9
221.00	1	95,678	**25,976**	24,637		0.9
222.00	272	95,951	**25,933**	24,596		933.4
223.00	551	96,502	**25,965**	24,626		669.0
224.00	296	96,798	**25,928**	24,591		0.9
225.00	1	96,798	**25,813**	24,482		0.9
226.00	273	97,071	**25,771**	24,443		933.4
227.00	323	97,394	**25,743**	24,416		0.9
228.00	1	97,395	**25,630**	24,309		0.9
229.00	1	97,395	**25,518**	24,203		0.9
230.00	277	97,672	**25,480**	24,166		934.6
231.00	332	98,004	**25,456**	24,143		0.9
232.00	1	98,005	**25,346**	24,040		0.9
233.00	1	98,006	**25,237**	23,937		0.9

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Appendix B Data and Calculation forms (page 130 of 136)

	ory (1, 2, 3, 4)	2		Target	23706.9
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
234.00	278	98,284	**25,201**	23,902		934.9
235.00	333	98,617	**25,179**	23,881		0.9
236.00	1	98,618	**25,072**	23,780		0.9
237.00	1	98,619	**24,967**	23,680	on	0.9
238.00	269	98,888	**24,930**	23,645		932.9
239.00	315	99,202	**24,904**	23,621		0.9
240.00	1	99,203	**24,801**	23,522		0.9
241.00	1	99,204	**24,698**	23,425		0.9
242.00	218	99,422	**24,650**	23,379		659.3
243.00	529	99,951	**24,679**	23,407		944.9
244.00	405	100,357	**24,678**	23,406		0.9
245.00	1	100,357	**24,577**	23,310		0.9
246.00	1	100,358	**24,478**	23,216		0.9
247.00	310	100,668	**24,454**	23,193		943.9
248.00	403	101,071	**24,453**	23,192		0.9
249.00	1	101,072	**24,355**	23,099		0.9
250.00	284	101,355	**24,325**	23,071		934.4
251.00	504	101,859	**24,349**	23,094		932.9
252.00	632	102,491	**24,403**	23,145		945.9
253.00	400	102,891	**24,401**	23,143		0.9
254.00	1	102,892	**24,305**	23,052		0.9
255.00	259	103,151	**24,271**	23,020		933.7
256.00	485	103,636	**24,290**	23,038		932.6
257.00	528	104,164	**24,318**	23,065		937.5
258.00	348	104,512	**24,305**	23,052		0.9
259.00	1	104,513	**24,211**	22,963		0.9
260.00	273	104,785	**24,181**	22,935		934.2
261.00	496	105,281	**24,203**	22,955		933.0
262.00	467	105,748	**24,217**	22,969		932.2
263.00	588	106,336	**24,259**	23,009		943.6
264.00	399	106,734	**24,258**	23,007		0.9
265.00	1	106,735	**24,166**	22,921		0.9
266.00	255	106,990	**24,133**	22,889		933.4
267.00	481	107,471	**24,151**	22,906		932.3
268.00	600	108,071	**24,195**	22,948		944.3
269.00	407	108,479	**24,196**	22,949		0.9
270.00	353	108,832	**24,185**	22,938		934.8
271.00	509	109,341	**24,208**	22,960		933.3
272.00	477	109,818	**24,225**	22,976		932.5

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	ory (1, 2, 3, 4)	2		Target	23706.9
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
273.00	610	110,428	**24,270**	23,019		945.2
274.00	401	110,829	**24,269**	23,018		0.9
275.00	1	110,830	**24,181**	22,935		0.9
276.00	252	111,081	**24,148**	22,903		933.3
277.00	509	111,591	**24,171**	22,925		935.4
278.00	329	111,919	**24,155**	22,910		0.9
279.00	1	111,920	**24,069**	22,828		0.9
280.00	286	112,206	**24,044**	22,805		934.3
281.00	499	112,705	**24,065**	22,825		933.0
282.00	550	113,255	**24,097**	22,855		939.2
283.00	361	113,615	**24,088**	22,846		0.9
284.00	1	113,616	**24,003**	22,766		0.9
285.00	271	113,887	**23,976**	22,740		934.1
286.00	494	114,381	**23,996**	22,759		932.8
287.00	576	114,958	**24,033**	22,794		941.5
288.00	381	115,339	**24,029**	22,790		0.9
289.00	1	115,340	**23,946**	22,712		0.9
290.00	265	115,605	**23,918**	22,685		933.8
291.00	491	116,096	**23,937**	22,703		932.5
292.00	595	116,691	**23,978**	22,742		943.2
293.00	396	117,086	**23,977**	22,741		0.9
294.00	1	117,087	**23,895**	22,664		0.9
295.00	264	117,351	**23,868**	22,638		933.7
296.00	489	117,840	**23,887**	22,655		932.5
297.00	613	118,453	**23,930**	22,696		945.0
298.00	408	118,861	**23,932**	22,698		0.9
299.00	1	118,862	**23,852**	22,622		0.9
300.00	257	119,119	**23,824**	22,596		933.5
301.00	536	119,655	**23,852**	22,622		937.3
302.00	346	120,001	**23,841**	22,612		0.9
303.00	1	120,001	**23,763**	22,538		0.9
304.00	292	120,294	**23,742**	22,518		934.6
305.00	503	120,796	**23,763**	22,538		932.9
306.00	566	121,362	**23,797**	22,570		940.3
307.00	371	121,733	**23,791**	22,565		0.9
308.00	1	121,734	**23,714**	22,492		0.9
309.00	267	122,001	**23,689**	22,468		933.9
310.00	488	122,488	**23,707**	22,485		932.6
311.00	618	123,107	**23,751**	22,526		945.3

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	ory (1, 2, 3, 4)	2		Target	23706.9
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
312.00	413	123,520	**23,754**	22,529		0.9
313.00	1	123,520	**23,678**	22,457		0.9
314.00	255	123,776	**23,651**	22,432		933.0
315.00	574	124,350	**23,686**	22,465		940.9
316.00	376	124,725	**23,682**	22,461		0.9
317.00	1	124,726	**23,607**	22,391		0.9
318.00	267	124,993	**23,584**	22,368		934.0
319.00	532	125,524	**23,610**	22,393		991.8
320.00	347	125,871	**23,601**	22,384		0.9
321.00	1	125,872	**23,528**	22,315		0.9
322.00	1	125,873	**23,455**	22,246		0.9
323.00	267	126,140	**23,432**	22,224		989.5
324.00	647	126,788	**23,479**	22,269		1001.8
325.00	429	127,217	**23,486**	22,276		0.9
326.00	1	127,218	**23,414**	22,207		0.9
327.00	275	127,493	**23,393**	22,187		989.8
328.00	625	128,118	**23,436**	22,228		999.3
329.00	409	128,527	**23,440**	22,231		0.9
330.00	1	128,527	**23,369**	22,164		0.9
331.00	284	128,811	**23,349**	22,146		990.1
332.00	601	129,412	**23,388**	22,182		996.7
333.00	387	129,800	**23,387**	22,182		0.9
334.00	1	129,800	**23,317**	22,115		0.9
335.00	294	130,094	**23,300**	22,099		990.6
336.00	584	130,678	**23,335**	22,132		995.0
337.00	372	131,050	**23,332**	22,130		0.9
338.00	1	131,050	**23,263**	22,064		0.9
339.00	1	131,051	**23,195**	21,999		0.9
340.00	293	131,344	**23,178**	21,984		995.2
341.00	375	131,719	**23,176**	21,982		0.9
342.00	1	131,720	**23,109**	21,917		0.9
343.00	1	131,720	**23,041**	21,854		0.9
344.00	297	132,018	**23,026**	21,839		995.5
345.00	380	132,398	**23,026**	21,839		0.9
346.00	1	132,398	**22,959**	21,776		0.9
347.00	1	132,399	**22,893**	21,713		0.9
348.00	296	132,695	**22,879**	21,699		994.9
349.00	373	133,068	**22,877**	21,698		0.9
350.00	1	133,069	**22,812**	21,636		0.9

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	ory (1, 2, 3, 4)	2		Target	23706.9
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
351.00	1	133,070	**22,747**	21,574		0.9
352.00	303	133,372	**22,734**	21,562		996.0
353.00	384	133,756	**22,735**	21,563		0.9
354.00	1	133,757	**22,671**	21,502		0.9
355.00	1	133,757	**22,607**	21,442		0.9
356.00	307	134,064	**22,595**	21,430		997.3
357.00	390	134,454	**22,597**	21,432		0.9
358.00	1	134,455	**22,534**	21,373		0.9
359.00	1	134,455	**22,472**	21,313		0.9
360.00	313	134,768	**22,461**	21,303		998.1
361.00	399	135,167	**22,465**	21,307		0.9
362.00	1	135,168	**22,404**	21,249		0.9
363.00	298	135,466	**22,391**	21,237		990.1
364.00	629	136,095	**22,433**	21,277		998.8
365.00	404	136,499	**22,438**	21,281		0.9
366.00	1	136,499	**22,377**	21,223		0.9
367.00	291	136,790	**22,364**	21,211		990.0
368.00	628	137,418	**22,405**	21,250		998.9
369.00	406	137,824	**22,410**	21,255		0.9
370.00	1	137,825	**22,350**	21,198		0.9
371.00	270	138,095	**22,333**	21,182		933.2
372.00	622	138,717	**22,374**	21,220		1000.7
373.00	420	139,137	**22,381**	21,228		0.9
374.00	1	139,137	**22,321**	21,171		0.9
375.00	264	139,402	**22,304**	21,154		932.9
376.00	614	140,016	**22,343**	21,191		944.2
377.00	400	140,416	**22,347**	21,195		0.9
378.00	1	140,417	**22,288**	21,139		0.9
379.00	266	140,683	**22,272**	21,124		932.9
380.00	625	141,308	**22,312**	21,162		944.9
381.00	408	141,715	**22,317**	21,167		0.9
382.00	1	141,716	**22,259**	21,112		0.9
383.00	269	141,985	**22,243**	21,096		934.7
384.00	663	142,648	**22,289**	21,140		946.6
385.00	419	143,067	**22,296**	21,147		0.9
386.00	1	143,068	**22,239**	21,092		0.9
387.00	278	143,346	**22,224**	21,079		937.1
388.00	345	143,691	**22,220**	21,075		0.9
389.00	1	143,692	**22,163**	21,021		0.9

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	ory (1, 2, 3, 4)	2		Target	23706.9
	Air Density @ STP		Rated Capacity	44730	Btu/hr
Total Output	1.204	kg/m³	Cat 3	29074.5	Btu/hr
Total Input			Cat 2	23706.9	Btu/hr
EFFIC.			Cat 1	13419	Btu/hr

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
390.00	1	143,693	**22,107**	20,967		0.9
391.00	288	143,981	**22,094**	20,955		938.9
392.00	361	144,342	**22,093**	20,954		0.9
393.00	1	144,343	**22,037**	20,901		0.9
394.00	1	144,344	**21,981**	20,848		0.9
395.00	291	144,635	**21,970**	20,837		940.7
396.00	373	145,008	**21,971**	20,838		0.9
397.00	1	145,009	**21,916**	20,786		0.9
398.00	1	145,009	**21,861**	20,734		0.9
399.00	297	145,307	**21,851**	20,724		941.8
400.00	382	145,689	**21,853**	20,727		0.9
401.00	1	145,689	**21,799**	20,675		0.9
402.00	1	145,690	**21,745**	20,624		0.9
403.00	309	145,998	**21,737**	20,616		943.4
404.00	394	146,392	**21,741**	20,621		0.9
405.00	1	146,393	**21,688**	20,570		0.9
406.00	270	146,663	**21,674**	20,557		932.5
407.00	620	147,284	**21,713**	20,593		944.7
408.00	403	147,687	**21,719**	20,599		0.9
409.00	1	147,687	**21,666**	20,549		0.9
410.00	269	147,956	**21,652**	20,536		933.6
411.00	642	148,598	**21,693**	20,575		945.6
412.00	410	149,009	**21,700**	20,582		0.9
413.00	1	149,009	**21,648**	20,532		0.9
414.00	282	149,292	**21,636**	20,521		937.3
415.00	346	149,638	**21,634**	20,519		0.9
416.00	1	149,638	**21,582**	20,470		0.9
417.00	1	149,639	**21,531**	20,421		0.9
418.00	284	149,923	**21,520**	20,411		938.3
419.00	353	150,276	**21,519**	20,410		0.9
420.00	1	150,277	**21,468**	20,361		0.9
421.00	1	150,278	**21,417**	20,313		0.9
422.00	288	150,566	**21,407**	20,304		939.0
423.00	359	150,924	**21,408**	20,304		0.9
424.00	1	150,925	**21,357**	20,256		0.9
425.00	1	150,926	**21,307**	20,209		0.9
426.00	295	151,221	**21,299**	20,201		940.7
427.00	371	151,592	**21,301**	20,203		0.9
428.00	1	151,593	**21,251**	20,156		0.9

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 135 of 136)

	ory (1, 2, 3, 4)	2		Target	23706.9
	Air Density @		Rated Capacity	44730	Btu/hr
	STP		Cat 3	29074.5	Btu/hr
Total Output	1.204	kg/m³	Cat 2	23706.9	Btu/hr
Total Input			Cat 1	13419	Btu/hr
EFFIC.					

Time	Heat Out for Inter. KJ	Cumm. Heat Out KJ	Average Heat Out KJ/hr	Average Heat Out Btu/hr	Unit on or off	SCFM
429.00	1	151,593	**21,202**	20,109		0.9
430.00	1	151,594	**21,153**	20,062		0.9

2015-02-02 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #5.xlsDirectoutput

Appendix B Data and Calculation forms (page 136 of 136)

E&E FUEL PRELOAD DATA SHEET

Manufacturer: SBI
Model: Caddy
Run #: 1
Test Date: 1/27/2015

Control# 0
Tech: 0

Test Load Weight:

			Lower	Ideal	Upper	
Firebox Volume:	3.25	cu. ft	29.25	32.50	35.75	
Load Volume:	0.0000	cu. ft		Loading Density:	10.812	lbs./ft3
Number of Spaces:	0			Load Density (wet):	#DIV/0!	lbs./ft3
Spacer weight:	0			Dry Wood Density:	#DIV/0!	

	Red Oak	White Oak
Species	X	

Piece Size: Thick x Wide x Length	Weight lbs	Meter Moisture Content Dry Uncorrected %			Ave. MC x Weight	Volume Cubic Inches
	5.65	27.50	18.30	19.60	123.17	0.00
	6.38	20.00	20.00	21.30	130.3646667	0.00
	5.66	27.80	20.70	27.50	143.3866667	0.00
	7.24	27.30	24.20	23.30	180.5173333	0.00
	5.18	27.30	18.30	26.10	123.802	0.00
	5.03	25.40	19.30	19.00	106.8036667	0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
						0.00
				SUM MCxWT	808.0443333	16
						18
						20
						22
						24
						26
						28
						30
						32
						34

Test Load Weight: 35.14 lbs.

Dry Weight: 12.72 kg.

Average Moisture Content: %

Dry: 23.00

25.27
Must be 18-28

Wet: 20.17
must be 15-25

2015-01-27 - Caddy B415.1 - Test results - B415.1 Spreadsheet - Run #1.xlsPreload Data

Appendix C Calibration

alpha CONTROLS & INSTRUMENTATION

Report of Calibration

As Found / As Left

ilac-MRA ACCREDITED CALIBRATION CERT #2260.01

Procedure: Low Pressure: CAL VER /Ruska 7250LP: Revision: 1.2.A

UUT

Made by: Dwyer
Model: 2000-00
Serial No.: W80111CF89
ID No.: SBI-024
Description: Pressure Gauge

Calibration

Report No.: AC14051066-W80111CF89
Adjusted: No
Condition: In Tolerance
Calibration Date: 9-May-2014
Calibration Due: 9-May-2015

Customer

STOVE BUILDER INTERNATIONAL INC.
250 RUE DE COPENHAGUE
ST-AUSTIN-DE-DESMAURES, QC
G3A 2H3

Environment

Temperature: 25.1°C
Humidity: 42%RH

STATEMENT OF UNCERTAINTY: The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor K = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2005 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

This report shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

STANDARDS

Instrument	Model	ID No./Serial No.	Traceability No.	Recall Date
Low Pressure Calibrator	Ruska 7250LP	PRE-CAL-06	1500153193/1500153194	29-Aug-2014

REMARKS:

Calibrated in vertical position.

Performed by: Alex Radomishelsky

Reviewed by: Slava Peciurov

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001:2008

Alpha Controls & Instrumentation Inc., Suite 6, 361 Steelcase Road West, Markham, Ontario L3R 3V8 www.alphacontrols.com (800) 567-8686

Form: ROC101 Rev 8 *data: RUN*

SpecDIRECT POWERED BY Intertek

Appendix C Calibration (page 2 of 60)

alpha CONTROLS & INSTRUMENTATION

Report of Calibration
As Found / As Left

ilac-MRA ACCREDITED CALIBRATION CERT #2260.01

Procedure: Low Pressure: CAL VER /Ruska 7250LP: Revision: 1.2.A **Page 2 of 2**

UUT
Made by: Dwyer
Model: 2000-00
Serial No.: W80111CF89
ID No.: SBI-024
Description: Pressure Gauge

Calibration
Report No.: AC14051066-W80111CF89
Adjusted: No
Condition: In Tolerance
Calibration Date: 9-May-2014
Calibration Due: 9-May-2015

Test Description	STD	UUT	Error	Tolerance	Units	P/F	Uncertainty
LOW PRESSURE TEST							
0.000 inH2O	0.000	0.00	0.00000	±0.010	inH2O	Pass	5.78e-003
0.051 inH2O	0.051	0.05	-0.00100	±0.010	inH2O	Pass	5.78e-003
0.101 inH2O	0.101	0.10	-0.00100	±0.010	inH2O	Pass	5.78e-003
0.150 inH2O	0.150	0.15	0.00000	±0.010	inH2O	Pass	5.78e-003
0.201 inH2O	0.201	0.20	-0.00100	±0.010	inH2O	Pass	5.78e-003
0.254 inH2O	0.254	0.25	-0.00400	±0.010	inH2O	Pass	5.78e-003
0.200 inH2O	0.200	0.20	0.00000	±0.010	inH2O	Pass	5.78e-003
0.148 inH2O	0.148	0.15	0.00200	±0.010	inH2O	Pass	5.78e-003
0.098 inH2O	0.098	0.10	0.00200	±0.010	inH2O	Pass	5.78e-003
0.048 inH2O	0.048	0.05	0.00200	±0.010	inH2O	Pass	5.78e-003
-0.001 inH2O	-0.001	0.00	0.00100	±0.010	inH2O	Pass	5.78e-003

END OF REPORT

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001:2008

Alpha Controls & Instrumentation Inc., Suite 6, 361 Steelcase Road West, Markham, Ontario L3R 3V8 **www.alphacontrols.com** **(800) 567-8686**

Form: ROC101 Rev 8 *data: RUN*

SpecDIRECT POWERED BY Intertek

Appendix C Calibration (page 3 of 60)

Intertek

Page 1 of 1

Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	90R054300

Average Gas Meter y Factor
0.993

Calibration Date:	01-23-15
Calibrated by:	Vincent Pelletier
Calibration Frequency:	6-months
Next Calibration Due:	07-23-15
Instrument Range:	1.000 cfm
Standard Temp.:	77 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	30.27 "Hg
Signature/Date:	Vincent Pelletier 2015-01-23

Previous Calibration Comparision

Date	2014-05-01	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.002	0.0501	0.009
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.001
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	09-sept-14	
	Calib. Value	0.9930	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	167.605	173.302	178.706
Final Reference Meter	172.607	178.306	191.200
Initial DGM	892.200	897.900	903.300
Final DGM	897.200	902.900	915.800
Temp. Ref. Meter (°F), Tr	66.6	63.4	65.4
Temperature DGM (°F), Td	66.6	63.6	65.1
Time (Minutes)	25.8	34.1	130.3
Net Volume Ref. Meter, Vr	5.002	5.004	12.494
Net Volume DGM, Vd	5	5	12.5
Gas Meter y Factor =	**0.993**	**0.994**	**0.992**
Gas Meter y Factor Deviation (from avg.)	0.000	0.001	0.001
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.19405418

1. Deviation = |Average value for all runs - current run value|
2. y = [Vr x (y factor (ref)) x (Pb) x (Td + 460) / [Vd x (Pb + (dH / 13.6)) x (Tr + 460]
3. dH@ = 0.0317 x dH / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272

SBI-046 - 01-2015

Appendix C Calibration (page 4 of 60)

Intertek

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Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	98Z332226

Previous Calibration Comparision

Date	2014-05-05	Acceptable	
		Deviation (5%)	Deviation
y Factor	0.993	0.04965	0.005
Acceptance	Acceptable		

Average Gas Meter y Factor
0.998

Calibration Date:	02-06-15
Calibrated by:	Vincent Pelletier
Calibration Frequency:	6-months
Next Calibration Due:	07-23-15
Instrument Range:	1.000 cfm
Standard Temp.:	77 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	29.93 "Hg
Signature/Date:	Vincent Pelletier 2015-02-06

Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.001
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	09-sept-14	
	Calib. Value	0.9930	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	191.671	196.637	201.612
Final Reference Meter	196.637	201.612	210.829
Initial DGM	883.743	888.693	893.638
Final DGM	888.693	893.638	902.806
Temp. Ref. Meter (°F), Tr	66.0	66.6	66.8
Temperature DGM (°F), Td	66.2	66.6	66.4
Time (Minutes)	34.2	34.5	64.0
Net Volume Ref. Meter, Vr	4.966	4.975	9.217
Net Volume DGM, Vd	4.95	4.945	9.168
Gas Meter y Factor =	**0.997**	**0.999**	**0.998**
Gas Meter y Factor Deviation (from avg.)	0.001	0.001	0.000
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.144736842

1. Deviation = |Average value for all runs - current run value|
2. y = [Vr x (y factor (ref)) x (Pb) x (Td + 460) / [Vd x (Pb + (dH / 13.6)) x (Tr + 460]
3. dH@ = 0.0317 x dH / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272

SBI-046_02-2015 - PT

Appendix C Calibration (page 5 of 60)

Intertek

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Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	98Z332226

Previous Calibration Comparision

Date	2014-05-01	Acceptable	
		Deviation (5%)	Deviation
y Factor	0.994	0.0497	0.004
Acceptance	Acceptable		

Average Gas Meter y Factor
0.998

Calibration Date:	01-23-15
Calibrated by:	Vincent Pelletier
Calibration Frequency:	6-months
Next Calibration Due:	07-23-15
Instrument Range:	1.000 cfm
Standard Temp.:	77 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	30.27 "Hg
Signature/Date:	Vincent Pelletier 2015-01-23

Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.002
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	09-sept-14	
	Calib. Value	0.9930	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	151.252	156.781	162.108
Final Reference Meter	156.278	161.810	167.137
Initial DGM	608.800	614.300	619.600
Final DGM	613.800	619.300	624.600
Temp. Ref. Meter (°F), Tr	68.2	66.8	66.2
Temperature DGM (°F), Td	67.0	67.2	66.6
Time (Minutes)	46.6	26.6	33.3
Net Volume Ref. Meter, Vr	5.026	5.029	5.029
Net Volume DGM, Vd	5	5	5
Gas Meter y Factor =	**0.996**	**1.000**	**1.000**
Gas Meter y Factor Deviation (from avg.)	0.002	0.001	0.001
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.107227107

1. Deviation = |Average value for all runs - current run value|
2. y = [Vr x (y factor (ref)) x (Pb) x (Td + 460) / [Vd x (Pb + (dH / 13.6)) x (Tr + 460]
3. dH@ = 0.0317 x dH / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272

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Appendix C Calibration (page 6 of 60)

Intertek

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Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	90R054300

Previous Calibration Comparision

Date	2014-05-05	Acceptable	
		Deviation (5%)	Deviation
y Factor	0.998	0.0499	0.005
Acceptance	Acceptable		

Average Gas Meter y Factor
0.993

Calibration Date:	02-06-15
Calibrated by:	Vincent Pelletier
Calibration Frequency:	6-months
Next Calibration Due:	July 23rd, 2015
Instrument Range:	1.000 cfm
Standard Temp.:	76 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	29.93 "Hg
Signature/Date:	Vincent Pelletier 2015-02-02

Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.001
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	09-sept-14	
	Calib. Value	0.9930	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	191.671	196.637	201.612
Final Reference Meter	196.637	201.612	210.829
Initial DGM	209.000	214.000	219.000
Final DGM	214.000	219.000	228.266
Temp. Ref. Meter (°F), Tr	66.0	66.6	66.8
Temperature DGM (°F), Td	69.0	69.8	70.2
Time (Minutes)	34.2	34.5	64.0
Net Volume Ref. Meter, Vr	4.966	4.975	9.217
Net Volume DGM, Vd	5	5	9.266
Gas Meter y Factor =	**0.992**	**0.994**	**0.994**
Gas Meter y Factor Deviation (from avg.)	0.001	0.001	0.001
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.14619883

1. Deviation = |Average value for all runs - current run value|
2. y = [Vr x (y factor (ref)) x (Pb) x (Td + 460) / [Vd x (Pb + (dH / 13.6)) x (Tr + 460]
3. dH@ = 0.0317 x dH / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272

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Appendix C Calibration (page 7 of 60)

ULRICH

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Ulrich Metrology Inc.
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Montréal (Québec) H8T 1A1

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Fax (514) 631-6122
info@ulrich.ca
www.ulrich.ca

CLAS NRC CNRC CLAS-1888-01

ACCREDITATION ISO 17025
SCC Scope Number 220

CALIBRATION CERTIFICATE

Certificate no.:	400776	**Calibration date:**	February 13, 2014
Identification:	SBI-096	**Certificate issued:**	February 13, 2014
Description:	CALIBRATOR, OMEGA CL23A	**Interval:**	12 months
Size:	TC K/J/T	**Due date:**	February 13, 2015
Manufacturer:	OMEGA	**Procedure no.:**	MET/CAL
Model no.:	CL23A	**Environment:**	CLAS Type 2 Laboratory
Serial no.:	T-256137	**Temperature:**	23 ± 2°C
		Humidity:	35 - 55% RH
		Metrologist:	NIN

Property of: SBI
250 RUE DE COPENHAGUE
ST-AUGUSTIN-DE-DESMAURES, QC G3A 2H3

Approved by: David Llorens, Quality Manager

This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and Ulrich Metrology's quality manual QM-09 Revision 9. Measurement results provided are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST), a national laboratory of another country signatory to the CIPM Mutual Recognition Arrangement (MRA), or a calibration laboratory accredited by an accrediting body with which Canada has an equivalence agreement.

CALIBRATION STANDARDS

See notes below.

MEASUREMENT UNCERTAINTY

The above listed instrument meets or exceeds all specifications as stated in the reference procedure, unless noted otherwise. For measurement results associated with the conformance to a tolerance, the uncertainty in the measurement system did not exceed 25% (4:1 test uncertainty ratio) of the acceptable tolerance for each characteristic calibrated, unless otherwise noted in the report.

CALIBRATION DATA

See next page for measurement results.

Notes:

9V battery replaced.

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and traceability to the International System of Units (SI) or to standards acceptable to the CLAS program. This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council of Canada (SCC). Neither CLAS nor SCC guarantee the accuracy of individual calibrations by accredited laboratories.

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166727 P

Page 1 of 1

Appendix C Calibration (page 8 of 60)

ULRICH
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Ulrich Metrology inc.
9912, Côte-de-Liesse
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Fax (514) 631-6122
info@ulrich.ca
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CALIBRATION DATA

Certificate no.: 400776
Identification: SBI-096
Description: CALIBRATOR THERMOMETER
Serial no.: T-256137
Procedure: Omega CL23A: 5520A-M

Result: PASS
Condition: FOUND-LEFT

CALIBRATION STANDARDS

Identification	Description	Manufacturer	Model no.	Cal. Date	Due Date
8608002	CALIBRATOR	FLUKE	5520A	2013/11/21	2014/11/30

MEASUREMENT RESULTS (Per MET/CAL)

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	PASS/ FAIL	TUR
Temperature measurements are performed by electrical simulation.						
DISPLAY CALIBRATION						
Did all segments of the display illuminate?						
Result of Operator Evaluation					PASS	
THERMOMETER CALIBRATION						
K Type Thermocouple						
-200.0degF		-200.3	-201.0	-199.0	PASS	1.7
-60.0degF		-60.1	-61.0	-59.0	PASS	3.1
-40.0degF		-40.3	-40.5	-39.5	PASS	1.5
32.0degF		31.7	31.5	32.5	PASS	1.7
1240.0degF		1239.8	1239.5	1240.5	PASS	1.1
1260.0degF		1259.8	1259.5	1260.5	PASS	1.1
2500.0degF		2499.8	2499.0	2501.0	PASS	1.4
J Type Thermocouple						
-200.0degF		-199.9	-201.0	-199.0	PASS	2.1
-60.0degF		-59.8	-61.0	-59.0	PASS	3.5
-40.0degF		-40.0	-40.5	-39.5	PASS	1.7
32.0degF		32.0	31.5	32.5	PASS	2.0
1240.0degF		1239.9	1239.5	1240.5	PASS	1.6
1260.0degF		1259.9	1259.5	1260.5	PASS	1.6
1400.0degF		1399.9	1399.4	1400.6	PASS	1.8
T Type Thermocouple						
-200.0degF		-200.0	-201.0	-199.0	PASS	2.3
-60.0degF		-59.8	-61.0	-59.0	PASS	2.3
-40.0degF		-40.0	-40.5	-39.5	PASS	1.2
32.0degF		31.9	31.5	32.5	PASS	1.7
750.0degF		749.9	749.5	750.5	PASS	2.0
CALIBRATOR CALIBRATION						
K Type Thermocouple						
-200.0degF		-199.8	-201.0	-199.0	PASS	1.7

Calibration Data for Certificate No. 400776 Rtrslt01 Page 1 of 2

Appendix C Calibration (page 9 of 60)

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PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	PASS/ FAIL	TUR
-60.0degF		-59.9	-61.0	-59.0	PASS	3.1
-40.0degF		-39.9	-40.5	-39.5	PASS	1.5
32.0degF		32.0	31.5	32.5	PASS	1.7
1240.0degF		1240.3	1239.5	1240.5	PASS	1.1
1260.0degF		1260.3	1259.5	1260.5	PASS	1.1
2500.0degF		2500.6	2499.0	2501.0	PASS	1.4
J Type Thermocouple						
-200.0degF		-200.0	-201.0	-199.0	PASS	2.1
-60.0degF		-60.2	-61.0	-59.0	PASS	3.5
-40.0degF		-40.0	-40.5	-39.5	PASS	1.7
32.0degF		31.9	31.5	32.5	PASS	2.0
1240.0degF		1240.3	1239.5	1240.5	PASS	1.6
1260.0degF		1260.2	1259.5	1260.5	PASS	1.6
1400.0degF		1400.0	1399.4	1400.6	PASS	1.8
T Type Thermocouple						
-200.0degF		-200.3	-201.0	-199.0	PASS	2.3
-60.0degF		-60.2	-61.0	-59.0	PASS	2.3
-40.0degF		-40.0	-40.5	-39.5	PASS	1.2
32.0degF		31.8	31.5	32.5	PASS	1.7
750.0degF		750.0	749.5	750.5	PASS	2.0

End of Test Data

Calibration Data for Certificate No. 400776 RtrsIt01 Page 2 of 2

Appendix C Calibration (page 10 of 60)

MICRO PRECISION CALIBRATION INC.

MICRO PRECISION CALIBRATION
22835 INDUSTRIAL PLACE
GRASS VALLEY CA 95949
530-268-1860

Certificate of Calibration

Date: Oct 15, 2014 **Cert No.** 222008122277772

Customer:
STOVE BUILDERS INTERNATIONAL INC.
PORTES 11-12
250 DE COPENHAGUE
SAINT-AUGUSTIN-DE-DESMAURES QC G3A 2H3

Work Order #: SAC-70067952

MPC Control #:	DA5991	Serial Number:	79977
Asset ID:	SBI-097	Department:	N/A
Gage Type:	ANEMOMETER	Performed By:	JACK R. WERTZ III
Manufacturer:	EUROTRON INSTRUMENTS	Received Condition:	IN TOLERANCE
Model Number:	VT 50	Returned Condition:	IN TOLERANCE
Size:	N/A	Cal. Date:	October 15, 2014
Temp/RH:	68°F / 38 %	Cal. Interval:	12 MONTHS
		Cal. Due Date:	October 15, 2015

Calibration Notes:

Test Points

Seq.	Description	Standard	Tolerance -	Tolerance +	As Found	As Left	UOM	Result
1	Tested at: (0 - 590)	120.0	104.4	135.6	111.0	111.0	FPM	Passed
2	Tested at: (0 - 590)	240.0	220.8	259.2	225.0	225.0	FPM	Passed
3	Tested at: (0 - 590)	350.0	327.5	372.5	334.0	334.0	FPM	Passed
4	Tested at: (0 - 590)	470.0	443.9	496.1	451.0	451.0	FPM	Passed
5	Tested at: (0 - 590)	590.0	560.3	619.7	572.0	572.0	FPM	Passed
6	Tested at: (0 - 5900)	1,200.0	1124.0	1276.0	1,138.0	1,138.0	FPM	Passed
7	Tested at: (0 - 5900)	2,400.0	2288.0	2512.0	2,321.0	2,321.0	FPM	Passed
8	Tested at: (0 - 5900)	3,500.0	3355.0	3645.0	3,399.0	3,399.0	FPM	Passed
9	Tested at: (0 - 5900)	4,700.0	4519.0	4881.0	4,584.0	4,584.0	FPM	Passed
10	Tested at: (0 - 5900)	5,900.0	5683.0	6177.0	5,757.0	5,757.0	FPM	Passed
11	Tested at: (0 -1177)	235.0	233.9	248.0	234.0	234.0	CFM	Passed
12	Tested at: (0 -1177)	470.0	461.9	490.1	463.0	463.0	CFM	Passed
13	Tested at: (0 -1177)	705.0	689.8	732.1	703.0	703.0	CFM	Passed

Calibrating Technician: JACK R. WERTZ III

QC Approval: BRIAN GOLD

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA's Publication and NIST Technical Note 1297, 1994 Edition. Services rendered comply with ISO 17025:2005, ANSI/NCSL Z540-1, MPC Quality Manual, MPC CSD and with customer purchase order instructions.

Calibration cycles and resulting due dates were submitted/approved by the customer. Any number of factors may cause an instrument to drift out of tolerance before the next scheduled calibration. Recalibration cycles should be based on frequency of use, environmental conditions and customer's established systematic accuracy. The information on this report, pertains only to the instrument identified.

All standards are traceable to SI through the National Institute of Standards and Technology (NIST) and/or recognized national or international standards laboratories. Services rendered include proper manufacturer's service instruction and are warranted for no less than thirty (30) days. This report may not be reproduced in part or in a whole without the prior written approval of the issuing MPC lab.

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Appendix C Calibration (page 11 of 60)

MICRO PRECISION CALIBRATION INC.

MICRO PRECISION CALIBRATION
22835 INDUSTRIAL PLACE
GRASS VALLEY CA 95949
530-268-1860

Certificate of Calibration

Date: Oct 15, 2014 **Cert No. 222008122277772**

14	Tested at: (0 -1177)	940.0	917.8	974.2	925.0	925.0	CFM	Passed
15	Tested at: (0 -1177)	1,170.0	1140.9	1211.1	1,158.0	1,158.0	CFM	Passed
16	Tested at: (Deg F)	-4.0	-4.7	-3.3	-4.2	-4.2	Deg F	Passed
17	Tested at: (Deg F)	45.0	43.5	46.5	44.5	44.5	Deg F	Passed
18	Tested at: (Deg F)	90.0	87.6	92.4	89.4	89.4	Deg F	Passed
19	Tested at: (Deg F)	135.0	131.7	138.3	133.9	133.9	Deg F	Passed
20	Tested at: (Deg F)	176.0	171.8	180.1	175.0	175.0	Deg F	Passed

Standards Used to Calibrate Equipment

I.D.	Description.	Model	Serial	Manufacturer	Cal. Due Date	Traceability #
CJ5100	WIND TUNNEL WITH CONTROLLER	JS-500	375/305	INTERACTIVE INSTRUMENTS	Nov 19, 2014	220081202222799
CR6800	HUMIDITY GENERATOR	2500	0012263	THUNDER SCIENTIFIC CORPORATION	Aug 7, 2015	220081222215871
CL7456	STANDARD PLATINUM RESISTANCE THERMOMETER PROBE	5681	1595	FLUKE	Dec 4, 2015	A7B16006
CL7223	BLACK STACK	1560/2560	A07486/A07485/A07728	HART SCIENTIFIC, INC.	Oct 15, 2015	222008122276837

Procedures Used in this Event

Procedure Name	Description
33K6-4-1769-1	Air Velocity, Temperature and Flow Meters

Calibrating Technician: JACK R. WERTZ III

QC Approval: BRIAN GOLD

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA's Publication and NIST Technical Note 1297, 1994 Edition. Services rendered comply with ISO 17025:2005, ANSI/NCSL Z540-1, MPC Quality Manual, MPC CSD and with customer purchase order instructions.

Calibration cycles and resulting due dates were submitted/approved by the customer. Any number of factors may cause an instrument to drift out of tolerance before the next scheduled calibration. Recalibration cycles should be based on frequency of use, environmental conditions and customer's established systematic accuracy. The information on this report, pertains only to the instrument identified.

All standards are traceable to SI through the National Institute of Standards and Technology (NIST) and/or recognized national or international standards laboratories. Services rendered include proper manufacturer's service instruction and are warranted for no less than thirty (30) days. This report may not be reproduced in part or in a whole without the prior written approval of the issuing MPC lab.

Page 2 of 2 (CERT, Rev 3)

Appendix C Calibration (page 12 of 60)

CERTIFICATE OF NIST TRACEABLE CALIBRATION

Calibration Certificate No: 44493

LABORATORY ACCREDITATION BUREAU ACCREDITED
Certificate # L2115-1 Calibration

ISO 17025-2005 ACCREDITED

Customer Information

Customer: SBI St-Augustin

Address : 250, De Copenhague
Doors 11-12
St-Augustin-de-Desmaures

Customer PO #: 41183

Calibration Procedure Information

Procedure ID: GTP FLOW_INDI Revision #: 7 Revision Date: 1/6/2013

Calibration Standards Information

Graftel ID	Manufacturer	Model #	Description	CAL Due
10074	Meriam	50MJ10-14	Laminar Flowmeter	3/3/2015
10075	Meriam	50MJ10-9	Laminar Flowmeter	6/20/2015
51202	Paroscientific	760-100A	Pressure, 100 Psia	8/22/2015
10062	Graftel	9202	5-Channel Temperature Sensor	8/24/2015
10128	Furness	FCO352	Diff Pressure	1/14/2016
60030	Paroscientific	760-100A	Pressure, 100 psia	11/21/2014
10159	HOBO	U12-011	Environment Monitor System	11/28/2014

Sensor Information

Manufacturer: American Meter
Description: Gas Meter
Method Used: Laminar
Model #: DTM-200A
Rated Accuracy: ± 1 % of Reading
Accuracy Specified By: AmericanMeter
Instrument ID#: SBI-103
Range: 0 to 250 cfh
Condition: Functional
Serial #: 07J264834
Comments: Calibration Date: 09-09-2014

The instruments(s) listed on this certificate have been calibrated against standards traceable to the National Institue of Standards and Technology (NIST) or compared to nationally or internationally recognized consensus standards. The reported calibration uncertainty has a confidence level of 95% (k=2). A calibration uncertainty ratio of 4:1 was maintained unless required uncertainty is supported by analysis. Graftel, LLC. Quality Assurance System complies with applicable requirements of ISO/IEC-17025-2005 and ISO 9001: 2008. All results contained within this certificate relate only to item(s) calibrated. This certificate shall not be reproduced except in full and with the written consent of Graftel, LLC. Acceptance Criteria per Simple Acceptance Rule: Measurement Uncertainty is not applied to the measured value when in/out of tolerance statement is made.

Performed By: L. Chan Date: 09/09/2014
L. Chan
Calibration Technician

Page 1 of 2

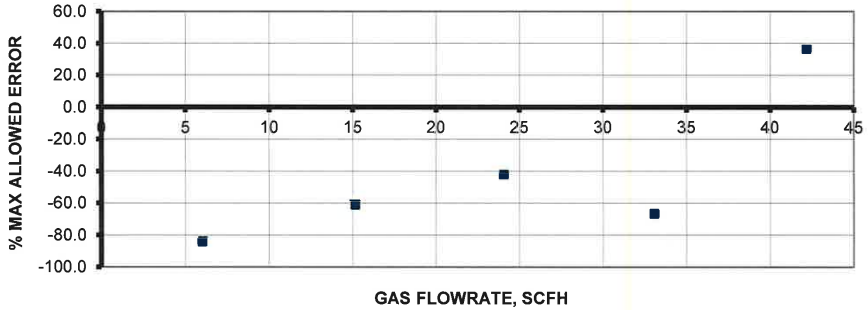
GRAFTEL, LLC. 870 Cambridge Drive, Elk Grove Village, IL 60007 847.364.2600
www.graftel.com

Appendix C Calibration (page 13 of 60)

ATTACHMENT TO CALIBRATION CERTIFICATE 44493
AS FOUND DATA
Page 2 of 2

Air Flow Rate From Standard, scfh	Air Vol From Standard, scf	Air Vol From Meter, cf	Air vol From Meter, scf	Diff Air Vol STD - METER scf	% Proof	Measurement Uncertainty, scf	STATUS
6.034	0.2837	0.30	0.286	-0.002	99.17	0.002	Pass
15.153	0.9510	1.00	0.957	-0.006	99.39	0.005	Pass
24.073	0.9567	1.00	0.961	-0.004	99.58	0.005	Pass
33.091	1.9155	2.00	1.928	-0.013	99.34	0.010	Pass
42.180	1.9453	2.00	1.938	0.007	100.36	0.010	Pass

ERROR CHART



INSTRUMENT SPECIFICATIONS		
Test Gas	Air	
Standard Pressure,Meter	14.73	psia
Standard Temperature,Meter	60	F
Rated Accuracy	1	% Rding
Full Scale Flow Rate	250	scfh Natural Gas @ 1/2 inch WC
LABORATORY AMBIENT CONDITIONS		
Pressure	14.33	psia
Humidity	48.44	% RH
Temperature	71.38	F

Flow - Humidity - Temperature - Pressure - Design - Consulting - Engineering

NIST Traceable Calibration Data Sheet

Graftel, LLC. 870 Cambridge Drive, Elk Grove Village, IL 60007
P. 847-364-2600 F. 847-364-2699
www.graftel.com

Appendix C Calibration (page 14 of 60)

Rapport d'étalonnage No. ca0003-424-061114
Mettler Toledo
Service Business Unit Industrial
1900 Polaris Parkway
Columbus, Ohio 43240
1-800-METTLER

Accrédité par l'American Association for Laboratory Accreditation (A2LA)
CERT.CALIBRATION #1902.02

METTLER TOLEDO

ISO 9001 Registered
ANSI/NCSL Z540-1 Accrédité

Certificat d'étalonnage

Client

Société :	SBI Fabricant De Poeles		
Adresse :	250 Rue de Copenhague		
Ville :	Saint-Augustin-De-Desmaures	*État/Province :*	Quebec
Code postal :	G3A 2H3	Astea Customer ID:	300276257

Instrument

Constructeur :	SARTORIUS	*Modèle de terminal :*	N/A
Modèle :	TE214S	*# série du terminal:*	N/A
No de série :	25851066	*# série de l'imprimant*	N/A
Capacité :	210 g		N/A
Résolution :	0,0001 g	*Nbre de Divisions:*	2100000
Classe :	I	*Procédure utilisée :*	NIST Handbook 44
No./ID d'inventaire:	sbi-206		
Procédure:	Le présent certificat est émis conformément aux conditions de certification accordées par l'A2LA, en vertu de la norme ISO/IEC 17025. A2LA a évalué la capacité de mesure du laboratoire et la traçabilité des normes nationales reconnues.		

Date de calibrage :	11-juin-2014	*Date, prochaine Cal.*	30-juin-2015
Signataire autorisé (A2LA) :	Dany Careau	*Signature:*	ELECTRONIC SIGNATURE

Étalons de travail

Retracabilité: Les poids de test utilisés se réfèrent au National Institute of Standards and Technology.

Jeu de poids no :	*Traçabilité NIST No.:*	*Classe ASTM/OIML*	*Date d'étalonnage :*	*Date proch. étalonnage*
493	MT00957	F1	24-févr-2014	28-févr-2015

Version Logiciel : 4.5.6.9

Page 1 sur 3

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Appendix C Calibration (page 15 of 60)

Rapport d'étalonnage No. ca0003-424-061114

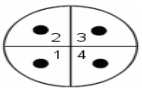
METTLER TOLEDO

Résultats de mesure

La température : 23 °C

Les conditions ambiantes ont été vérifiées afin d'assurer l'exactitude de l'étalonnage.

Test de variation



		Avant Réglage	Après Réglage
Poids Appliqués	*Position*	*Valeur lue*	*Valeur lue*
1: 50 g	*Position 1*	50,0003 g	50,0001 g
2: 50 g	*Position 2*	50,0003 g	50,0001 g
3: 50 g	*Position 3*	50,0003 g	50,0001 g
4: 50 g	*Position 4*	50,0003 g	50,0001 g
Erreur maximum :		0,0003 g	0,0001 g
Max Erreur Admissible :		0,0003 g	0,0003 g

Linéarité

	Avant réglage					
	Poids Appliqués	*Valeur lue*	*Erreur*		*Erreur admissible*	*Dans la Tolérance*
Zero 1,00	0,0000 g	0,0000 g	0,0000 g	0 d	1 d	OUI
2,00	1,0000 g	1,0000 g	0,0000 g	0 d	1 d	OUI
3,00	10,0000 g	10,0001 g	0,0001 g	1 d	2 d	OUI
4,00	50,0000 g	50,0004 g	0,0004 g	4 d	3 d	NON
5,00	100,0000 g	100,0008 g	0,0008 g	8 d	3 d	NON
Max 6,00	200,0000 g	200,0011 g	0,0011 g	11 d	3 d	NON

☐ Méthode de substitution utilisée

Version Logiciel : 4.5.6.9

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Appendix C Calibration (page 16 of 60)

Rapport d'étalonnage No. ca0003-424-061114

METTLER TOLEDO

	Après réglage					
	Poids Appliqués	*Valeur lue*	*Erreur*		*Erreur admissible*	*Dans la Tolérance*
Zero 1,00	0,0000 g	0,0000 g	0,0000 g	0 d	1 d	OUI
2,00	1,0000 g	1,0000 g	0,0000 g	0 d	1 d	OUI
3,00	10,0000 g	10,0000 g	0,0000 g	0 d	2 d	OUI
4,00	50,0000 g	50,0001 g	0,0001 g	1 d	3 d	OUI
5,00	100,0000 g	100,0001 g	0,0001 g	1 d	3 d	OUI
Max 6,00	200,0000 g	200,0000 g	0,0000 g	0 d	3 d	OUI

☐ Méthode de substitution utilisée

Un réglage de la balance a été requis
Si non, les résultats "avant réglage" correspondent aux résultats tel que laissé.

☑ **OUI** ☐ **NON**

Répétabilité

Poids appliqués : 10,0000 g

	Chargé	*Vide*	*Différence*
1	10,0000 g	0,0000 g	10 g
2	10,0000 g	0,0000 g	10 g
3	10,0000 g	0,0000 g	10 g
	Erreur maximale :	0,0000 g	0,0 d
	Tolérance :	0,0002 g	2 d

Incertitude

Mesure de l'incertitude = 0,00015 g

L'incertitude de mesure représente les incertitudes étendues selon un facteur de sécurité K=2 générant un niveau de confiance approximatif de 95 %. Des dispositions doivent être prises en matière d'environnement au lieu d'étalonnage, d'incertitude induite par l'article en étalonnage et d'effets indésirables causés par le transport du matériel d'étalonnage. Ces facteurs pourraient entraîner une incertitude plus grande que le CMC.

Remarques

Aucune.

Version Logiciel : 4.5.6.9

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Appendix C Calibration (page 17 of 60)

ULRICH

Ulrich Métrologie inc.
Ulrich Metrology Inc.
9912, Côte-de-Liesse
Montréal (Québec) H8T 1A1

Tél. (514) 631-6653
Fax (514) 631-6122
info@ulrich.ca
www.ulrich.ca

ACCREDITATION ISO 17025

CALIBRATION CERTIFICATE

Certificate no.:	414979	**Calibration date:**	May 12, 2014
Identification:	SBI-212	**Certificate issued:**	May 12, 2014
Description:	THERMO-HYGROMETER, AMPROBE TH-3	**Interval:**	12 months
Manufacturer:	AMPROBE	**Due date:**	May 12, 2015
Model no.:	TH-3	**Procedure no.:**	MET/CAL
Serial no.:	100906351	**Environment:**	CLAS Type 2 Laboratory
		Temperature:	23 ± 2°C
		Humidity:	35 - 55% RH
		Metrologist:	MIC

Property of: SBI
250 RUE DE COPENHAGUE
ST-AUGUSTIN-DE-DESMAURES, QC G3A 2H3

Approved by: David Llorens
David Llorens, Quality Manager

This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and Ulrich Metrology's quality manual QM-09 Revision 9. Measurement results provided are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST), a national laboratory of another country signatory to the CIPM Mutual Recognition Arrangement (MRA), or a calibration laboratory accredited by an accrediting body with which Canada has an equivalence agreement.

CALIBRATION STANDARDS

See notes below.

MEASUREMENT UNCERTAINTY

The above listed instrument meets or exceeds all specifications as stated in the reference procedure, unless noted otherwise. For measurement results associated with the conformance to a tolerance, the uncertainty in the measurement system did not exceed 25% (4:1 test uncertainty ratio) of the acceptable tolerance for each characteristic calibrated, unless otherwise noted in the report.

CALIBRATION DATA

See next page for measurement results.

Notes:

9 volts square battery replaced.

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234528P

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Appendix C Calibration (page 18 of 60)

ULRICH

Ulrich Métrologie inc.
Ulrich Metrology inc.
9912, Côte-de-Liesse
Montréal (Québec) H8T 1A1

Tél. (514) 631-6653
Fax (514) 631-6122
info@ulrich.ca
www.ulrich.ca

CALIBRATION DATA

Certificate no.: 414979
Identification: SBI-212
Description: THERMO-HYGROMETER
Serial no.: 100906351
Procedure: Amprobe TH-3: 2500ST-LT-M

Result: PASS
Condition: FOUND-LEFT

CALIBRATION STANDARDS

Identification	Description	Manufacturer	Model no.	Cal. Date	Due Date
1304953	HUMIDITY GENERATOR	THUNDER SCIENTIFIC	2500ST-LT	2014/04/30	2015/04/30

MEASUREMENT RESULTS (Per MET/CAL)

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	ACCEPTANCE LIMITS HIGH	PASS/ FAIL	TUR
TEMPERATURE CALIBRATION						
23°C						
22.98degC		22.80	22.18	23.78	PASS	
RELATIVE HUMIDITY CALIBRATION AT 23°C						
20% RH						
20.03%		19.30	17.03	23.03	PASS	
50% RH						
50.01%		48.00	47.01	53.01	PASS	
80% RH						
80.01%		77.20	77.01	83.01	PASS	

End of Test Data

Appendix C Calibration (page 19 of 60)

ULRICH

Ulrich Métrologie inc.
Ulrich Metrology Inc.
9912, Côte-de-Liesse
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Tél. (514) 631-6653
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www.ulrich.ca

ACCREDITATION ISO 17025

CALIBRATION CERTIFICATE

Certificate no.:	437753	**Calibration date:**	October 20, 2014
Identification:	SBI-213	**Certificate issued:**	October 20, 2014
Description:	THERMO-HYGROMETER, AMPROBE TH-3	**Interval:**	12 months
Manufacturer:	AMPROBE	**Due date:**	October 20, 2015
Model no.:	TH-3	**Procedure no.:**	MET/CAL
Serial no.:	101004044	**Environment:**	CLAS Type 2 Laboratory
		Temperature:	23 ± 2°C
		Humidity:	35 - 55% RH
		Metrologist:	NFS

Property of: SBI
250 RUE DE COPENHAGUE
ST-AUGUSTIN-DE-DESMAURES, QC G3A 2H3

Approved by: David Llorens, Quality Manager

This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and Ulrich Metrology's quality manual QM-09 Revision 9. Measurement results provided are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST), a national laboratory of another country signatory to the CIPM Mutual Recognition Arrangement (MRA), or a calibration laboratory accredited by an accrediting body with which Canada has an equivalence agreement.

CALIBRATION STANDARDS

See notes below.

MEASUREMENT UNCERTAINTY

The above listed instrument meets or exceeds all specifications as stated in the reference procedure, unless noted otherwise. For measurement results associated with the conformance to a tolerance, the uncertainty in the measurement system did not exceed 25% (4:1 test uncertainty ratio) of the acceptable tolerance for each characteristic calibrated, unless otherwise noted in the report.

CALIBRATION DATA

See next page for measurement results.

Notes:

EQUIPMENT RECEIVED OUT OF SPECIFICATIONS:

High humidity is out of tolerance @80% (reading of 75.7% instead of 77% minimum).
No adjustment. No support from manufacturer.

LIMITED CALIBRATION

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226673L

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Appendix C Calibration (page 20 of 60)

ULRICH
Ulrich Métrologie inc.
Ulrich Metrology inc.
9912, Côte-de-Liesse
Montréal (Québec) H8T 1A1

Tél. (514) 631-6653
Fax (514) 631-6122
info@ulrich.ca
www.ulrich.ca

CALIBRATION DATA

Certificate no.: 437753
Identification: SBI-213
Description: THERMO-HYGROMETER
Serial no.: 101004044
Procedure: Amprobe TH-3: 2500ST-LT-M

Result: PASS
Condition: FOUND-LEFT

CALIBRATION STANDARDS

Identification	Description	Manufacturer	Model no.	Cal. Date	Due Date
1304953	HUMIDITY GENERATOR	THUNDER SCIENTIFIC	2500ST-LT	2014/04/30	2015/04/30

MEASUREMENT RESULTS (Per MET/CAL)

	TRUE	TEST	ACCEPTANCE LIMITS		PASS/
TEMPERATURE CALIBRATION					
23°C					
23.04degC		23.40	22.24	23.84	PASS
RELATIVE HUMIDITY CALIBRATION AT 23°C					
20% RH					
20.01%		18.80	17.01	23.01	PASS
50% RH					
50.02%		48.70	47.02	53.02	PASS
80% RH					
80.00%		75.70	77.00	83.00	FAIL

End of Test Data

Appendix C Calibration (page 21 of 60)

Rapport d'étalonnage No. ca0003-221-031114
Mettler Toledo
Service Business Unit Industrial
1900 Polaris Parkway
Columbus, Ohio 43240
1-800-METTLER

Accrédité par l'American Association for Laboratory Accreditation (A2LA)
CERT.CALIBRATION #1902.02

METTLER TOLEDO

ISO 9001 Registered
ANSI/NCSL Z540-1 Accrédité

Certificat d'étalonnage

Client

Société :	SBI Fabricant De Poeles		
Adresse :	250 Rue de Copenhague		
Ville :	Saint-Augustin-De-Desmaures	*État/Province :*	Quebec
Code postal :	G3A 2H3	Astea Customer ID:	300276257

Instrument

Constructeur :	Ohaus	*Modèle de terminal :*	N/A
Modèle :	FD15H	*# série du terminal:*	N/A
No de série :	B144397174	*# série de l'imprimant*	N/A
Capacité :	15000 g		N/A
Résolution :	1 g	*Nbre de Divisions:*	15000
Classe :	III	*Procédure utilisée :*	NIST Handbook 44
No./ID d'inventaire:	SBI-222		
Procédure:	Le présent certificat est émis conformément aux conditions de certification accordées par l'A2LA, en vertu de la norme ISO/IEC 17025. A2LA a évalué la capacité de mesure du laboratoire et la traçabilité des normes nationales reconnues.		

Date de calibrage :	11-mars-2014	*Date, prochaine Cal.*	31-mars-2015
Signataire autorisé (A2LA) :	Dany Careau	*Signature:*	ELECTRONIC SIGNATURE

Étalons de travail

Retracabilité: Les poids de test utilisés se réfèrent au National Institute of Standards and Technology.

Jeu de poids no :	*Traçabilité NIST No.:*	*Classe ASTM/OIML*	*Date d'étalonnage :*	*Date proch. étalonnage*
TB2	M13-0254	M1	14-août-2013	14-août-2014
Série Q	1401320	M1	30-déc-2013	30-déc-2014
MTP4	MT0032333	F1	6-juin-2013	5-juin-2014

Version Logiciel : 4.5.5.2

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Appendix C Calibration (page 22 of 60)

Rapport d'étalonnage No. ca0003-221-031114

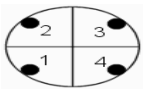
METTLER TOLEDO

Résultats de mesure

La température : 70 °F

Les conditions ambiantes ont été vérifiées afin d'assurer l'exactitude de l'étalonnage.

Test de variation



Poids Appliqués	Position	Avant Réglage Valeur lue
1: 3000 g	Position 1	3001 g
2: 3000 g	Position 2	2999 g
3: 3000 g	Position 3	3000 g
4: 3000 g	Position 4	2999 g
Erreur maximum :		2 g
Max Erreur Admissible :		3 g

Linéarité

	Avant réglage					
	Poids Appliqués	Valeur lue	Erreur		Erreur admissible	Dans la Tolérance
Zero 1,00	0 g	0 g	0 g	0 d	1 d	OUI
2,00	500 g	500 g	0 g	0 d	1 d	OUI
3,00	4000 g	4000 g	0 g	0 d	3 d	OUI
4,00	10000 g	10000 g	0 g	0 d	5 d	OUI
5,00	12000 g	12000 g	0 g	0 d	5 d	OUI
Max 6,00	15000 g	14999 g	-1 g	1 d	5 d	OUI

☐ Méthode de substitution utilisée

Un réglage de la balance a été requis
Si non, les résultats "avant réglage" correspondent aux résultats tel que laissé.

☐ **OUI** ☑ **NON**

Version Logiciel : 4.5.5.2

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Appendix C Calibration (page 23 of 60)

Rapport d'étalonnage No. ca0003-221-031114

METTLER TOLEDO

Répétabilité

Poids appliqués : 5000 g

	Chargé	*Vide*	*Différence*
1	5000 g	0 g	5000 g
2	5000 g	0 g	5000 g
3	5000 g	0 g	5000 g
	Erreur maximale :	0 g	0,0 d
	Tolérance :	5 g	5 d

Incertitude

Mesure de l'incertitude = 0,60 g

L'incertitude de mesure représente les incertitudes étendues selon un facteur de sécurité K=2 générant un niveau de confiance approximatif de 95 %. Des dispositions doivent être prises en matière d'environnement au lieu d'étalonnage, d'incertitude induite par l'article en étalonnage et d'effets indésirables causés par le transport du matériel d'étalonnage. Ces facteurs pourraient entraîner une incertitude plus grande que le CMC.

Remarques

TR-ca0003 - CalibrationDate Ancienne valeur = `10-03-14` Nouvelle valeur = `11-03-14`11-mars-14 11:42:50

Version Logiciel : 4.5.5.2

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Appendix C Calibration (page 24 of 60)

Date: 2015-01-19

Equipment: SBI-235 Temperature: 68 F
Accuracy: 0.01 R.H.: 36%
Reference: Horloge parlante

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.00**	**%**	
	Ave A.D.	0.00	%
Standard	Reading	A.D.	
82630.0	82630.0	0.00	

Engineer: Vincent Pelletier

Appendix C Calibration (page 25 of 60)

Certificate No: MT0031229

METTLER-TOLEDO, LLC
1900 Polaris Pkwy
Columbus, OH 43240
1-800-METTLER

METTLER TOLEDO

ACCREDITED
Cert # 1788.01

Mass Calibration Certificate

Customer Information

Customer Name:	Sbi	*City:*	Saint-Augustin-De-Dema
Address:	250 Rue Copenhague	*State / Province:*	QC
Purchase Order:	34985	*Zip / Postal Code:*	G3A 2H3

Measurement and Test Equipment Identification

Serial Number:	B316239338	*Date Received:*	4/17/2013
Manufacturer:	Mettler-Toledo	*Condition:*	*Excellent*
Asset number:		*Tolerance Class:*	OIML E2

Environmental Conditions

Temperature:	20.430 °C	*Relative Humidity:*	47.680 *%RH*
Barometric Pressure:	988.9080 *hPa*	*Air Density:*	1.1688 *kg/m³*

The standards used to perform this calibration are traceable to NIST through METTLER TOLEDO traceability number: MT5061

This certificate is issued in accordance with the conditions granted by A2LA under Certificate number 1788.01, which is based on ISO/IEC17025. A2LA has assessed the measurement capability of the laboratory and its traceability to recognized national standards. All uncertainties in this certificate are reported at a 95% (k=2) confidence factor.

This certificate may not be partially reproduced, except with prior written permission of the issuing laboratory and A2LA.

Calibration Date:	04/17/2013	*Next Calibration Due:*	04/16/~~2014~~ 2015 CP 2014-06-23
Calibration Technician:	Kathy Weatherbie	*Signature:*	Ann J Anderson — Metrology Specialist — 04/18/2013 Date

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Appendix C Calibration (page 26 of 60)

Certificate No: MT0031229

As Found Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
100 mg	(B316239338)	0.1000032436	0.1000031492	0.0017	0.016	7.95

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Appendix C Calibration (page 27 of 60)

Certificate No: MT0031229

As Left Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
100 mg	(B316239338)	0.1000032436	0.1000031492	0.0017	0.016	7.95

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Appendix C Calibration (page 28 of 60)

Certificate No: MT0031229

Comparators Used

#	Equipment Used	Serial Number	Equipment Type	Calibration Due
#6 :	a5XL	B010016731	Automated Mass Comparator	08/31/2013

Comments

No Remarks

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Appendix C Calibration (page 29 of 60)

Certificate No: MT0031229

Definitions

Nominal Value - The value as labeled on the weight or defined by shape in accordance with OIML R111 for milligram weights. The number within the parentheses after the nominal value is the serial number of the set to which the weight belongs.

True Mass - The mass value of the weight if measured in a vacuum.

Conventional Mass - For a mass at 20 °C, "Conventional Mass" is the mass of a reference standard of density 8000 kg/m³ which it balances in air with a density of 1.2 kg/m³. This value should be referenced when testing the accuracy of a weighing device using any of the nominal values contained in this certificate. The As Found results will equal the As Left in cases where no adjustment or replacement was required.

Uncertainty - All Uncertainty values are reported at 95% confidence level (k=2) . The uncertainty value does not include a component for the affects due to magnetism.

Tolerance - The acceptable range of deviation (positive and negative) from the nominal value, including the uncertainty, as defined by ASTM and OIML for the respective classes.

Density - The assumed density of the material used by the manufacturer.

Calibration Process - The METTLER TOLEDO procedure used to obtain the measurement results. All procedures are based on SOPs as defined in NIST Handbook 145. The same process is used to obtain the As Found and As Left results.

OOT - The As Found measurement result combined with the uncertainty exceeded the tolerance for the specified weight class.

A - Weight was adjusted after As Found testing to within the appropriate tolerance class.

R - The received weight was replaced due to an out of tolerance condition and the weight was not adjustable or the weight for this nominal value was missing.

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Appendix C Calibration (page 30 of 60)

Certificate No: MT0031137

METTLER-TOLEDO, LLC
1900 Polaris Pkwy
Columbus, OH 43240
1-800-METTLER

METTLER TOLEDO

ACCREDITED
Cert # 1788.01

Mass Calibration Certificate

Customer Information

Customer Name:	Sbi	*City:*	Saint-Augustin-De-Dema
Address:	250 Rue Copenhague	*State / Province:*	QC
Purchase Order:	34985	*Zip / Postal Code:*	G3A 2H3

Measurement and Test Equipment Identification

Serial Number:	B316238717	*Date Received:*	4/16/2013
Manufacturer:	Mettler-Toledo	*Condition:*	*Excellent*
Asset number:		*Tolerance Class:*	OIML F1, F2

Environmental Conditions

Temperature:	20.365 °C	*Relative Humidity:*	47.865 *%RH*
Barometric Pressure:	981.2060 *hPa*	*Air Density:*	1.1599 *kg/m³*

The standards used to perform this calibration are traceable to NIST through METTLER TOLEDO traceability number: MT5061

This certificate is issued in accordance with the conditions granted by A2LA under Certificate number 1788.01, which is based on ISO/IEC17025. A2LA has assessed the measurement capability of the laboratory and its traceability to recognized national standards. All uncertainties in this certificate are reported at a 95% (k=2) confidence factor.

This certificate may not be partially reproduced, except with prior written permission of the issuing laboratory and A2LA.

Calibration Date:	04/09/2013	*Next Calibration Due:*	04/15/~~2014~~ 2015 GP 2014-06-23
Calibration Technician:	Kathy Weatherbie	*Signature:*	Ann J Anderson — Metrology Specialist — 04/16/2013 Date

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Appendix C Calibration (page 31 of 60)

Certificate No: MT0031137

As Found Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
200 g	(B316238717)	200.001163	200.000974	0.035	3.0	7.95
10 g	(B316238717)	10.0000725	10.0000630	0.0078	0.20	7.95

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Appendix C Calibration (page 32 of 60)

Certificate No: MT0031137

As Left Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
200 g	(B316238717)	200.001163	200.000974	0.035	3.0	7.95
10 g	(B316238717)	10.0000725	10.0000630	0.0078	0.20	7.95

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Appendix C Calibration (page 33 of 60)

Certificate No: MT0031137

Comparators Used

#	Equipment Used	Serial Number	Equipment Type	Calibration Due
#11 :	a200XL	B010016733	Automated Mass Comparator	08/31/2013

Comments

No Remarks

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Appendix C Calibration (page 34 of 60)

Certificate No: MT0031137

Definitions

Nominal Value - The value as labeled on the weight or defined by shape in accordance with OIML R111 for milligram weights. The number within the parentheses after the nominal value is the serial number of the set to which the weight belongs.

True Mass - The mass value of the weight if measured in a vacuum.

Conventional Mass - For a mass at 20 °C, "Conventional Mass" is the mass of a reference standard of density 8000 kg/m³ which it balances in air with a density of 1.2 kg/m³. This value should be referenced when testing the accuracy of a weighing device using any of the nominal values contained in this certificate. The As Found results will equal the As Left in cases where no adjustment or replacement was required.

Uncertainty - All Uncertainty values are reported at 95% confidence level (k=2) . The uncertainty value does not include a component for the affects due to magnetism.

Tolerance - The acceptable range of deviation (positive and negative) from the nominal value, including the uncertainty, as defined by ASTM and OIML for the respective classes.

Density - The assumed density of the material used by the manufacturer.

Calibration Process - The METTLER TOLEDO procedure used to obtain the measurement results. All procedures are based on SOPs as defined in NIST Handbook 145. The same process is used to obtain the As Found and As Left results.

OOT - The As Found measurement result combined with the uncertainty exceeded the tolerance for the specified weight class.

A - Weight was adjusted after As Found testing to within the appropriate tolerance class.

R - The received weight was replaced due to an out of tolerance condition and the weight was not adjustable or the weight for this nominal value was missing.

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Appendix C Calibration (page 35 of 60)

alpha CONTROLS & INSTRUMENTATION

Report of Calibration
As Found / As Left

ilac-MRA ACCREDITED CALIBRATION CERT #2260.01

Procedure: Low Pressure: CAL VER /Ruska 7250LP: Revision: 1.2.A **Page 1 of 2**

UUT
Made by: Dwyer
Model: 0-0.20INH2O
Serial No.: N/A
ID No.: SBI-244
Description: Pressure Gauge

Calibration
Report No.: AC14021257-SBI-244
Adjusted: No
Condition: In Tolerance
Calibration Date: 14-Feb-2014
Calibration Due: 14-Feb-2015

Customer
STOVE BUILDER INTERNATIONAL INC.
250 RUE DE COPENHAGUE
ST-AUSTIN-DE-DESMAURES, QC
G3A 2H3

Environment
Temperature: 23.5°C
Humidity: 20%RH

STATEMENT OF UNCERTAINTY: The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor K = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2005 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

This report shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

STANDARDS

Instrument	Model	ID No./Serial No.	Traceability No.	Recall Date
Low Pressure Calibrator	Ruska 7250LP	PRE-CAL-06	1500153193/1500153194	29-Aug-2014

REMARKS:
Calibrated in vertical position.

Performed by: Alex Radomishelsky

Reviewed by: Slava Peciurov

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001:2008

Alpha Controls & Instrumentation Inc., Suite 6, 361 Steelcase Road West, Markham, Ontario L3R 3V8 **www.alphacontrols.com** **(800) 567-8686**

Form: ROC101 Rev 7 *data: RUN*

Appendix C Calibration (page 36 of 60)

alpha CONTROLS & INSTRUMENTATION

Report of Calibration
As Found / As Left

ilac-MRA ACCREDITED CALIBRATION CERT #2260.01

Procedure: Low Pressure: CAL VER /Ruska 7250LP: Revision: 1.2.A **Page 2 of 2**

UUT
Made by: Dwyer
Model: 0-0.20INH2O
Serial No.: N/A
ID No.: SBI-244
Description: Pressure Gauge

Calibration
Report No.: AC14021257-SBI-244
Adjusted: No
Condition: In Tolerance
Calibration Date: 14-Feb-2014
Calibration Due: 14-Feb-2015

Test Description	STD	UUT	Error	Tolerance	Units	P/F	Uncertainty
LOW PRESSURE TEST							
0.00000 inH2O	0.00000	0.0000	0.00000	±0.00800	inH2O	Pass	1.61e-004
0.05000 inH2O	0.05000	0.0500	0.00000	±0.00800	inH2O	Pass	1.61e-004
0.10000 inH2O	0.10000	0.1000	0.00000	±0.00800	inH2O	Pass	1.61e-004
0.15040 inH2O	0.15040	0.1500	-0.00040	±0.00800	inH2O	Pass	1.61e-004
0.20600 inH2O	0.20600	0.2000	-0.00600	±0.00800	inH2O	Pass	1.61e-004
0.14700 inH2O	0.14700	0.1500	0.00300	±0.00800	inH2O	Pass	1.61e-004
0.09600 inH2O	0.09600	0.1000	0.00400	±0.00800	inH2O	Pass	1.61e-004
0.04500 inH2O	0.04500	0.0500	0.00500	±0.00800	inH2O	Pass	1.61e-004
0.00000 inH2O	0.00000	0.0000	0.00000	±0.00800	inH2O	Pass	1.61e-004

END OF REPORT

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001:2008

Alpha Controls & Instrumentation Inc., Suite 6, 361 Steelcase Road West, Markham, Ontario L3R 3V8 **www.alphacontrols.com** **(800) 567-8686**
data: RUN
Form: ROC101 Rev 7

Appendix C Calibration (page 37 of 60)

Date: 2015-01-26
ID: SBI-246

	Calibration gas	Reading
CO	699 ppm	706 ppm
CO2	0.00%	0.00%
O2	0.00%	0.00%

	Nitrogen	Reading
CO	0 ppm	0 ppm
CO2	0.00%	0.09%
O2	0.00%	0.00%

	Calibration gas	Reading
CO	0 ppm	0 ppm
CO2	19.90%	19.27%
O2	0.00%	0.00%

	Ambient	Reading
CO	0 ppm	0 ppm
CO2	0.00%	0.00%
O2	20.95%	21.02%

Vincent Pelletier

Engineer: Vincent Pelletier

Appendix C Calibration (page 38 of 60)

AIR LIQUIDE

CERTIFICAT D'ANALYSE

MONTREAL SPECIALTY GAS PLANT
11201 RAY LAWSON
MONTREAL QC
H1J 1M6

Client: QUEBEC
2230 BOUL. CHAREST O. STE-FOY
QUEBEC QUEBEC
G1N 2G3 CANADA

Date d'analyse: 12/09/2013
Code de produit: SPG-2MX0017858
Qualité: CERTIFIE
Taille: 7AL
Raccord de sortie du robinet: CGA 350

No de série: S-980185-E
No d`ordre de fabrication: 13-SGM-3197
Pression: 10125 kPa (15°C)
1500 psi (21°C)
Volume: 0,8 m3
Date d'expiration: 12/09/2016

COMPOSANTS	CONCENTRATION NOMINALE	RÉSULTAT D'ANALYSE
MONOXYDE DE CARBONE	700 ppm molaire	699 ppm molaire
AZOTE	BALANCE	BALANCE

Analyse réalisée par:

FREDERIC GAGNON B.Sc.

MÉTHODE D'ANALYSE:
La teneur en CO, NO, NO2 est déterminée par un analyseur infra-rouge non dispersif.

PRÉCISION ANALYTIQUE:
Les spécifications pour les concentrations rapportées sont: +/- 2% pour les constituants en concentration supérieure à 0.5% et +/- 5% pour les constituants en concentration inférieure 0.5%. Sauf indication contraire, la précision d'analyse est indiquée en pourcentage du constituant. Dans certains cas, les valeurs peuvent changer en fonction de la nature, du nombre et de la concentration des constituants du mélange.

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C13-SGM-3197-2
17/09/2013

www.airliquide.ca

2339 (05/02) RE

Appendix C Calibration (page 39 of 60)

AIR LIQUIDE

CERTIFICAT D'ANALYSE

MONTREAL SPECIALTY GAS PLANT
11201 RAY LAWSON
MONTREAL QC
H1J 1M6

Client: QUEBEC
2230 BOUL. CHAREST O. STE-FOY
QUEBEC QUEBEC
G1N 2G3 CANADA

Date d'analyse: 19/09/2013
Code de produit: SPG-2MX0008101
Qualité: CERTIFIE
Taille: 7AL
Raccord de sortie du robinet: CGA 580

No de série: FF-33551
No d`ordre de fabrication: 13-SGM-3199
Pression: 13500 kPa (15°C)
2000 psi (21°C)
Volume: 1,0 m3
Date d'expiration: 19/09/2016

COMPOSANTS	CONCENTRATION NOMINALE	RÉSULTAT D'ANALYSE
DIOXYDE DE CARBONE	20 % molaire	19,9 % molaire
AZOTE	BALANCE	BALANCE

Analyse réalisée par:

FRÉDERIC GAGNON B.Sc.

MÉTHODE D'ANALYSE:
La méthode d'analyse est basée sur le principe de la chromatographie en phase gazeuse comme décrit dans les Instructions d'Opérations de Air Liquide Canada. Selon les besoins,on choisi préférentiellement un détecteur FID ou TCD avec une colonne capillaire ou une colonne remplie.

PRÉCISION ANALYTIQUE:
Les spécifications pour les concentrations rapportées sont: +/- 2% pour les constituants en concentration supérieure à 0.5% et +/- 5% pour les constituants en concentration inférieure 0.5%. Sauf indication contraire, la précision d'analyse est indiquée en pourcentage du constituant. Dans certains cas, les valeurs peuvent changer en fonction de la nature, du nombre et de la concentration des constituants du mélange.

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C13-SGM-3199-1
24/09/2013

www.airliquide.ca

2118 (05/02) RE

Appendix C Calibration (page 40 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T1 (Flue) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.49**	**%**	
	Ave A.D.	0.24	%
Standard	Reading	A.D.	
70.0	70.21	0.30	
70.0	70.13	0.19	
70.0	70.15	0.21	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.06**	**%**	
	Ave A.D.	0.03	%
Standard	Reading	A.D.	
200.0	200.07	0.03	
200.0	199.96	0.02	
200.0	200.21	0.11	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.09**	**%**	
	Ave A.D.	0.04	%
Standard	Reading	A.D.	
600.0	600.28	0.05	
600.0	600.25	0.04	
600.0	600.12	0.02	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.08**	**%**	
	Ave A.D.	0.04	%
Standard	Reading	A.D.	
1000.0	1000.39	0.04	
1000.0	1000.42	0.04	
1000.0	1000.26	0.03	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.07**	**%**	
	Ave A.D.	0.03	%
Standard	Reading	A.D.	
1400.0	1400.48	0.03	
1400.0	1400.47	0.03	
1400.0	1400.44	0.03	

Vincent Pelletier

Appendix C Calibration (page 41 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T2 (ambiant) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.09**	**%**	
	Ave A.D.	0.04	%
Standard	Reading	A.D.	
70.0	70.06	0.09	
70.0	70.00	0.00	
70.0	69.96	0.06	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.05**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
200.0	199.94	0.03	
200.0	200.03	0.02	
200.0	200.11	0.06	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.02**	**%**	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
600.0	600.09	0.02	
600.0	599.99	0.00	
600.0	600.12	0.02	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.07**	**%**	
	Ave A.D.	0.03	%
Standard	Reading	A.D.	
1000.0	1000.27	0.03	
1000.0	1000.42	0.04	
1000.0	1000.43	0.04	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.04**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1400.0	1400.31	0.02	
1400.0	1400.27	0.02	
1400.0	1400.16	0.01	

Vincent Pelletier

Appendix C Calibration (page 42 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T3 (Dilution tunnel) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.19**	**%**	
	Ave A.D.	0.09	%
Standard	Reading	A.D.	
70.0	70.11	0.16	
70.0	69.98	0.03	
70.0	70.05	0.07	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.14**	**%**	
	Ave A.D.	0.07	%
Standard	Reading	A.D.	
200.0	199.86	0.07	
200.0	199.87	0.06	
200.0	199.96	0.02	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.01**	**%**	
	Ave A.D.	0.00	%
Standard	Reading	A.D.	
600.0	599.97	0.00	
600.0	600.03	0.00	
600.0	600.01	0.00	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.03**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1000.0	1000.17	0.02	
1000.0	1000.17	0.02	
1000.0	1000.09	0.01	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.02**	**%**	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
1400.0	1400.18	0.01	
1400.0	1400.12	0.01	
1400.0	1400.15	0.01	

Vincent Pelletier

Appendix C Calibration (page 43 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T4 (Firebox top) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.08**	**%**	
	Ave A.D.	0.04	%
Standard	Reading	A.D.	
70.0	70.02	0.03	
70.0	70.03	0.04	
70.0	69.96	0.06	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.16**	**%**	
	Ave A.D.	0.08	%
Standard	Reading	A.D.	
200.0	199.77	0.11	
200.0	199.92	0.04	
200.0	199.94	0.03	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.01**	**%**	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
600.0	599.94	0.01	
600.0	600.01	0.00	
600.0	599.93	0.01	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.01**	**%**	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
1000.0	1000.06	0.01	
1000.0	1000.05	0.00	
1000.0	1000.12	0.01	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.01**	**%**	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
1400.0	1400.11	0.01	
1400.0	1400.05	0.00	
1400.0	1399.98	0.00	

Vincent Pelletier

Appendix C Calibration (page 44 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T5 (Firebox back) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.33**	**%**	
	Ave A.D.	0.16	%
Standard	Reading	A.D.	
70.0	69.85	0.21	
70.0	69.92	0.11	
70.0	69.91	0.13	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.28**	**%**	
	Ave A.D.	0.14	%
Standard	Reading	A.D.	
200.0	199.72	0.14	
200.0	199.73	0.14	
200.0	199.84	0.08	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.04**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
600.0	599.87	0.02	
600.0	599.92	0.01	
600.0	599.85	0.02	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.01**	**%**	
	Ave A.D.	0.00	%
Standard	Reading	A.D.	
1000.0	1000.03	0.00	
1000.0	999.95	0.00	
1000.0	999.91	0.01	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.01**	**%**	
	Ave A.D.	0.00	%
Standard	Reading	A.D.	
1400.0	1400.03	0.00	
1400.0	1399.96	0.00	
1400.0	1400.12	0.01	

Vincent Pelletier

Appendix C Calibration (page 45 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T6 (Firebox right) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.56**	**%**	
	Ave A.D.	0.28	%
Standard	Reading	A.D.	
70.0	69.76	0.34	
70.0	69.85	0.21	
70.0	69.85	0.21	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.30**	**%**	
	Ave A.D.	0.15	%
Standard	Reading	A.D.	
200.0	199.68	0.16	
200.0	199.72	0.14	
200.0	199.64	0.18	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.07**	**%**	
	Ave A.D.	0.03	%
Standard	Reading	A.D.	
600.0	599.76	0.04	
600.0	599.84	0.03	
600.0	599.77	0.04	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.02**	**%**	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
1000.0	999.93	0.01	
1000.0	1000.14	0.01	
1000.0	1000.02	0.00	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.00**	**%**	
	Ave A.D.	0.00	%
Standard	Reading	A.D.	
1400.0	1399.98	0.00	
1400.0	1400.01	0.00	
1400.0	1399.94	0.00	

Vincent Pelletier

Appendix C Calibration (page 46 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T7 (Firebox left) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.20**	**%**	
	Ave A.D.	0.10	%
Standard	Reading	A.D.	
70.0	69.90	0.14	
70.0	69.96	0.06	
70.0	70.02	0.03	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.31**	**%**	
	Ave A.D.	0.15	%
Standard	Reading	A.D.	
200.0	199.67	0.17	
200.0	199.72	0.14	
200.0	199.54	0.23	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.08**	**%**	
	Ave A.D.	0.04	%
Standard	Reading	A.D.	
600.0	599.79	0.04	
600.0	599.73	0.04	
600.0	599.54	0.08	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.02**	**%**	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
1000.0	999.93	0.01	
1000.0	1000.12	0.01	
1000.0	1000.04	0.00	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.02**	**%**	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
1400.0	1399.88	0.01	
1400.0	1399.89	0.01	
1400.0	1400.02	0.00	

Vincent Pelletier

Appendix C Calibration (page 47 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T8 (Firebox bottom) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.01	%	
R.M.U.	0.01	%	
O.M.U	**0.86**	**%**	
	Ave A.D.	0.43	%
Standard	Reading	A.D.	
70.0	69.68	0.46	
70.0	69.72	0.40	
70.0	69.84	0.23	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.42**	**%**	
	Ave A.D.	0.21	%
Standard	Reading	A.D.	
200.0	199.54	0.23	
200.0	199.63	0.19	
200.0	199.74	0.13	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.12**	**%**	
	Ave A.D.	0.06	%
Standard	Reading	A.D.	
600.0	599.71	0.05	
600.0	599.56	0.07	
600.0	599.72	0.05	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.02**	**%**	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
1000.0	999.82	0.02	
1000.0	999.96	0.00	
1000.0	999.83	0.02	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.04**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1400.0	1399.73	0.02	
1400.0	1399.74	0.02	
1400.0	1399.83	0.01	

Vincent Pelletier

Appendix C Calibration (page 48 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T9 (DGM inlet 1) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.63**	**%**	
	Ave A.D.	0.31	%
Standard	Reading	A.D.	
70.0	69.72	0.40	
70.0	69.84	0.23	
70.0	69.73	0.39	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.38**	**%**	
	Ave A.D.	0.19	%
Standard	Reading	A.D.	
200.0	199.57	0.22	
200.0	199.68	0.16	
200.0	199.72	0.14	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.12**	**%**	
	Ave A.D.	0.06	%
Standard	Reading	A.D.	
600.0	599.67	0.06	
600.0	599.63	0.06	
600.0	599.54	0.08	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.05**	**%**	
	Ave A.D.	0.03	%
Standard	Reading	A.D.	
1000.0	999.78	0.02	
1000.0	999.72	0.03	
1000.0	999.63	0.04	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.05**	**%**	
	Ave A.D.	0.03	%
Standard	Reading	A.D.	
1400.0	1399.54	0.03	
1400.0	1399.74	0.02	
1400.0	1399.63	0.03	

Vincent Pelletier

Appendix C Calibration (page 49 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T10 (DGM outlet 1) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.71**	**%**	
	Ave A.D.	0.36	%
Standard	Reading	A.D.	
70.0	69.72	0.40	
70.0	69.78	0.31	
70.0	69.83	0.24	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.22**	**%**	
	Ave A.D.	0.11	%
Standard	Reading	A.D.	
200.0	199.75	0.13	
200.0	199.82	0.09	
200.0	199.73	0.14	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.11**	**%**	
	Ave A.D.	0.05	%
Standard	Reading	A.D.	
600.0	599.63	0.06	
600.0	599.74	0.04	
600.0	599.74	0.04	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.04**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1000.0	999.78	0.02	
1000.0	999.83	0.02	
1000.0	999.87	0.01	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.03**	**%**	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
1400.0	1399.78	0.02	
1400.0	1399.83	0.01	
1400.0	1399.84	0.01	

Vincent Pelletier

Appendix C Calibration (page 50 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T11 (Probe temperature 1) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.01	%	
R.M.U.	0.01	%	
O.M.U	**1.17**	**%**	
	Ave A.D.	0.59	%
Standard	Reading	A.D.	
70.0	69.55	0.64	
70.0	69.63	0.53	
70.0	69.57	0.61	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.52**	**%**	
	Ave A.D.	0.26	%
Standard	Reading	A.D.	
200.0	199.42	0.29	
200.0	199.54	0.23	
200.0	199.63	0.19	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.13**	**%**	
	Ave A.D.	0.06	%
Standard	Reading	A.D.	
600.0	599.57	0.07	
600.0	599.67	0.06	
600.0	599.54	0.08	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.07**	**%**	
	Ave A.D.	0.03	%
Standard	Reading	A.D.	
1000.0	999.66	0.03	
1000.0	999.65	0.04	
1000.0	999.72	0.03	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.04**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1400.0	1399.66	0.02	
1400.0	1399.72	0.02	
1400.0	1399.64	0.03	

Vincent Pelletier

Appendix C Calibration (page 51 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T12 (DGM inlet 2) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.01	%	
R.M.U.	0.01	%	
O.M.U	**0.93**	**%**	
	Ave A.D.	0.46	%
Standard	Reading	A.D.	
70.0	69.63	0.53	
70.0	69.72	0.40	
70.0	69.73	0.39	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.43**	**%**	
	Ave A.D.	0.22	%
Standard	Reading	A.D.	
200.0	199.57	0.22	
200.0	199.57	0.22	
200.0	199.54	0.23	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.08**	**%**	
	Ave A.D.	0.04	%
Standard	Reading	A.D.	
600.0	599.87	0.02	
600.0	599.67	0.06	
600.0	599.72	0.05	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.05**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1000.0	999.78	0.02	
1000.0	999.75	0.03	
1000.0	599.83	40.02	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.02**	**%**	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
1400.0	1399.87	0.01	
1400.0	1399.92	0.01	
1400.0	1399.95	0.00	

Vincent Pelletier

Appendix C Calibration (page 52 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T13 (DGM outlet 2) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.17**	**%**	
	Ave A.D.	0.09	%
Standard	Reading	A.D.	
70.0	69.89	0.16	
70.0	70.01	0.01	
70.0	70.03	0.04	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.20**	**%**	
	Ave A.D.	0.10	%
Standard	Reading	A.D.	
200.0	199.78	0.11	
200.0	199.83	0.08	
200.0	199.75	0.13	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.07**	**%**	
	Ave A.D.	0.03	%
Standard	Reading	A.D.	
600.0	599.82	0.03	
600.0	599.76	0.04	
600.0	599.73	0.04	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.03**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1000.0	999.95	0.00	
1000.0	999.74	0.03	
1000.0	999.83	0.02	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.00**	**%**	
	Ave A.D.	0.00	%
Standard	Reading	A.D.	
1400.0	1400.02	0.00	
1400.0	1399.97	0.00	
1400.0	1400.12	0.01	

Vincent Pelletier

Appendix C Calibration (page 53 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T14 (Probe temperature 2) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.01	%	
R.M.U.	0.01	%	
O.M.U	**1.23**	**%**	
	Ave A.D.	0.61	%
Standard	Reading	A.D.	
70.0	69.60	0.57	
70.0	69.54	0.66	
70.0	69.61	0.56	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.48**	**%**	
	Ave A.D.	0.24	%
Standard	Reading	A.D.	
200.0	199.51	0.25	
200.0	199.54	0.23	
200.0	199.72	0.14	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.10**	**%**	
	Ave A.D.	0.05	%
Standard	Reading	A.D.	
600.0	599.69	0.05	
600.0	599.72	0.05	
600.0	599.64	0.06	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.05**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1000.0	999.78	0.02	
1000.0	999.74	0.03	
1000.0	999.85	0.01	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.04**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1400.0	1399.73	0.02	
1400.0	1399.75	0.02	
1400.0	1399.82	0.01	

Vincent Pelletier

Appendix C Calibration (page 54 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T15 (Duct Inlet) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.01	%	
R.M.U.	0.01	%	
O.M.U	**1.23**	**%**	
	Ave A.D.	0.61	%
Standard	Reading	A.D.	
70.0	69.74	0.57	
70.0	69.84	0.66	
70.0	69.82	0.56	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.48**	**%**	
	Ave A.D.	0.24	%
Standard	Reading	A.D.	
200.0	199.69	0.25	
200.0	199.69	0.23	
200.0	199.75	0.14	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.10**	**%**	
	Ave A.D.	0.05	%
Standard	Reading	A.D.	
600.0	599.81	0.05	
600.0	599.82	0.05	
600.0	599.87	0.06	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.05**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1000.0	999.92	0.02	
1000.0	999.96	0.03	
1000.0	999.84	0.01	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.04**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1400.0	1399.88	0.02	
1400.0	1399.87	0.02	
1400.0	1399.82	0.01	

Vincent Pelletier

Appendix C Calibration (page 55 of 60)

Date: 2015-01-20

Equipment: Test bench #4
T15 (Duct Inlet) Temperature: 68 F
Accuracy: 0.01 R.H.: 18%
Reference: SBI-096

S.D.	0.01	%	
R.M.U.	0.01	%	
O.M.U	**1.23**	**%**	
	Ave A.D.	0.61	%
Standard	Reading	A.D.	
70.0	69.74	0.57	
70.0	69.84	0.66	
70.0	69.82	0.56	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**0.48**	**%**	
	Ave A.D.	0.24	%
Standard	Reading	A.D.	
200.0	199.69	0.25	
200.0	199.69	0.23	
200.0	199.75	0.14	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.10**	**%**	
	Ave A.D.	0.05	%
Standard	Reading	A.D.	
600.0	599.81	0.05	
600.0	599.82	0.05	
600.0	599.87	0.06	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.05**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1000.0	999.92	0.02	
1000.0	999.96	0.03	
1000.0	999.84	0.01	

S.D.	0.00	%	
R.M.U.	0.00	%	
O.M.U	**0.04**	**%**	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1400.0	1399.88	0.02	
1400.0	1399.87	0.02	
1400.0	1399.82	0.01	

Vincent Pelletier

Appendix C Calibration (page 56 of 60)

Rapport d'étalonnage No. ca0003-219-031114
Mettler Toledo
Service Business Unit Industrial
1900 Polaris Parkway
Columbus, Ohio 43240
1-800-METTLER

Accrédité par l'American Association for Laboratory Accreditation (A2LA)
CERT.CALIBRATION #1902.02

METTLER TOLEDO

ISO 9001 Registered
ANSI/NCSL Z540-1 Accrédité

Certificat d'étalonnage

Client

Société :	SBI Fabricant De Poeles		
Adresse :	250 Rue de Copenhague		
Ville :	Saint-Augustin-De-Desmaures	*État/Province :*	Quebec
Code postal :	G3A 2H3	Astea Customer ID:	300276257

Instrument

Constructeur :	Weigh-Tronix	*Modèle de terminal :*	IND560
Modèle :	DSL4848	*# série du terminal:*	00927386KL
No de série :	B00927386KL	*# série de l'imprimant*	N/A
Capacité :	500 kg		BANC #4
Résolution :	0,02 kg	*Nbre de Divisions:*	25000
Classe :	III	*Procédure utilisée :*	NIST Handbook 44
No./ID d'inventaire:	SBI-014		
Procédure:	Le présent certificat est émis conformément aux conditions de certification accordées par l'A2LA, en vertu de la norme ISO/IEC 17025. A2LA a évalué la capacité de mesure du laboratoire et la traçabilité des normes nationales reconnues.		

Date de calibrage :	11-mars-2014	*Date, prochaine Cal.*	31-mars-2015
Signataire autorisé (A2LA) :	Dany Careau	*Signature:*	ELECTRONIC SIGNATURE

Étalons de travail

Retracabilité: Les poids de test utilisés se réfèrent au National Institute of Standards and Technology.

Jeu de poids no :	*Traçabilité NIST No.:*	*Classe ASTM/OIML*	*Date d'étalonnage :*	*Date proch. étalonnage*
TB2	M13-0254	M1	14-août-2013	14-août-2014
Série Q	1401320	M1	30-déc-2013	30-déc-2014
MTP4	MT0032333	F1	6-juin-2013	5-juin-2014

Version Logiciel : 4.5.5.2

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Appendix C Calibration (page 57 of 60)

Rapport d'étalonnage No. ca0003-219-031114

METTLER TOLEDO

Résultats de mesure

La température : 70 °F

Les conditions ambiantes ont été vérifiées afin d'assurer l'exactitude de l'étalonnage.

Test de variation

□ 1	2 □
□ 4	3 □

		Avant Réglage	*Après Réglage*
Poids Appliqués	*Position*	*Valeur lue*	*Valeur lue*
1: 100 kg	*Position 1*	99,96 kg	100,00 kg
2: 100 kg	*Position 2*	99,98 kg	100,00 kg
3: 100 kg	*Position 3*	100,00 kg	100,00 kg
4: 100 kg	*Position 4*	100,04 kg	100,00 kg
Erreur maximum :		0,08 kg	0,00 kg
Max Erreur Admissible :		0,10 kg	0,1 kg

Linéarité

	Avant réglage					
	Poids Appliqués	*Valeur lue*	*Erreur*		*Erreur admissible*	*Dans la Tolérance*
Zero 1,00	0,00 kg	0,00 kg	0,00 kg	0 d	1 d	OUI
2,00	40,00 kg	40,00 kg	0,00 kg	0 d	2 d	OUI
3,00	80,00 kg	80,00 kg	0,00 kg	0 d	3 d	OUI
4,00	120,00 kg	120,00 kg	0,00 kg	0 d	5 d	OUI
5,00	160,00 kg	160,00 kg	0,00 kg	0 d	5 d	OUI
Max 6,00	200,00 kg	200,00 kg	0,00 kg	0 d	5 d	OUI

□ Méthode de substitution utilisée

Version Logiciel : 4.5.5.2

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Appendix C Calibration (page 58 of 60)

Rapport d'étalonnage No. ca0003-219-031114

METTLER TOLEDO

	Après réglage					
	Poids Appliqués	*Valeur lue*	*Erreur*		*Erreur admissible*	*Dans la Tolérance*
Zero 1,00	0,00 kg	0,00 kg	0,00 kg	0 d	1 d	OUI
2,00	40,00 kg	40,00 kg	0,00 kg	0 d	2 d	OUI
3,00	80,00 kg	80,00 kg	0,00 kg	0 d	3 d	OUI
4,00	120,00 kg	120,00 kg	0,00 kg	0 d	5 d	OUI
5,00	160,00 kg	160,00 kg	0,00 kg	0 d	5 d	OUI
Max 6,00	200,00 kg	200,00 kg	0,00 kg	0 d	5 d	OUI

☐ Méthode de substitution utilisée

Un réglage de la balance a été requis
Si non, les résultats "avant réglage" correspondent aux résultats tel que laissé.

☑ **OUI** ☐ **NON**

Répétabilité

Poids appliqués : 100,00 kg

	Chargé	*Vide*	*Différence*
1	100,00 kg	0,00 kg	100 kg
2	100,00 kg	0,00 kg	100 kg
3	100,00 kg	0,00 kg	100 kg
	Erreur maximale :	0,00 kg	0,0 d
	Tolérance :	0,10 kg	5 d

Incertitude

Mesure de l'incertitude = 0,012 kg

L'incertitude de mesure représente les incertitudes étendues selon un facteur de sécurité K=2 générant un niveau de confiance approximatif de 95 %. Des dispositions doivent être prises en matière d'environnement au lieu d'étalonnage, d'incertitude induite par l'article en étalonnage et d'effets indésirables causés par le transport du matériel d'étalonnage. Ces facteurs pourraient entraîner une incertitude plus grande que le CMC.

Remarques

TR-ca0003 - CalibrationDate Ancienne valeur = `10-03-14` Nouvelle valeur = `11-03-14`11-mars-14 11:41:45

Version Logiciel : 4.5.5.2

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Appendix C Calibration (page 59 of 60)

alpha CONTROLS & INSTRUMENTATION

Report of Calibration
As Found / As Left

ilac-MRA ACCREDITED CALIBRATION CERT #2260.01

Procedure: Low Pressure: CAL VER /Ruska 7250LP: Revision: 1.2.A **Page 1 of 2**

UUT

Made by:	Dwyer
Model:	0-0.20INH2O
Serial No.:	N/A
ID No.:	SBI-023
Description:	Pressure Gauge

Customer

STOVE BUILDER INTERNATIONAL INC.
250 RUE DE COPENHAGUE
ST-AUSTIN-DE-DESMAURES, QC
G3A 2H3

Calibration

Report No.:	AC14021257-SBI-023
Adjusted:	No
Condition:	As Tested
Calibration Date:	14-Feb-2014
Calibration Due:	14-Feb-2015

Environment

Temperature:	22.7ºC
Humidity:	20%RH

STATEMENT OF UNCERTAINTY: The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor K = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2005 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

This report shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

STANDARDS

Instrument	Model	ID No./Serial No.	Traceability No.	Recall Date
Low Pressure Calibrator	Ruska 7250LP	PRE-CAL-06	1500153193/1500153194	29-Aug-2014

REMARKS:

Calibrated in vertical position.
Unit is not adjustable.

Performed by: Alex Radomishelsky

Reviewed by: Slava Peciurov

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001:2008

Alpha Controls & Instrumentation Inc., Suite 6, 361 Steelcase Road West, Markham, Ontario L3R 3V8 www.alphacontrols.com (800) 567-8686

Form: ROC101 Rev 7 *data: RUN*

Appendix C Calibration (page 60 of 60)

Report of Calibration
As Found / As Left

ACCREDITED CALIBRATION CERT #2260.01

Procedure: Low Pressure: CAL VER /Ruska 7250LP: Revision: 1.2.A **Page 2 of 2**

UUT
Made by: Dwyer
Model: 0-0.20INH2O
Serial No.: N/A
ID No.: SBI-023
Description: Pressure Gauge

Calibration
Report No.: AC14021257-SBI-023
Adjusted: No
Condition: As Tested
Calibration Date: 14-Feb-2014
Calibration Due: 14-Feb-2015

Test Description	STD	UUT	Error	Units	Uncertainty
LOW PRESSURE TEST					
0.0000 inH2O	0.0000	0.000	0.00000	inH2O	5.97e-004
0.0520 inH2O	0.0520	0.050	-0.00200	inH2O	5.97e-004
0.1050 inH2O	0.1050	0.100	-0.00500	inH2O	5.97e-004
0.1580 inH2O	0.1580	0.150	-0.00800	inH2O	5.97e-004
0.2200 inH2O	0.2200	0.200	-0.02000	inH2O	5.97e-004
0.1540 inH2O	0.1540	0.150	-0.00400	inH2O	5.97e-004
0.1000 inH2O	0.1000	0.100	0.00000	inH2O	5.97e-004
0.0490 inH2O	0.0490	0.050	0.00100	inH2O	5.97e-004
0.0000 inH2O	0.0000	0.000	0.00000	inH2O	5.97e-004

END OF REPORT

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001:2008

Alpha Controls & Instrumentation Inc., Suite 6, 361 Steelcase Road West, Markham, Ontario L3R 3V8 www.alphacontrols.com (800) 567-8686

Form: ROC101 Rev 7 *data: RUN*

Appendix E Dry Gas meter calibration

Intertek

Page 1 of 1

Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	98Z332226

Previous Calibration Comparision

Date	2014-05-05	Acceptable	
		Deviation (5%)	Deviation
y Factor	0.993	0.04965	0.005
Acceptance	Acceptable		

Average Gas Meter y Factor	**0.998**
Calibration Date:	02-06-15
Calibrated by:	Vincent Pelletier
Calibration Frequency:	6-months
Next Calibration Due:	07-23-15
Instrument Range:	1.000 cfm
Standard Temp.:	77 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	29.93 "Hg
Signature/Date:	Vincent Pelletier 2015-02-06

Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.001
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	09-sept-14	
	Calib. Value	0.9930	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	191.671	196.637	201.612
Final Reference Meter	196.637	201.612	210.829
Initial DGM	883.743	888.693	893.638
Final DGM	888.693	893.638	902.806
Temp. Ref. Meter (°F), Tr	66.0	66.6	66.8
Temperature DGM (°F), Td	66.2	66.6	66.4
Time (Minutes)	34.2	34.5	64.0
Net Volume Ref. Meter, Vr	4.966	4.975	9.217
Net Volume DGM, Vd	4.95	4.945	9.168
Gas Meter y Factor =	**0.997**	**0.999**	**0.998**
Gas Meter y Factor Deviation (from avg.)	0.001	0.001	0.000
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.144736842

1. Deviation = |Average value for all runs - current run value|
2. y = [Vr x (y factor (ref)) x (Pb) x (Td + 460) / [Vd x (Pb + (dH / 13.6)) x (Tr + 460]
3. dH@ = 0.0317 x dH / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272

SBI-046_02-2015 - PT

Appendix E Dry Gas meter calibration (page 2 of 2)

Intertek

Page 1 of 1

Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	90R054300

Previous Calibration Comparision

Date	2014-05-05	Acceptable	
		Deviation (5%)	Deviation
y Factor	0.998	0.0499	0.005
Acceptance	Acceptable		

Average Gas Meter y Factor	**0.993**
Calibration Date:	02-06-15
Calibrated by:	Vincent Pelletier
Calibration Frequency:	6-months
Next Calibration Due:	July 23rd, 2015
Instrument Range:	1.000 cfm
Standard Temp.:	76 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	29.93 "Hg
Signature/Date:	Vincent Pelletier 2015-02-02

Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.001
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	09-sept-14	
	Calib. Value	0.9930	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	191.671	196.637	201.612
Final Reference Meter	196.637	201.612	210.829
Initial DGM	209.000	214.000	219.000
Final DGM	214.000	219.000	228.266
Temp. Ref. Meter (°F), Tr	66.0	66.6	66.8
Temperature DGM (°F), Td	69.0	69.8	70.2
Time (Minutes)	34.2	34.5	64.0
Net Volume Ref. Meter, Vr	4.966	4.975	9.217
Net Volume DGM, Vd	5	5	9.266
Gas Meter y Factor =	**0.992**	**0.994**	**0.994**
Gas Meter y Factor Deviation (from avg.)	0.001	0.001	0.001
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.14619883

1. Deviation = |Average value for all runs - current run value|
2. y = [Vr x (y factor (ref)) x (Pb) x (Td + 460) / [Vd x (Pb + (dH / 13.6)) x (Tr + 460]
3. dH@ = 0.0317 x dH / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272

SBI-047_02-2015 - PT

Appendix F 10 hours break-in period

APPENDIX F

10 Hours Break-in Period

Appendix F 10 hours break-in period (page 2 of 35)

January 7th, 2015

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	scale
1	325.3	66.0	138.2	100.2	405.6	331.4	368.2	408.2	315.8	66.0	28.0
2	340.2	66.2	141.9	100.4	400.7	329.3	362.3	409.1	315.1	66.2	33.2
3	384.5	65.4	140.3	101.2	413.8	328.0	355.9	410.1	314.3	65.4	32.8
4	453.5	65.6	146.1	105.2	462.0	326.2	349.6	411.1	313.7	65.6	32.3
5	497.1	65.5	153.1	109.3	525.5	324.5	343.4	411.9	313.3	65.5	31.7
6	522.8	65.6	159.7	113.1	589.4	322.8	337.9	412.5	312.5	65.6	31.2
7	536.4	65.8	165.6	116.8	646.8	321.0	332.5	412.9	311.9	65.8	30.7
8	548.3	65.5	170.6	119.7	697.5	319.2	327.5	413.0	311.3	65.5	30.1
9	559.8	66.0	176.6	122.7	741.0	317.7	323.1	413.0	310.7	66.0	29.6
10	567.5	66.0	179.6	124.4	777.8	316.3	318.7	412.8	309.7	66.0	29.2
11	571.0	65.9	183.1	122.6	802.3	311.6	310.4	412.4	305.1	65.9	28.8
12	572.3	67.0	185.9	122.7	821.1	306.8	302.9	411.8	301.2	67.0	28.3
13	572.6	66.5	188.0	122.5	835.5	302.5	296.3	411.0	297.9	66.5	27.9
14	572.6	66.5	189.6	122.5	846.6	298.7	290.8	409.9	295.0	66.5	27.4
15	572.4	68.2	190.3	122.9	854.5	295.7	286.0	408.8	292.7	68.2	27.0
16	571.5	66.8	190.9	123.4	860.3	293.4	282.1	407.3	290.9	66.8	26.6
17	570.9	67.0	191.3	123.3	863.5	291.4	278.8	405.8	289.3	67.0	26.2
18	568.4	66.8	191.3	123.2	866.2	289.7	276.1	404.1	288.5	66.8	25.8
19	566.8	66.2	191.2	122.8	867.3	288.4	273.6	402.4	287.3	66.2	25.5
20	565.5	69.3	191.1	123.2	867.6	287.6	271.8	400.7	286.5	69.3	25.1
21	562.9	66.9	190.8	122.9	868.7	286.9	270.3	398.8	286.0	66.9	24.7
22	561.3	68.0	190.8	122.8	868.1	286.3	269.0	397.0	285.6	68.0	24.3
23	556.2	66.7	189.9	121.9	866.7	285.8	267.9	395.1	285.7	66.7	24.0
24	553.3	66.9	188.8	121.5	864.4	285.5	266.9	393.3	285.5	66.9	23.6
25	550.0	67.5	188.3	120.9	860.5	285.5	265.9	391.4	285.2	67.5	23.3
26	546.9	68.0	187.6	121.1	855.7	285.7	265.4	389.6	285.3	68.0	22.9
27	543.2	67.8	186.7	120.7	850.3	286.0	264.7	387.7	285.4	67.8	22.6
28	539.7	66.7	185.0	120.0	842.6	286.2	264.1	385.8	285.7	66.7	22.2
29	536.6	67.4	183.4	119.6	834.4	286.7	263.4	384.1	286.0	67.4	21.9
30	532.5	68.8	183.0	119.9	826.5	287.2	263.7	382.2	286.4	68.8	21.6

Appendix F 10 hours break-in period (page 3 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	scale
31	529.7	67.2	180.9	119.2	818.1	287.9	263.6	380.5	286.6	67.2	21.3
32	525.3	66.6	179.7	118.9	810.9	289.2	264.4	378.7	287.7	66.6	21.0
33	522.9	66.6	178.9	118.6	802.9	290.5	265.2	377.0	288.6	66.6	20.7
34	520.3	66.2	177.7	118.2	794.6	291.6	265.8	375.3	289.5	66.2	20.4
35	517.6	68.2	176.8	118.5	786.1	292.6	266.2	373.7	290.2	68.2	20.1
36	515.6	66.8	175.6	117.8	777.4	293.4	266.6	372.1	291.0	66.8	19.8
37	513.8	66.2	175.0	120.6	773.5	297.7	270.3	370.6	295.6	66.2	19.6
38	513.8	66.1	174.5	121.4	771.1	301.8	274.0	369.1	299.4	66.1	19.3
39	513.2	66.3	174.8	121.6	769.3	305.3	277.0	367.8	302.5	66.3	19.1
40	512.1	66.9	174.2	118.7	761.0	305.0	275.8	366.4	301.3	66.9	18.7
41	509.5	67.0	173.2	117.8	752.1	304.4	275.1	365.2	300.3	67.0	18.4
42	507.2	66.4	172.4	120.3	748.4	307.6	278.5	364.0	303.6	66.4	18.2
43	506.4	66.1	171.7	120.9	745.4	310.9	282.0	362.8	306.5	66.1	18.0
44	505.5	66.1	171.6	121.1	741.7	313.4	284.7	361.7	309.0	66.1	17.7
45	504.9	67.2	171.2	121.8	738.1	315.8	287.0	360.6	311.1	67.2	17.5
46	503.6	66.2	170.9	121.8	734.2	317.9	289.2	359.5	313.5	66.2	17.2
47	504.0	66.4	169.4	121.9	730.8	319.9	291.3	358.6	315.5	66.4	16.9
48	503.9	66.4	168.6	121.9	727.9	321.5	293.2	357.7	317.4	66.4	16.7
49	504.4	65.3	169.5	121.3	725.9	323.1	294.7	356.8	319.3	65.3	16.4
50	501.8	66.4	168.5	121.7	722.7	324.3	296.3	356.0	320.7	66.4	16.2
51	497.4	66.2	167.9	121.3	716.6	325.6	297.7	355.1	322.1	66.2	15.9
52	494.8	66.2	166.6	121.1	708.5	326.5	299.2	354.3	323.4	66.2	15.7
53	492.4	66.1	165.7	120.7	701.5	327.6	300.5	353.5	324.3	66.1	15.5
54	490.6	66.0	165.2	120.1	694.8	328.3	301.7	352.8	325.6	66.0	15.2
55	488.9	66.2	164.7	119.9	688.3	328.8	303.1	352.1	326.7	66.2	15.0
56	486.2	66.1	163.4	119.7	681.9	329.6	304.2	351.3	328.0	66.1	14.8
57	484.3	66.2	163.0	119.4	677.0	330.3	305.5	350.7	328.9	66.2	14.5
58	481.3	66.0	161.7	119.1	673.3	330.7	306.5	350.1	330.0	66.0	14.3
59	479.2	66.1	160.9	118.5	669.1	330.9	307.5	349.4	331.2	66.1	14.1
60	475.0	66.4	160.1	118.0	664.3	331.2	308.5	348.9	332.5	66.4	13.9
61	474.1	66.0	159.1	118.1	659.1	331.4	309.2	348.3	333.7	66.0	13.7
62	472.0	66.0	158.5	117.3	654.4	331.3	310.2	347.7	334.6	66.0	13.4

Appendix F 10 hours break-in period (page 4 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	scale
63	468.2	65.9	157.9	116.9	649.9	331.4	310.9	347.2	335.5	65.9	13.3
64	465.7	65.7	156.5	116.4	645.1	331.5	311.8	346.7	336.5	65.7	13.1
65	461.9	66.2	155.3	116.0	639.9	331.4	312.4	346.1	337.5	66.2	12.9
66	459.1	65.6	154.6	115.7	635.2	331.6	312.9	345.5	338.1	65.6	12.7
67	456.1	65.9	153.5	115.2	630.3	331.1	313.6	345.1	338.9	65.9	12.4
68	453.8	66.2	153.0	114.8	625.7	331.0	314.3	344.6	339.6	66.2	12.2
69	452.7	65.2	152.1	113.8	621.3	330.4	314.9	344.1	340.4	65.2	12.0
70	449.9	66.0	150.7	113.9	618.3	330.2	315.5	343.7	340.6	66.0	11.9
71	446.8	65.7	150.2	113.5	615.1	329.7	316.1	343.2	341.3	65.7	11.7
72	447.6	66.2	149.7	113.4	611.0	329.4	316.6	342.8	341.9	66.2	11.5
73	445.6	66.0	148.6	113.1	606.5	329.0	317.4	342.4	342.6	66.0	11.3
74	444.6	65.6	148.0	112.7	601.9	328.3	317.8	342.0	342.9	65.6	11.2
75	441.7	66.3	147.5	112.9	597.2	328.0	318.5	341.6	343.6	66.3	11.0
76	438.9	66.1	146.5	112.4	592.5	327.4	319.1	341.2	344.1	66.1	10.9
77	436.9	66.2	145.9	112.4	587.9	326.9	319.6	340.9	344.8	66.2	10.7
78	435.9	66.1	145.4	112.1	583.2	326.3	320.0	340.6	345.2	66.1	10.5
79	433.5	65.3	145.0	111.2	579.4	325.7	320.2	340.3	345.7	65.3	10.4
80	432.6	66.1	144.3	111.2	575.2	324.9	320.3	340.0	346.1	66.1	10.3
81	431.0	66.0	143.8	111.1	571.3	324.3	321.0	339.7	346.6	66.0	10.1
82	428.9	66.1	142.9	110.8	567.8	323.6	321.0	339.4	346.8	66.1	9.9
83	427.6	65.8	142.3	110.5	564.6	323.0	321.2	339.1	347.2	65.8	9.8
84	424.1	65.8	141.9	110.0	561.0	322.5	321.6	339.0	347.6	65.8	9.6
85	422.2	66.2	141.1	110.2	557.6	321.9	321.8	338.8	348.0	66.2	9.5
86	418.8	66.5	140.5	109.9	553.5	321.3	322.2	338.6	348.3	66.5	9.4
87	417.0	66.2	139.1	109.4	549.3	320.7	322.4	338.4	349.0	66.2	9.2
88	414.7	65.8	138.1	108.9	545.5	320.0	322.8	338.2	349.4	65.8	9.1
89	413.5	65.1	138.1	108.0	541.8	319.2	322.9	338.1	349.7	65.1	8.9
90	411.8	66.1	137.3	108.2	538.5	318.5	323.3	338.0	349.8	66.1	8.8
91	410.6	66.0	136.6	107.8	536.0	318.0	323.8	337.9	350.1	66.0	8.7
92	409.4	65.8	136.0	107.6	533.8	317.2	324.3	337.8	350.1	65.8	8.5
93	409.9	65.4	136.1	107.2	531.9	316.6	324.5	337.7	349.9	65.4	8.4
94	409.8	65.1	135.2	106.6	530.3	316.2	324.7	337.6	350.5	65.1	8.3

Appendix F 10 hours break-in period (page 5 of 35)

Elapsed	Flue	Room	Tunnel	Degrees F						inlet	
Time	temp	temp	dry bulb	Outlet air	top	back	right	left	bottom	air	scale
95	408.2	66.0	135.1	106.9	528.5	315.7	325.4	337.5	350.7	66.0	8.2
96	407.1	66.0	134.7	106.8	526.6	314.9	325.7	337.4	350.9	66.0	8.0
97	405.8	66.0	134.3	106.8	524.9	314.8	326.3	337.3	351.1	66.0	7.9
98	404.0	64.8	133.8	106.0	523.1	314.5	327.1	337.2	351.2	64.8	7.8
99	403.3	65.0	133.7	105.6	521.5	314.1	327.7	337.2	351.2	65.0	7.6
100	401.9	66.0	133.4	106.1	519.9	313.9	328.5	337.2	351.1	66.0	7.5
101	399.6	65.7	132.8	105.9	517.7	313.5	329.2	337.1	351.2	65.7	7.4
102	397.8	65.9	132.2	105.7	516.2	313.4	330.1	337.2	351.4	65.9	7.3
103	394.7	65.2	131.4	105.2	514.2	313.0	331.1	337.3	351.3	65.2	7.1
104	390.8	64.8	130.4	104.5	511.5	312.8	332.9	337.3	351.8	64.8	7.0
105	387.6	66.0	129.5	104.6	508.0	312.7	336.3	337.3	351.5	66.0	7.0
106	384.4	65.8	128.6	104.3	504.2	312.5	339.2	337.4	351.2	65.8	6.8
107	381.7	65.9	127.7	104.0	500.1	312.3	342.1	337.4	351.1	65.9	6.7
108	379.6	64.9	127.2	103.2	495.8	312.0	344.3	337.4	350.4	64.9	6.6
109	377.4	64.9	126.4	102.6	491.6	311.8	346.1	337.4	349.9	64.9	6.5
110	375.0	65.8	125.6	102.8	487.4	311.4	347.9	337.3	349.0	65.8	6.4
111	372.6	65.9	125.3	102.7	483.1	311.2	349.8	337.3	348.1	65.9	6.3
112	370.8	66.0	124.6	102.4	479.0	310.8	351.3	337.4	346.9	66.0	6.2
113	368.9	65.1	123.8	101.6	474.8	310.3	352.6	337.3	345.9	65.1	6.1
114	367.1	64.8	123.5	100.9	471.1	309.7	353.1	337.2	344.7	64.8	6.1
115	365.0	65.9	122.8	101.4	467.2	309.3	354.1	337.2	343.3	65.9	6.0
116	362.9	65.6	122.4	101.0	463.5	308.7	354.6	337.1	341.9	65.6	5.9
117	361.0	65.7	121.7	100.6	459.8	308.4	355.2	337.0	340.6	65.7	5.8
118	359.9	64.6	121.4	99.9	456.4	307.6	355.7	337.0	339.2	64.6	5.7
119	358.5	64.6	121.2	99.7	453.2	307.3	356.0	336.9	337.7	64.6	5.6
120	356.4	65.8	120.5	99.9	449.6	306.7	356.2	336.8	336.0	65.8	5.5
121	354.2	65.7	120.1	99.7	446.3	306.0	356.5	336.6	334.5	65.7	5.4
122	352.6	65.6	119.5	99.4	442.7	305.4	356.1	336.6	332.6	65.6	5.4
123	351.0	64.6	119.0	98.8	439.3	304.4	356.0	336.5	331.0	64.6	5.3
124	349.6	64.6	118.6	98.6	436.1	303.5	355.9	336.5	329.4	64.6	5.2
125	348.3	65.3	118.5	98.3	432.7	302.5	355.2	336.3	327.5	65.3	5.1
126	347.1	64.8	118.1	98.0	430.1	301.6	355.0	336.3	326.0	64.8	5.0

Appendix F 10 hours break-in period (page 6 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	scale
127	346.0	65.2	117.7	98.0	427.2	300.8	354.4	336.2	324.2	65.2	5.0
128	344.9	64.6	117.5	97.4	424.3	299.7	354.0	336.1	322.5	64.6	4.9
129	343.8	65.0	117.1	97.2	421.6	298.8	353.1	335.9	320.8	65.0	4.8
130	342.1	65.9	116.5	97.6	419.1	297.7	352.6	335.9	319.3	65.9	4.8
131	340.9	65.8	116.4	97.6	416.3	296.7	352.6	335.8	318.0	65.8	4.7
132	339.7	65.7	115.8	97.5	414.1	295.9	352.0	335.7	316.5	65.7	4.6
133	338.9	64.7	115.6	96.7	411.7	294.7	350.8	335.7	314.9	64.7	4.5
134	338.0	65.7	115.4	96.6	409.5	293.5	349.6	335.6	313.3	65.7	4.4
135	336.5	66.2	115.1	96.8	407.2	292.4	348.6	335.5	311.7	66.2	4.4
136	334.9	66.0	114.7	96.8	404.7	291.4	347.3	335.4	310.3	66.0	4.3
137	334.2	65.9	114.6	96.5	402.7	290.5	346.2	335.3	308.8	65.9	4.2
138	333.1	65.5	114.2	96.4	400.4	289.4	345.0	335.3	307.5	65.5	4.1
139	332.3	65.7	114.0	96.2	398.4	288.3	344.0	335.2	306.1	65.7	4.1
140	331.1	66.2	113.7	96.3	396.4	287.1	343.0	335.1	304.9	66.2	4.0
141	329.8	66.1	113.2	96.1	394.3	286.0	341.9	335.0	303.3	66.1	3.9
142	329.4	66.4	113.1	95.8	392.3	284.7	340.6	335.0	301.9	66.4	3.9
143	328.6	66.0	112.9	95.6	390.3	283.4	339.5	335.0	300.4	66.0	3.8
144	327.7	66.9	112.8	95.7	388.4	282.5	338.0	334.9	299.1	66.9	3.7
145	326.7	66.2	112.5	95.6	386.7	281.5	337.0	334.8	297.7	66.2	3.6
146	325.6	66.0	112.4	95.2	384.9	280.3	336.0	334.8	296.3	66.0	3.6
147	324.2	65.8	112.2	95.1	383.0	279.3	334.7	334.7	295.0	65.8	3.5
148	323.6	65.6	111.8	94.9	381.2	278.2	333.8	334.7	293.6	65.6	3.4
149	322.8	67.0	111.6	94.9	379.3	277.0	332.9	334.6	292.3	67.0	3.4
150	320.6	66.1	111.4	94.8	377.4	276.1	332.0	334.6	291.3	66.1	3.3
151	319.7	65.9	110.9	94.3	375.4	275.0	330.2	334.6	289.7	65.9	3.3
152	318.4	65.9	110.8	94.3	373.3	274.2	328.0	334.7	288.7	65.9	3.2
153	316.7	64.9	110.6	93.6	371.3	273.2	325.5	334.6	287.5	64.9	3.1
154	315.0	65.4	110.2	93.2	369.1	272.1	323.0	334.6	286.0	65.4	3.1
155	313.9	66.2	110.0	93.5	367.1	271.1	320.6	334.6	284.5	66.2	3.0
156	312.5	66.5	109.6	93.4	365.1	270.3	318.2	334.6	283.3	66.5	3.0
157	312.8	65.9	109.4	101.1	369.2	277.2	327.2	334.6	291.5	65.9	3.0
158	318.4	65.5	109.9	111.8	381.6	291.5	343.5	334.7	305.6	65.5	2.4

Appendix F 10 hours break-in period (page 7 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	scale
159	321.2	64.5	109.5	97.5	379.5	287.9	335.7	335.0	299.9	64.5	2.4
160	319.5	65.8	109.6	96.5	375.8	284.0	328.5	335.5	295.7	65.8	2.5
161	316.9	65.7	109.4	95.7	372.5	281.0	323.2	336.0	292.5	65.7	2.6
162	314.2	65.9	109.2	95.1	369.3	278.3	318.9	336.3	289.5	65.9	2.6
163	311.5	65.4	109.1	94.4	366.1	275.8	315.2	336.5	286.8	65.4	2.5
164	309.7	65.3	108.6	93.3	362.8	273.4	311.8	336.6	284.3	65.3	2.5
165	307.9	65.7	108.3	93.4	359.7	271.3	308.9	336.8	282.1	65.7	2.4
166	308.2	65.6	108.2	102.5	364.7	279.3	319.5	336.7	291.7	65.6	2.4
167	313.3	65.4	108.5	112.1	375.7	292.1	334.4	336.8	304.2	65.4	1.9
168	315.9	64.8	108.4	97.8	372.7	287.9	326.7	337.2	298.1	64.8	1.9
169	313.7	65.0	108.4	95.9	368.1	283.2	319.0	337.7	293.1	65.0	2.0
170	310.8	65.8	108.2	95.3	364.1	279.4	313.7	338.1	289.5	65.8	2.1
171	307.0	66.0	107.6	94.4	360.3	276.1	309.2	338.4	286.3	66.0	2.1
172	303.9	65.6	107.4	93.8	356.7	273.0	305.6	338.5	283.3	65.6	2.1
173	302.2	65.0	106.9	93.0	353.2	270.3	302.0	338.5	280.5	65.0	2.0
174	302.3	64.9	107.0	102.6	358.3	278.4	312.8	338.5	290.4	64.9	2.0
175	307.0	64.7	107.2	112.5	368.5	290.4	326.7	338.6	302.2	64.7	1.4
176	309.3	64.8	107.2	97.1	365.1	285.7	318.3	338.9	295.3	64.8	1.5
177	306.8	65.5	107.0	95.7	360.0	280.7	310.7	339.3	289.9	65.5	1.6
178	303.6	65.2	106.6	94.5	355.5	276.4	304.9	339.7	285.9	65.2	1.6
179	300.2	64.8	106.2	93.0	351.3	272.6	300.5	339.9	282.5	64.8	1.6
180	298.4	65.1	106.0	101.0	353.6	277.4	307.6	340.0	288.9	65.1	1.7
181	302.1	65.1	106.2	111.2	363.2	289.1	321.1	340.0	300.7	65.1	1.2
182	304.7	64.5	105.9	97.3	361.7	286.6	316.0	340.3	296.4	64.5	1.1
183	302.2	64.6	105.9	95.1	356.0	280.7	307.8	340.7	290.1	64.6	1.3
184	298.8	64.4	105.8	93.5	351.0	275.8	301.6	341.2	285.5	64.4	1.3
185	296.0	65.4	105.3	93.0	346.5	271.5	296.7	341.3	281.4	65.4	1.4
186	296.6	65.0	105.6	106.3	354.5	282.9	311.5	341.4	294.5	65.0	1.2
187	300.8	64.7	105.6	120.9	363.3	293.1	323.1	341.5	304.3	64.7	0.7
188	301.0	64.0	105.4	96.0	356.1	283.8	310.0	341.9	293.0	64.0	0.9
189	297.6	64.4	105.0	94.2	350.4	278.2	302.4	342.3	287.1	64.4	1.0
190	293.6	66.2	104.6	93.4	345.5	273.5	296.5	342.5	282.4	66.2	1.1

Appendix F 10 hours break-in period (page 8 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	scale
191	291.1	64.9	104.4	99.9	345.3	275.6	300.3	342.6	286.2	64.9	1.2
192	293.6	64.8	104.5	110.2	354.0	286.8	313.6	342.6	297.9	64.8	0.8
193	296.9	64.0	104.6	98.6	356.3	288.7	313.7	342.8	298.0	64.0	0.5
194	293.8	63.9	104.2	94.8	348.8	280.7	303.2	343.1	289.5	63.9	0.7
195	288.6	66.0	103.6	93.7	342.4	274.9	296.0	343.5	283.8	66.0	0.9
196	284.0	65.2	103.1	95.5	337.5	272.0	293.9	343.5	281.6	65.2	1.1
197	284.8	65.1	102.9	108.5	345.3	283.8	308.0	343.4	295.0	65.1	0.7
198	288.1	63.9	102.8	101.0	349.3	289.1	312.3	343.4	299.4	63.9	0.3
199	286.4	64.0	102.4	94.5	340.4	279.7	300.7	343.6	289.0	64.0	0.5
200	282.7	64.6	102.2	92.9	333.8	273.1	292.9	343.8	283.0	64.6	0.7
201	280.5	64.7	102.0	102.5	335.4	278.1	300.1	343.8	290.2	64.7	0.7
202	282.7	64.5	102.0	111.3	342.2	287.5	311.5	343.8	299.9	64.5	0.3
203	284.9	64.1	101.9	96.8	340.3	284.8	306.6	343.9	295.7	64.1	0.2
204	282.1	64.1	101.7	93.8	332.7	276.5	296.0	344.1	287.3	64.1	0.4
205	277.8	65.3	101.1	92.6	326.5	270.0	288.6	344.2	281.3	65.3	0.5
206	277.4	64.8	101.1	106.7	332.6	280.0	301.9	344.1	293.9	64.8	0.4
207	280.4	64.6	101.0	113.0	339.0	288.2	311.7	344.0	302.2	64.6	0.3
208	280.9	64.3	101.1	95.4	332.2	279.1	299.5	344.1	291.5	64.3	0.2
209	277.4	64.6	100.6	93.2	325.5	271.7	290.1	344.2	284.1	64.6	0.1
210	275.2	65.0	100.6	103.4	327.5	276.4	296.9	344.2	291.3	64.6	0.0

January 13th, 2015

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
1	203.8	63.9	80.8	89.9	477.9	195.4	197.8	235.8	200.7	64.1	36.0
2	203.5	64.2	80.7	89.6	476.0	194.3	197.0	235.8	199.7	64.5	35.9
3	203.4	64.0	80.6	89.2	474.3	193.1	196.4	235.7	198.8	63.6	35.8
4	201.2	64.1	80.7	88.9	473.0	192.4	196.0	235.6	197.9	63.9	35.2
5	202.5	63.8	80.7	88.6	471.4	191.7	195.6	235.5	197.5	64.8	34.8
6	201.1	64.1	80.6	88.6	470.4	191.0	195.4	235.3	197.0	65.8	34.7
7	199.6	63.8	80.6	95.6	476.2	195.8	201.8	235.2	203.0	65.3	34.8

Appendix F 10 hours break-in period (page 9 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
8	203.1	63.8	80.5	106.5	490.7	205.7	212.9	235.0	213.3	65.4	34.7
9	208.3	63.4	80.3	94.3	492.9	206.6	212.9	235.2	213.0	65.7	34.6
10	208.8	63.7	80.5	92.6	488.0	203.7	209.1	235.4	209.9	65.6	34.5
11	207.9	63.8	80.6	91.7	484.7	201.8	206.9	235.7	208.2	65.7	34.4
12	206.0	63.7	80.6	90.9	481.9	200.3	205.3	235.8	206.9	65.7	34.3
13	205.9	63.9	80.6	90.4	479.7	199.0	204.3	235.9	205.8	66.2	34.2
14	203.2	63.6	80.6	89.9	477.2	197.8	203.6	235.9	204.8	66.6	34.1
15	203.4	63.8	80.5	89.6	475.1	196.9	203.1	235.8	204.2	65.8	34.2
16	201.7	63.8	80.5	89.4	474.6	196.2	202.9	235.7	203.6	65.2	33.6
17	200.5	64.0	80.4	89.2	476.7	195.6	202.7	235.5	203.2	64.5	33.1
18	199.7	64.0	80.4	89.0	477.9	195.1	202.7	235.3	202.9	66.3	33.2
19	198.4	64.1	80.3	88.8	478.4	194.8	202.6	235.2	202.6	66.2	33.3
20	199.9	63.8	80.4	101.1	492.6	204.9	214.8	235.0	214.3	65.7	33.3
21	204.2	63.1	80.1	113.2	506.4	214.1	224.8	235.0	223.6	65.6	33.3
22	203.4	63.7	79.8	93.3	496.7	209.4	218.2	235.1	217.1	65.0	32.8
23	199.3	64.0	79.8	91.8	488.4	207.4	215.2	235.3	214.8	65.2	32.5
24	196.9	63.7	79.8	90.8	480.1	205.8	213.3	235.4	213.2	64.5	32.6
25	194.6	63.7	79.7	89.9	472.2	204.4	211.7	235.4	211.8	64.7	32.7
26	191.4	64.0	79.6	89.2	464.9	203.2	210.5	235.3	210.5	64.4	32.6
27	190.2	64.0	79.5	88.8	458.6	202.0	209.5	235.2	209.5	64.1	32.2
28	188.8	63.6	79.3	99.4	465.5	210.4	219.8	235.1	219.4	64.1	32.1
29	193.2	63.6	79.2	109.0	476.9	219.8	230.6	235.1	229.0	64.6	32.2
30	195.7	63.2	79.0	93.1	472.2	217.0	225.9	235.2	224.4	64.7	32.3
31	194.4	63.8	79.1	91.5	465.7	213.9	221.4	235.4	220.9	64.3	31.9
32	192.2	63.6	79.2	90.5	460.2	211.5	218.5	235.7	218.4	63.8	31.5
33	190.8	63.9	79.2	89.6	456.0	209.1	216.4	235.7	216.4	64.3	31.7
34	188.9	64.1	79.1	89.0	452.8	207.3	214.5	235.7	214.6	64.2	31.9
35	189.8	63.7	79.1	100.5	463.9	215.7	225.0	235.6	224.7	63.9	31.5
36	192.7	63.5	79.0	110.2	477.7	224.8	235.5	235.5	233.9	63.8	31.2
37	195.4	63.6	78.7	93.4	472.9	220.9	229.6	235.7	228.1	64.4	31.3
38	193.7	63.7	78.8	91.6	466.5	217.5	224.9	235.8	224.3	64.0	31.5
39	190.6	63.7	78.9	90.6	460.0	214.5	221.7	236.1	221.4	63.9	31.2

Appendix F 10 hours break-in period (page 10 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
40	188.4	63.7	78.9	89.7	454.1	212.0	219.4	236.1	219.1	63.6	30.8
41	187.2	63.6	78.8	89.0	449.0	209.9	217.5	236.1	216.9	63.9	30.9
42	187.6	63.6	78.8	102.6	460.3	220.1	230.0	236.0	228.6	63.9	31.2
43	190.0	63.2	78.5	114.9	472.1	229.0	240.2	236.0	237.5	63.8	30.8
44	191.1	63.4	78.3	92.7	463.4	222.5	231.5	236.2	229.3	63.5	30.4
45	189.1	64.1	78.5	91.3	457.3	219.0	227.1	236.5	225.4	63.9	30.5
46	187.2	63.7	78.4	90.2	452.5	216.2	223.8	236.6	222.3	64.2	30.8
47	183.8	63.7	78.4	89.3	446.9	213.6	221.3	236.6	219.8	63.5	30.4
48	181.1	63.5	78.3	95.6	447.1	216.6	226.3	236.6	224.0	63.4	30.0
49	181.6	63.3	78.1	106.7	457.0	226.6	237.7	236.5	234.4	63.6	30.1
50	183.3	62.9	77.7	94.4	457.1	228.6	238.7	236.5	235.0	63.9	30.2
51	182.7	63.7	77.6	91.5	445.9	223.5	232.3	236.8	229.3	63.8	30.2
52	179.3	63.3	77.7	89.9	436.4	220.0	228.0	237.1	225.4	63.6	30.4
53	176.0	63.5	77.7	89.9	428.4	217.5	226.0	237.2	223.3	63.6	29.8
54	174.8	63.4	77.6	104.2	437.4	228.2	238.9	237.3	235.5	63.7	29.4
55	177.3	63.2	77.3	111.2	445.0	236.4	248.4	237.4	243.7	63.7	29.6
56	178.5	64.3	77.1	92.7	435.6	230.2	239.9	237.8	235.6	64.0	29.6
57	175.9	63.5	77.2	90.5	426.9	225.4	233.8	238.2	230.7	63.8	29.6
58	172.1	63.6	77.2	89.3	418.6	221.6	229.6	238.5	226.9	63.7	29.5
59	169.9	63.3	77.1	103.9	426.0	231.7	242.2	238.7	238.8	63.7	29.5
60	171.7	63.2	76.9	110.9	432.0	239.4	251.3	238.8	246.6	64.1	29.3
61	174.1	63.6	76.6	92.6	422.3	233.8	243.4	239.2	239.2	63.9	29.1
62	169.9	63.6	76.8	90.3	410.8	228.6	236.8	239.6	233.8	63.6	28.4
63	166.8	63.5	76.7	98.7	408.7	232.2	241.7	240.0	239.0	63.8	28.4
64	166.3	63.4	76.5	108.9	411.9	240.5	251.4	240.3	247.5	64.3	28.5
65	167.2	63.1	76.2	95.0	406.7	242.2	251.7	240.7	248.1	64.4	28.5
66	166.1	63.5	76.2	90.8	391.3	234.7	242.4	241.2	239.9	64.0	28.4
67	162.7	63.5	76.2	97.5	383.8	236.1	244.5	241.6	242.6	64.4	28.4
68	162.2	63.5	76.0	108.4	385.7	244.4	253.7	242.1	251.3	64.4	28.3
69	162.8	62.8	75.8	113.7	386.5	250.5	259.9	242.5	257.2	64.3	28.3
70	163.3	64.2	75.8	91.3	371.4	240.2	247.3	243.3	245.1	64.0	27.7
71	160.9	63.5	75.8	97.8	365.7	240.1	247.8	243.8	246.4	63.3	27.2

Appendix F 10 hours break-in period (page 11 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
72	159.5	63.4	75.7	108.5	368.7	247.8	256.6	244.3	254.6	63.7	27.4
73	161.1	63.2	75.5	113.4	370.6	253.6	263.2	244.8	260.4	64.3	27.4
74	161.6	63.5	75.3	91.7	357.5	243.5	250.6	245.4	248.6	64.2	27.7
75	157.7	63.5	75.5	98.2	352.1	243.1	250.8	245.9	249.6	63.9	27.2
76	157.6	63.4	75.3	108.9	354.9	250.2	258.9	246.3	257.2	63.8	26.7
77	157.0	63.2	75.1	113.3	356.8	255.5	264.9	246.8	262.5	63.7	26.7
78	159.0	63.5	75.0	92.1	345.8	246.3	252.7	247.5	251.6	64.0	26.8
79	156.2	63.5	75.2	99.1	341.0	245.6	252.7	248.0	252.3	64.1	27.1
80	155.9	63.4	75.0	109.8	344.2	252.3	260.3	248.4	259.3	63.8	26.6
81	156.0	62.9	74.8	119.9	346.2	257.2	265.8	248.9	264.2	63.6	26.1
82	155.9	63.5	74.8	91.3	333.6	245.6	251.4	249.5	250.8	64.1	26.2
83	153.5	63.3	75.0	103.3	333.1	249.2	255.7	249.9	256.0	64.0	26.3
84	153.5	63.1	74.8	111.0	335.7	254.7	262.3	250.3	261.5	63.9	26.5
85	154.8	63.0	74.6	100.4	336.4	257.2	263.3	250.8	263.1	64.0	26.0
86	153.3	63.3	74.6	90.9	324.0	245.6	250.1	251.4	250.3	63.8	25.5
87	150.9	63.3	74.7	106.2	326.4	251.8	257.8	251.8	258.2	64.5	25.6
88	152.8	63.3	74.5	112.3	329.0	256.7	263.6	252.2	263.0	63.9	25.7
89	154.1	63.1	74.3	97.3	328.4	257.1	262.4	252.7	262.2	64.3	25.8
90	152.9	63.9	74.4	91.0	317.1	246.0	249.6	253.2	249.8	64.1	25.9
91	151.5	63.5	74.5	106.5	319.9	252.4	257.6	253.6	258.0	63.8	25.4
92	151.4	63.3	74.3	112.3	322.6	257.3	263.3	253.9	262.7	63.7	24.8
93	152.7	62.9	74.1	98.3	322.7	258.1	262.5	254.2	262.6	63.7	24.9
94	150.6	63.7	74.3	90.8	311.4	246.5	249.2	254.7	249.7	64.1	25.0
95	149.3	63.4	74.3	106.5	314.8	253.3	257.5	255.0	258.0	64.0	25.1
96	150.6	63.3	74.1	112.3	317.7	258.0	263.0	255.3	262.4	64.0	25.2
97	151.6	63.1	73.9	97.6	317.7	258.3	261.6	255.7	261.5	63.7	24.7
98	150.4	63.4	74.1	91.0	307.0	247.0	249.0	256.1	249.0	63.7	24.0
99	147.1	63.3	74.1	106.8	310.8	253.9	257.0	256.4	257.3	64.8	24.2
100	149.5	63.3	74.0	112.3	313.8	258.5	262.4	256.6	261.6	64.1	24.3
101	150.5	62.9	73.8	98.9	314.5	259.4	261.7	256.9	261.4	64.0	24.3
102	148.8	63.5	73.9	91.4	304.0	247.9	249.0	257.3	248.6	65.4	24.2
103	147.3	63.3	74.0	107.3	308.0	254.9	256.9	257.5	256.8	64.3	24.2

Appendix F 10 hours break-in period (page 12 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
104	146.2	63.1	73.8	112.4	311.0	259.6	262.2	257.7	260.9	64.1	24.1
105	148.1	62.7	73.6	97.4	311.3	259.7	260.5	258.0	259.7	64.1	24.0
106	147.9	63.6	73.8	92.1	301.4	248.7	248.7	258.3	247.9	64.1	23.9
107	147.3	63.4	73.8	108.0	305.7	255.9	256.6	258.6	256.1	64.0	23.7
108	146.6	63.2	73.7	112.6	308.6	260.4	261.5	258.7	260.0	63.8	23.1
109	147.2	62.7	73.5	96.6	308.5	259.9	259.4	258.9	258.0	64.3	23.0
110	148.4	63.3	73.7	93.9	299.7	250.3	249.7	259.3	248.1	63.9	23.1
111	147.0	63.3	73.7	108.6	304.1	257.3	256.8	259.5	255.7	63.9	23.3
112	146.3	63.2	73.5	113.0	307.2	261.7	261.6	259.7	259.4	63.8	22.8
113	147.2	62.7	73.3	96.3	306.8	260.7	258.8	260.0	256.9	63.8	22.4
114	147.2	63.4	73.5	94.6	298.5	251.8	249.8	260.2	247.5	63.8	22.6
115	145.7	63.2	73.6	108.9	302.8	258.7	256.6	260.4	254.9	64.0	22.7
116	147.4	63.3	73.5	113.2	306.0	263.1	261.3	260.6	258.5	63.7	22.4
117	148.9	63.1	73.3	95.8	305.3	261.6	257.8	260.8	255.5	63.5	22.0
118	147.0	63.3	73.5	95.2	297.6	253.3	249.4	261.1	246.9	64.5	22.1
119	145.7	63.2	73.5	108.9	302.0	260.0	256.3	261.3	254.0	63.8	22.3
120	146.7	63.2	73.3	113.1	305.1	264.4	261.0	261.5	257.7	63.6	22.0
121	148.5	62.9	73.2	98.3	305.6	264.7	259.4	261.7	256.5	63.4	21.7
122	147.2	63.4	73.3	93.5	296.4	254.1	248.6	262.0	245.4	63.2	21.6
123	145.5	63.4	73.4	108.5	300.7	261.1	255.8	262.2	253.0	63.7	21.9
124	147.1	63.2	73.3	113.1	303.9	265.6	260.5	262.3	256.7	63.5	21.6
125	146.8	62.8	73.1	97.5	304.3	265.3	258.5	262.6	255.0	63.4	21.3
126	145.2	63.3	73.3	94.0	295.4	255.1	248.4	262.8	244.5	62.9	21.0
127	144.2	63.3	73.4	108.5	299.6	262.1	255.4	263.0	251.8	63.9	21.3
128	145.5	63.0	73.2	113.0	302.8	266.6	260.1	263.1	255.5	63.7	21.3
129	146.3	63.0	73.0	96.6	302.7	265.9	257.5	263.2	253.2	63.6	20.9
130	144.5	63.3	73.2	94.2	294.3	256.3	248.0	263.5	243.5	63.3	20.6
131	144.5	63.2	73.3	108.6	298.6	263.4	254.9	263.7	250.7	64.1	20.8
132	145.2	63.0	73.1	112.8	301.7	267.8	259.5	263.7	254.3	63.8	20.9
133	145.5	62.6	73.0	102.9	303.7	270.0	260.1	263.9	255.4	63.6	20.4
134	144.8	63.5	73.0	91.3	293.5	257.2	246.3	264.2	241.9	63.5	20.2
135	143.7	63.2	73.2	107.3	297.5	264.3	254.0	264.3	249.7	63.7	20.3

Appendix F 10 hours break-in period (page 13 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
136	144.6	63.1	73.1	112.5	300.5	268.8	258.8	264.4	253.3	63.6	20.5
137	146.0	62.5	73.0	117.1	303.3	272.6	261.9	264.6	256.1	63.4	20.1
138	146.1	63.1	73.0	91.0	293.1	259.2	246.7	264.9	241.7	63.2	19.7
139	144.2	63.2	73.2	106.3	296.0	265.0	253.1	265.1	248.3	64.3	19.9
140	144.6	63.1	73.0	111.9	299.1	269.6	257.9	265.2	252.1	63.7	20.1
141	145.4	62.9	72.9	115.1	302.0	273.7	261.6	265.4	255.2	63.4	19.7
142	146.3	63.4	72.9	91.4	293.1	261.5	247.0	265.6	242.0	63.3	19.2
143	144.7	63.3	73.1	105.1	294.9	265.8	251.9	265.9	247.1	64.6	19.4
144	144.0	63.1	73.0	111.7	298.3	270.7	257.1	266.0	251.0	63.6	19.6
145	145.1	62.9	72.9	114.6	301.0	274.7	260.8	266.1	254.1	63.5	19.2
146	145.8	63.2	72.8	91.9	293.6	264.2	248.4	266.4	242.6	63.2	18.8
147	144.1	63.1	73.0	103.1	293.6	266.2	250.5	266.7	245.5	63.7	19.0
148	143.7	63.0	72.9	111.0	297.1	271.5	256.0	266.8	249.8	63.7	19.2
149	144.1	63.0	72.8	114.2	300.0	275.6	259.9	267.0	252.9	63.6	18.7
150	146.2	63.2	72.7	93.0	295.2	268.5	250.9	267.3	244.7	63.0	18.2
151	144.2	63.2	72.9	101.4	292.8	267.0	249.9	267.6	244.4	63.6	18.4
152	145.0	63.0	72.9	110.7	296.5	272.6	255.5	267.7	249.1	64.1	18.5
153	145.5	62.9	72.8	113.9	299.5	276.7	259.5	267.9	252.4	63.6	18.5
154	145.7	63.0	72.7	93.7	296.1	271.2	252.2	268.3	245.7	63.7	17.9
155	145.1	63.2	72.9	99.0	291.9	267.0	248.4	268.5	242.3	64.0	17.7
156	144.7	63.1	72.9	109.9	296.1	273.2	254.4	268.7	247.8	63.8	17.8
157	146.2	62.9	72.8	113.5	299.2	277.4	258.7	268.9	251.1	64.1	17.9
158	146.3	62.8	72.6	94.3	297.0	273.6	253.1	269.1	245.9	64.0	17.8
159	145.2	63.2	72.9	97.5	291.4	267.0	247.2	269.4	240.5	64.4	17.8
160	144.7	63.1	72.9	109.3	295.7	273.6	253.4	269.6	246.5	64.2	17.7
161	144.8	62.9	72.7	113.0	299.0	278.0	257.9	269.7	249.9	64.0	17.3
162	146.8	63.2	72.6	96.7	299.4	277.1	255.3	270.0	248.1	63.3	16.6
163	144.8	63.5	72.9	94.3	291.3	266.8	245.8	270.2	238.5	64.2	16.8
164	144.9	63.1	72.8	108.2	295.9	274.0	252.6	270.4	245.4	64.3	16.8
165	144.7	63.0	72.7	112.5	299.1	278.6	257.2	270.5	249.0	64.2	16.8
166	146.0	62.5	72.6	115.3	302.3	282.3	260.3	270.7	251.7	64.2	16.8
167	145.6	63.2	72.7	91.1	292.5	268.3	244.9	271.0	237.4	64.3	16.7

Appendix F 10 hours break-in period (page 14 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
168	146.1	63.0	72.9	106.6	296.1	274.6	251.9	271.3	244.4	64.6	16.6
169	144.8	63.0	72.8	112.0	299.6	279.2	256.7	271.4	248.1	64.4	16.5
170	145.5	62.8	72.6	115.3	302.8	283.4	260.6	271.6	251.2	64.1	16.3
171	146.3	63.2	72.6	91.4	293.9	270.4	245.9	271.9	238.0	64.3	16.2
172	145.7	63.2	72.8	105.5	296.5	275.3	251.3	272.2	243.5	64.4	16.1
173	145.5	63.0	72.7	111.7	300.0	280.1	256.4	272.3	247.4	64.8	15.9
174	146.5	62.8	72.6	115.0	303.4	284.3	260.4	272.5	250.5	64.5	15.8
175	147.0	63.2	72.6	92.1	296.4	273.6	248.1	272.8	239.3	64.3	15.7
176	144.7	63.1	72.8	102.7	296.4	274.7	249.8	273.1	241.6	64.4	15.6
177	145.3	63.0	72.8	110.7	300.3	280.1	255.5	273.2	246.1	64.6	15.5
178	146.2	62.9	72.6	114.2	303.8	284.4	259.7	273.4	249.3	64.6	15.3
179	147.3	63.3	72.6	93.0	299.4	277.1	250.9	273.6	241.3	64.6	15.2
180	144.6	63.1	72.8	99.6	296.4	274.1	248.7	274.0	239.7	64.2	15.1
181	145.6	63.0	72.8	110.0	300.6	280.3	254.8	274.1	245.0	64.1	15.0
182	146.6	62.8	72.6	113.4	304.1	284.8	259.3	274.3	248.4	64.1	14.9
183	148.7	62.9	72.6	94.0	301.5	279.9	253.0	274.5	242.7	64.3	14.8
184	145.9	63.0	72.7	97.1	296.6	273.8	247.7	274.8	238.0	64.4	14.7
185	146.4	62.9	72.8	109.1	301.3	280.6	254.4	275.0	244.1	64.2	14.8
186	146.3	62.8	72.7	113.0	304.8	285.2	259.1	275.2	247.7	64.1	14.2
187	148.6	62.5	72.5	95.6	304.4	283.1	255.8	275.4	244.7	63.5	13.6
188	147.0	63.1	72.7	93.9	297.0	273.2	246.8	275.7	236.1	63.9	13.8
189	144.8	63.0	72.8	108.4	302.2	280.7	254.2	276.0	243.4	64.1	13.9
190	146.2	62.8	72.7	112.6	305.9	285.4	259.1	276.1	247.1	64.3	13.9
191	146.2	63.1	72.4	96.1	306.1	284.0	256.2	276.3	245.0	64.2	13.9
192	146.0	63.3	72.6	91.5	297.5	272.3	245.0	276.7	234.4	64.2	13.8
193	144.5	63.0	72.8	107.2	302.5	280.1	253.2	276.9	242.4	64.2	13.8
194	146.0	62.9	72.6	112.0	306.2	285.1	258.4	277.0	246.3	64.2	13.7
195	146.5	62.3	72.5	109.0	309.4	288.4	260.8	277.2	248.9	64.1	13.6
196	146.5	63.7	72.6	91.1	299.7	274.3	246.3	277.6	235.3	64.0	13.7
197	145.6	63.2	72.8	105.9	303.1	280.4	253.2	277.8	241.9	63.8	13.1
198	145.2	62.9	72.6	111.7	306.9	285.4	258.6	278.0	246.1	63.4	12.6
199	148.4	62.7	72.5	115.5	310.3	289.8	262.7	278.3	249.5	64.0	12.8

Appendix F 10 hours break-in period (page 15 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
200	148.1	63.3	72.5	91.5	301.1	276.0	247.9	278.6	236.6	64.0	12.9
201	146.1	63.0	72.8	104.8	303.5	280.5	253.3	278.9	241.9	63.9	12.9
202	145.3	62.9	72.7	111.5	307.2	285.8	259.0	279.0	246.1	64.1	12.9
203	147.3	62.8	72.5	114.9	310.6	290.1	263.1	279.3	249.6	64.0	12.8
204	147.9	63.1	72.5	91.8	303.0	278.0	249.8	279.7	237.7	64.2	12.7
205	146.7	63.0	72.7	104.2	304.6	280.9	253.6	280.0	241.8	64.3	12.7
206	146.1	62.9	72.6	111.3	308.7	286.1	259.3	280.2	246.2	63.8	12.5
207	147.1	62.8	72.5	114.7	312.5	290.4	263.8	280.4	249.8	63.7	11.8
208	149.0	63.4	72.5	91.8	304.4	277.7	249.9	280.8	237.6	63.5	11.8
209	147.0	63.0	72.7	103.3	305.6	280.1	253.2	281.0	241.1	63.8	11.9
210	146.9	62.9	72.7	110.9	309.9	285.5	259.2	281.2	245.8	63.8	12.0
211	148.7	62.8	72.5	114.4	313.8	290.0	263.8	281.4	249.5	63.8	12.0
212	148.8	62.9	72.5	92.1	306.6	278.9	251.6	281.7	238.6	63.9	11.9
213	147.2	62.9	72.8	102.2	306.6	279.7	253.1	282.0	240.8	64.2	11.8
214	147.4	62.9	72.7	110.8	311.1	285.4	259.3	282.2	245.8	64.0	11.8
215	148.3	62.8	72.6	114.4	315.1	289.9	264.2	282.4	249.6	64.1	11.7
216	150.0	63.4	72.5	92.7	309.1	280.3	253.6	282.7	240.2	63.8	11.6
217	147.7	63.0	72.8	101.0	307.6	279.1	253.7	283.0	240.8	64.1	11.5
218	146.8	62.9	72.7	110.5	312.2	285.3	260.4	283.1	246.1	63.8	11.5
219	147.0	62.7	72.5	114.2	315.8	289.8	265.2	283.3	250.0	63.8	10.8
220	148.5	63.7	72.5	92.5	309.2	279.5	253.8	283.6	240.0	63.4	10.5
221	147.5	63.0	72.8	101.3	308.2	279.2	254.6	283.8	241.2	63.7	10.7
222	146.7	62.9	72.7	110.7	312.5	285.3	261.0	284.0	246.6	63.8	10.8
223	148.2	62.7	72.5	114.3	315.9	289.8	266.0	284.0	250.5	63.7	10.7
224	147.6	63.0	72.5	92.2	308.8	279.0	253.9	284.3	240.0	63.9	10.7
225	147.3	63.1	72.7	101.6	307.7	279.2	255.2	284.5	241.9	63.6	10.7
226	147.3	63.0	72.7	110.3	311.9	285.1	261.7	284.6	247.3	63.8	10.6
227	147.8	62.7	72.5	114.0	315.2	289.5	266.4	284.6	251.2	63.8	10.5
228	148.8	63.2	72.4	92.6	309.2	280.2	255.9	284.9	242.1	64.0	10.5
229	146.2	63.0	72.7	100.0	307.1	278.4	255.1	285.1	242.0	64.0	10.4
230	146.7	62.8	72.6	110.0	311.4	284.5	261.8	285.1	247.8	64.1	10.3
231	147.9	62.7	72.5	113.8	314.9	288.9	266.7	285.2	251.7	63.8	10.0

Appendix F 10 hours break-in period (page 16 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
232	148.0	63.0	72.4	92.8	309.1	280.1	256.9	285.4	243.0	63.1	9.4
233	147.1	62.9	72.6	101.1	307.1	278.4	256.5	285.6	243.5	63.7	9.6
234	147.1	62.9	72.6	110.4	311.4	284.2	262.9	285.6	248.9	64.0	9.7
235	145.5	62.7	72.4	114.2	314.8	288.4	267.7	285.7	253.0	63.7	9.7
236	147.3	63.1	72.3	92.8	308.7	278.7	257.2	285.8	243.7	63.7	9.8
237	145.4	63.1	72.6	100.3	306.1	276.6	256.2	286.0	243.6	64.0	9.7
238	146.6	62.8	72.6	110.3	310.2	282.5	262.8	286.0	249.3	64.0	9.7
239	147.1	62.8	72.4	113.9	313.7	286.6	267.6	286.0	253.3	63.6	9.5
240	148.0	63.1	72.4	93.2	308.9	278.8	258.6	286.1	245.3	63.6	8.9
241	146.2	62.9	72.5	98.8	305.0	274.5	255.6	286.3	243.2	63.2	8.9
242	145.8	62.8	72.6	109.7	309.2	280.6	262.5	286.3	249.4	63.8	9.1
243	145.2	62.6	72.4	113.5	312.5	284.8	267.5	286.3	253.5	63.6	9.2
244	147.6	63.0	72.3	94.2	309.6	279.4	261.2	286.4	247.9	63.9	9.2
245	146.6	63.0	72.6	96.1	303.3	271.6	254.7	286.6	242.2	64.1	9.1
246	145.9	62.9	72.6	108.8	307.5	278.5	262.1	286.6	249.4	63.7	9.0
247	145.3	62.7	72.4	113.0	310.3	282.8	267.2	286.5	253.4	63.5	8.4
248	146.4	62.8	72.2	95.5	308.8	280.2	263.4	286.6	250.4	63.6	8.4
249	146.1	63.0	72.5	93.8	300.1	269.8	254.3	286.7	241.8	63.7	8.6
250	144.9	62.9	72.6	108.4	304.3	277.0	262.0	286.8	249.7	63.7	8.7
251	145.3	62.7	72.4	112.5	306.8	281.2	267.1	286.7	253.7	63.7	8.7
252	146.1	62.9	72.2	97.4	306.7	280.5	265.5	286.8	252.7	63.6	8.7
253	144.7	63.5	72.5	91.8	296.7	267.8	253.6	286.9	241.2	63.6	8.4
254	142.8	63.1	72.5	107.3	300.5	275.0	261.9	287.0	249.5	63.2	7.9
255	144.9	62.8	72.4	112.3	303.2	279.2	266.9	286.9	253.6	63.4	8.0
256	145.1	62.4	72.2	120.0	305.6	282.6	270.7	286.9	257.0	64.1	8.2
257	145.9	62.9	72.3	91.0	294.9	267.9	254.5	287.1	242.7	63.7	8.2
258	144.7	62.9	72.5	105.7	297.3	273.3	261.3	287.1	249.5	63.7	8.2
259	145.0	62.8	72.3	111.5	300.0	277.5	266.5	287.0	253.6	63.5	8.3
260	144.4	62.6	72.2	114.6	302.4	280.9	270.5	287.0	257.0	63.3	7.8
261	144.2	63.1	72.1	91.3	292.9	267.6	255.5	287.1	243.7	62.9	7.5
262	142.7	63.0	72.4	104.6	294.2	271.3	260.3	287.2	248.9	63.7	7.7
263	142.0	62.8	72.2	111.1	297.0	275.5	265.6	287.0	253.1	63.3	7.9

Appendix F 10 hours break-in period (page 17 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
264	144.1	62.7	72.2	114.2	299.3	278.8	269.6	287.0	256.3	63.5	8.1
265	144.0	63.0	72.1	92.1	292.4	268.6	257.9	287.0	246.0	63.4	7.7
266	141.5	62.8	72.3	102.1	291.0	268.3	258.8	287.0	247.6	63.2	7.2
267	142.6	62.8	72.2	110.2	294.1	272.8	264.4	286.9	252.2	64.3	7.3
268	143.4	62.7	72.1	113.5	296.5	276.2	268.5	286.8	255.4	63.5	7.5
269	144.4	62.5	72.0	92.6	291.4	268.4	259.3	286.8	247.2	63.6	7.7
270	142.8	62.8	72.2	100.8	288.6	266.1	258.1	286.7	246.7	63.3	7.5
271	142.0	62.7	72.2	109.9	291.7	270.7	263.7	286.6	251.4	63.2	7.0
272	142.9	62.7	72.0	113.2	294.1	274.1	267.9	286.4	254.6	63.6	7.1
273	143.6	62.5	71.9	93.8	291.2	268.9	261.6	286.3	249.0	63.6	7.3
274	142.0	62.8	72.1	98.6	286.2	263.4	256.9	286.3	245.1	63.5	7.5
275	140.8	62.7	72.1	109.0	289.6	268.4	262.8	286.1	250.4	63.4	7.1
276	141.4	62.6	72.0	112.4	292.0	271.8	266.9	285.9	253.7	63.1	6.8
277	142.9	62.4	71.8	95.7	291.2	269.5	263.5	285.8	251.0	63.5	7.1
278	142.1	62.8	72.0	95.7	283.6	260.3	255.1	285.7	243.0	63.5	7.3
279	140.4	62.7	72.1	108.4	287.3	266.0	261.3	285.6	249.2	63.5	7.0
280	141.4	62.5	71.9	112.1	289.8	269.3	265.7	285.3	252.5	62.8	6.6
281	141.3	62.4	71.8	106.3	291.8	271.3	266.9	285.2	254.2	64.2	6.9
282	141.8	62.9	71.8	92.4	282.0	257.9	253.6	285.1	241.1	63.5	7.2
283	140.8	62.7	72.0	107.3	285.8	264.1	260.6	284.9	248.3	63.4	6.9
284	141.3	62.5	71.9	111.6	288.4	267.4	265.0	284.6	251.7	63.2	6.5
285	142.0	62.3	71.7	116.3	290.8	270.3	268.4	284.4	254.4	63.5	6.8
286	141.7	63.6	71.8	90.8	280.8	256.4	252.5	284.4	240.3	63.5	7.1
287	141.3	62.8	72.0	106.4	284.2	262.1	259.8	284.2	247.4	63.4	6.8
288	141.0	62.6	71.8	111.2	286.8	265.5	264.1	283.9	250.8	63.2	6.5
289	142.8	62.4	71.7	113.7	289.2	268.3	267.6	283.7	253.5	63.5	6.7
290	142.6	63.7	71.7	91.5	281.9	257.5	254.8	283.7	242.2	63.5	7.0
291	141.0	62.7	72.0	104.2	282.7	259.8	258.2	283.5	245.9	63.4	6.7
292	140.9	62.6	71.8	110.4	285.6	263.4	262.9	283.2	249.6	62.9	6.4
293	141.5	62.5	71.7	113.5	288.0	266.3	266.6	283.0	252.3	63.5	6.7
294	142.2	62.6	71.6	92.3	283.1	258.5	257.1	282.9	243.7	63.3	6.8
295	140.9	62.8	71.8	101.4	281.1	257.2	256.5	282.8	244.0	63.1	6.5

Appendix F 10 hours break-in period (page 18 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
296	140.3	62.6	71.8	109.7	284.3	261.3	261.7	282.6	248.1	63.0	6.3
297	140.9	62.5	71.7	112.7	286.7	264.2	265.3	282.3	250.9	63.3	6.6
298	141.9	62.2	71.5	93.8	284.4	260.0	259.4	282.2	246.0	63.3	6.7
299	140.7	62.6	71.8	98.2	279.4	254.2	254.3	282.1	241.6	63.3	6.4
300	140.2	62.6	71.7	108.8	282.8	259.1	260.0	281.8	246.6	63.1	6.2
301	140.6	62.5	71.7	111.9	285.2	262.0	263.8	281.5	249.5	63.9	6.5
302	142.2	62.1	71.5	112.3	287.4	264.4	265.9	281.4	251.7	63.5	6.6
303	142.0	63.0	71.6	91.3	277.3	250.5	250.8	281.3	237.6	63.3	6.3
304	140.9	62.7	71.7	106.6	281.0	256.4	258.0	281.1	244.8	62.9	6.1
305	140.2	62.5	71.6	111.1	283.5	259.9	262.3	280.8	248.0	63.7	6.6
306	139.9	62.4	71.5	113.5	285.8	262.5	265.7	280.6	250.5	63.4	6.5
307	141.9	63.3	71.5	91.2	278.9	252.3	253.4	280.5	239.6	63.3	6.2
308	139.5	62.6	71.7	102.9	279.0	253.6	255.9	280.4	242.4	63.1	6.1
309	140.1	62.5	71.6	109.8	281.8	257.3	260.8	280.1	246.2	63.4	6.6
310	140.1	62.5	71.5	112.4	284.0	260.1	264.4	279.8	248.8	63.3	6.4
311	141.3	62.2	71.4	93.2	281.3	255.4	258.0	279.7	243.1	63.3	6.1
312	139.0	62.7	71.5	99.6	277.5	251.4	254.8	279.6	240.6	62.9	6.0
313	139.3	62.6	71.5	109.1	280.6	255.6	260.1	279.3	245.1	63.5	6.5
314	140.0	62.4	71.4	112.0	282.9	258.4	263.7	279.1	247.9	63.3	6.3
315	141.9	62.3	71.4	100.6	284.1	259.0	263.1	279.0	248.0	63.1	6.1
316	140.7	62.8	71.4	92.9	275.1	247.6	251.8	278.9	236.8	62.7	5.9
317	139.1	62.7	71.5	107.2	278.7	253.2	258.2	278.7	243.3	63.6	6.4
318	140.1	62.4	71.5	111.1	281.3	256.4	262.4	278.4	246.3	63.4	6.2
319	139.8	62.4	71.3	113.5	283.4	259.0	265.6	278.3	248.7	63.2	6.0
320	140.7	63.0	71.3	90.7	275.5	247.7	251.9	278.2	236.9	62.7	5.9
321	139.2	62.7	71.5	104.9	277.4	251.3	256.9	278.0	241.9	63.3	6.3
322	139.3	62.5	71.4	110.3	280.1	254.7	261.4	277.8	245.1	63.3	6.1
323	139.0	62.3	71.3	112.7	282.3	257.4	264.7	277.6	247.6	63.2	5.9
324	140.2	62.7	71.2	92.1	277.7	250.3	255.7	277.6	239.5	62.7	5.8
325	138.5	62.7	71.4	100.3	275.3	248.4	254.6	277.5	239.1	63.4	6.2
326	138.6	62.5	71.3	108.9	278.3	252.4	259.8	277.2	243.2	63.2	6.0
327	137.6	62.4	71.2	111.7	280.6	255.2	263.4	277.0	245.8	63.3	5.8

Appendix F 10 hours break-in period (page 19 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
328	139.7	62.3	71.2	102.8	282.2	256.2	263.5	276.9	246.6	63.1	5.7
329	138.8	62.7	71.3	93.8	273.5	245.4	252.5	276.9	235.6	63.3	6.1
330	138.0	62.6	71.3	107.5	277.1	250.6	258.5	276.7	241.7	63.2	5.9
331	139.2	62.4	71.3	111.0	279.5	253.6	262.7	276.5	244.6	63.2	5.7
332	140.1	62.4	71.2	113.3	281.8	256.2	265.6	276.4	246.9	62.9	5.6
333	140.3	63.2	71.2	90.9	274.3	245.5	252.5	276.4	235.5	63.4	6.0
334	138.7	62.6	71.4	104.4	275.8	248.5	257.0	276.3	239.9	63.4	5.9
335	139.2	62.5	71.3	110.1	278.4	251.9	261.3	276.1	243.1	63.2	5.6
336	138.9	62.2	71.3	112.5	280.7	254.5	264.6	276.0	245.6	62.8	5.5
337	140.6	62.8	71.1	92.7	277.1	248.8	257.3	276.0	239.1	63.3	6.0
338	139.6	62.7	71.4	100.3	274.2	246.1	255.2	275.9	237.8	63.3	5.8
339	138.8	62.5	71.4	108.9	277.2	250.1	260.2	275.8	241.8	63.0	5.5
340	140.3	62.4	71.2	111.6	279.4	252.8	263.7	275.6	244.4	63.0	5.4
341	140.1	62.0	71.2	106.0	281.3	254.4	264.7	275.6	245.5	63.3	5.9
342	139.7	63.1	71.3	91.6	271.7	242.2	251.1	275.6	232.8	63.2	5.7
343	139.0	62.6	71.4	106.5	275.3	247.6	257.8	275.5	239.5	63.0	5.5
344	139.0	62.4	71.2	110.4	277.7	250.6	261.9	275.3	242.4	62.6	5.3
345	139.5	62.3	71.2	112.9	280.1	253.2	265.1	275.2	244.9	63.5	5.8
346	139.9	63.0	71.1	91.4	274.4	245.0	254.5	275.3	235.5	63.2	5.6
347	138.7	62.9	71.4	102.7	274.1	245.6	256.1	275.2	237.7	63.1	5.4
348	138.8	62.6	71.3	109.4	276.9	249.1	260.8	275.1	241.2	62.5	5.2
349	139.5	62.4	71.1	112.2	279.2	251.8	264.2	275.0	243.7	63.1	5.5
350	140.3	62.6	71.1	94.1	277.7	248.8	259.4	275.0	239.6	63.2	5.6
351	139.7	62.6	71.2	98.1	272.7	243.2	254.3	275.0	235.1	63.1	5.4
352	138.4	62.4	71.3	108.3	275.9	247.5	259.5	274.9	239.7	62.9	5.1
353	140.4	62.4	71.2	111.2	278.3	250.3	263.3	274.8	242.4	63.4	5.4
354	139.6	62.2	71.1	116.3	280.6	252.9	266.3	274.8	244.7	63.3	5.5
355	139.8	62.8	71.1	91.2	271.5	240.4	251.5	274.8	231.7	63.1	5.3
356	139.1	62.6	71.3	106.0	275.2	245.8	258.3	274.7	238.3	62.9	5.1
357	139.1	62.5	71.2	110.4	277.8	248.7	262.3	274.6	241.2	63.2	5.3
358	139.5	62.3	71.1	112.7	280.1	251.4	265.6	274.5	243.6	63.1	5.5
359	140.9	62.8	71.0	91.9	275.6	244.5	256.3	274.6	235.5	63.0	5.2

Appendix F 10 hours break-in period (page 20 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
360	139.7	62.6	71.2	101.5	274.2	243.6	256.3	274.7	236.1	63.0	5.0
361	139.4	62.5	71.3	109.2	277.2	247.2	261.2	274.6	239.9	63.2	5.1
362	139.4	62.3	71.1	111.8	279.5	250.0	264.8	274.5	242.4	63.2	5.4
363	140.6	62.1	71.1	95.8	279.4	248.5	261.8	274.6	240.5	63.0	5.2
364	139.6	62.7	71.1	94.8	272.2	240.0	253.5	274.6	232.5	62.9	5.0
365	138.1	62.5	71.2	107.0	275.9	245.0	259.6	274.5	237.9	63.0	5.0
366	137.2	62.4	71.1	110.4	278.3	247.9	263.5	274.4	240.8	63.2	5.4
367	139.5	62.2	71.0	112.7	280.7	250.5	266.8	274.3	243.1	63.1	5.1
368	139.2	63.1	71.0	91.0	274.7	241.9	255.6	274.4	233.4	62.9	4.9
369	138.6	62.6	71.2	102.8	274.8	243.0	257.8	274.4	236.0	62.8	4.9
370	139.7	62.4	71.1	109.3	277.6	246.4	262.5	274.4	239.5	63.2	5.3
371	139.9	62.4	71.0	111.9	279.9	249.1	266.0	274.3	241.9	63.1	5.1
372	140.0	62.3	70.9	95.6	279.7	247.6	262.6	274.4	239.7	62.9	4.9
373	139.2	62.6	71.1	96.3	273.1	240.1	255.2	274.4	233.0	63.2	4.8
374	137.9	62.5	71.1	107.7	276.6	244.7	260.9	274.4	238.0	63.5	5.2
375	139.1	62.4	71.0	110.9	279.0	247.6	264.6	274.3	240.7	63.1	5.1
376	139.0	62.3	71.0	113.2	281.2	250.0	267.6	274.3	243.0	63.0	4.8
377	139.9	62.9	71.0	90.1	272.3	238.3	252.6	274.4	230.4	62.5	4.6
378	139.1	62.5	71.1	105.3	275.1	243.0	259.3	274.3	236.5	63.2	4.9
379	138.7	62.5	71.1	109.8	277.5	246.2	263.2	274.3	239.5	63.0	5.0
380	139.1	62.3	71.0	112.4	279.6	248.7	266.3	274.2	241.9	63.0	4.8
381	139.1	62.1	70.9	93.6	277.6	245.1	260.4	274.3	237.5	62.8	4.6
382	138.9	62.5	71.1	98.6	272.8	240.4	255.4	274.4	233.7	63.2	4.8
383	138.4	62.4	71.1	108.3	275.8	244.4	260.4	274.3	238.0	63.2	5.0
384	137.5	62.4	71.0	111.1	277.9	247.2	263.7	274.2	240.7	63.0	4.7
385	139.4	62.3	70.9	113.2	279.9	249.7	266.4	274.3	243.1	62.8	4.5
386	139.4	62.9	71.0	90.2	271.0	237.9	251.0	274.3	230.5	63.2	4.7
387	138.0	62.4	71.1	105.3	273.8	242.7	257.4	274.3	236.6	63.1	4.9
388	138.4	62.3	71.0	109.9	276.1	245.6	261.1	274.2	239.7	63.0	4.7
389	139.3	62.3	71.0	112.3	278.1	248.3	264.0	274.1	242.1	62.9	4.5
390	139.8	62.3	70.9	92.3	274.3	242.7	256.0	274.1	235.5	63.3	4.6
391	138.1	62.6	71.1	100.2	271.5	240.2	253.9	274.2	234.4	63.1	4.9

Appendix F 10 hours break-in period (page 21 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
392	138.0	62.3	71.1	108.4	274.1	244.0	258.5	274.1	238.2	63.0	4.6
393	138.2	62.4	70.9	111.2	276.2	246.7	261.6	273.9	240.8	62.8	4.4
394	138.9	62.0	70.9	115.5	278.1	249.0	263.7	273.9	242.9	62.9	4.4
395	138.5	62.7	70.9	92.1	268.7	236.9	249.5	273.9	230.4	63.0	4.8
396	137.1	62.5	71.0	105.8	272.0	242.1	255.4	273.9	236.6	62.9	4.6
397	137.3	62.3	70.9	109.8	274.2	245.0	259.2	273.7	239.5	62.8	4.4
398	138.5	62.3	70.9	112.1	276.1	247.5	262.0	273.5	241.8	62.5	4.3
399	140.1	62.2	70.8	92.6	272.9	242.7	254.9	273.6	236.2	63.1	4.7
400	138.3	62.6	70.9	99.4	269.2	239.2	251.6	273.6	234.0	63.0	4.5
401	137.9	62.4	70.9	108.2	271.9	243.0	256.1	273.4	237.9	62.8	4.3
402	138.8	62.2	70.8	110.8	273.8	245.7	259.2	273.3	240.4	63.1	4.2
403	138.0	62.2	70.8	112.9	275.8	248.1	261.7	273.2	242.6	63.3	4.7
404	139.2	62.8	70.7	90.3	267.3	236.9	247.3	273.2	230.4	63.0	4.5
405	137.9	62.4	70.9	105.5	270.2	241.6	253.6	273.2	236.5	62.9	4.3
406	137.5	62.3	70.8	109.8	272.4	244.5	257.3	273.0	239.4	62.3	4.0
407	138.5	62.2	70.8	112.1	274.4	247.0	259.9	272.9	241.6	63.7	4.4
408	139.5	62.2	70.7	91.8	270.0	240.9	251.8	273.0	234.6	63.2	4.5
409	136.7	62.5	70.9	99.9	267.4	238.8	249.9	272.9	233.8	62.9	4.2
410	137.5	62.4	70.9	108.1	270.0	242.5	254.5	272.7	237.6	62.7	4.0
411	137.3	62.2	70.8	110.6	272.0	245.0	257.5	272.5	240.0	63.3	4.3
412	138.8	62.2	70.7	112.8	273.9	247.3	259.9	272.5	242.1	63.0	4.4
413	137.5	62.9	70.7	90.0	265.9	236.5	246.1	272.5	230.4	62.9	4.1
414	136.5	62.4	70.9	103.8	267.5	239.9	250.7	272.4	235.0	62.8	3.9
415	135.7	62.3	70.8	108.9	269.7	242.9	254.5	272.2	237.9	63.1	4.2
416	137.4	62.1	70.7	111.3	271.6	245.4	257.2	272.0	240.1	63.0	4.3
417	138.2	61.9	70.6	98.9	272.2	245.6	255.8	272.0	239.7	62.9	4.1
418	137.2	62.6	70.8	95.6	264.9	236.9	247.0	272.0	231.2	62.8	3.8
419	136.9	62.4	70.8	106.9	268.0	241.3	251.9	271.9	236.2	63.4	4.1
420	138.1	62.3	70.7	110.1	270.0	243.9	255.1	271.7	238.7	63.0	4.3
421	138.7	62.2	70.7	112.3	271.8	246.3	257.4	271.6	240.8	62.9	4.0
422	138.8	62.5	70.6	91.0	266.4	238.8	247.5	271.6	232.2	62.8	3.8
423	137.0	62.3	70.8	102.2	265.7	239.1	248.6	271.5	234.0	62.9	4.0

Appendix F 10 hours break-in period (page 22 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
424	136.6	62.2	70.7	108.7	268.2	242.3	252.5	271.3	237.0	62.9	4.2
425	138.0	62.1	70.6	111.0	270.0	244.7	255.3	271.1	239.2	62.9	4.0
426	138.5	61.9	70.6	113.6	271.9	246.7	256.8	271.1	241.0	62.8	3.7
427	138.3	62.5	70.6	92.9	263.2	235.6	244.3	271.1	229.5	63.4	3.9
428	136.8	62.4	70.8	106.3	266.3	240.5	249.5	270.9	235.0	63.0	4.2
429	134.4	62.2	70.7	109.6	268.3	243.1	252.9	270.7	237.4	62.9	3.9
430	136.6	62.2	70.6	111.7	270.3	245.3	255.4	270.5	239.5	62.7	3.7
431	138.3	61.9	70.5	95.4	269.8	243.7	251.8	270.6	237.1	63.7	3.8
432	136.9	62.5	70.7	97.6	263.8	237.1	245.4	270.5	231.1	63.0	4.1
433	135.4	62.3	70.7	107.4	266.6	241.0	249.8	270.4	235.2	62.9	3.8
434	137.2	62.2	70.6	110.4	268.6	243.6	253.0	270.2	237.5	62.7	3.6
435	137.3	62.3	70.6	112.4	270.4	245.8	255.3	270.1	239.5	63.0	3.8
436	137.8	63.3	70.5	90.5	263.9	237.1	243.9	270.0	229.5	63.1	4.0
437	135.8	62.4	70.7	103.2	264.5	238.8	246.7	270.0	232.6	63.0	3.8
438	135.5	62.2	70.6	108.7	266.7	241.8	250.3	269.8	235.5	62.7	3.5
439	136.4	62.1	70.5	110.9	268.5	244.1	252.9	269.6	237.5	63.2	3.7
440	137.2	62.1	70.5	112.7	270.3	246.4	255.0	269.5	239.4	63.0	4.0
441	137.0	62.7	70.5	90.3	261.6	234.8	241.2	269.5	227.0	62.8	3.7
442	135.2	62.3	70.7	105.0	264.5	239.4	247.0	269.4	232.9	62.7	3.5
443	135.9	62.1	70.6	109.2	266.5	242.1	250.3	269.1	235.4	63.0	3.6
444	135.8	62.0	70.5	111.3	268.3	244.3	252.7	269.0	237.3	62.9	3.9
445	136.5	61.7	70.4	97.7	268.5	243.9	250.7	269.0	236.5	62.9	3.6
446	136.6	62.4	70.6	95.7	261.5	235.6	242.5	269.0	228.5	62.7	3.4
447	134.4	62.1	70.6	106.7	264.4	239.9	247.0	268.8	233.0	63.1	3.5
448	134.9	62.2	70.5	109.7	266.3	242.4	250.2	268.6	235.3	63.1	3.8
449	136.0	62.1	70.4	111.7	267.9	244.6	252.5	268.5	237.1	62.8	3.6
450	136.8	61.9	70.4	92.5	265.2	240.1	246.2	268.5	231.8	62.8	3.3
451	136.6	62.3	70.5	99.0	261.5	236.7	243.0	268.4	229.3	63.1	3.4
452	135.8	62.2	70.6	107.5	264.0	240.3	247.2	268.2	232.9	62.9	3.7
453	136.2	62.1	70.5	110.1	265.7	242.6	249.9	268.0	235.0	62.8	3.5
454	136.4	62.0	70.4	112.0	267.4	244.8	252.1	267.9	236.8	62.6	3.2
455	136.9	62.8	70.4	90.7	262.3	237.1	242.4	267.9	228.2	63.0	3.3

Appendix F 10 hours break-in period (page 23 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
456	135.5	62.3	70.5	101.7	261.3	237.3	243.2	267.8	229.6	63.0	3.7
457	135.7	62.2	70.5	107.9	263.5	240.4	246.9	267.5	232.5	62.9	3.4
458	136.3	62.0	70.4	110.3	265.2	242.8	249.4	267.3	234.6	62.7	3.2
459	136.1	62.0	70.4	112.2	266.7	245.0	251.7	267.2	236.3	62.8	3.1
460	146.1	63.0	72.5	93.8	300.1	269.8	254.3	286.7	241.8	63.0	3.6
461	144.9	62.9	72.6	108.4	304.3	277.0	262.0	286.8	249.7	62.9	3.4
462	145.3	62.7	72.4	112.5	306.8	281.2	267.1	286.7	253.7	62.7	3.1
463	146.1	62.9	72.2	97.4	306.7	280.5	265.5	286.8	252.7	62.9	3.0
464	144.7	63.5	72.5	91.8	296.7	267.8	253.6	286.9	241.2	63.5	3.5
465	142.8	63.1	72.5	107.3	300.5	275.0	261.9	287.0	249.5	63.1	3.4
466	144.9	62.8	72.4	112.3	303.2	279.2	266.9	286.9	253.6	62.8	3.1
467	145.1	62.4	72.2	120.0	305.6	282.6	270.7	286.9	257.0	62.4	2.9
468	145.9	62.9	72.3	91.0	294.9	267.9	254.5	287.1	242.7	62.9	3.2
469	144.7	62.9	72.5	105.7	297.3	273.3	261.3	287.1	249.5	62.9	3.3
470	145.0	62.8	72.3	111.5	300.0	277.5	266.5	287.0	253.6	62.8	3.1
471	144.4	62.6	72.2	114.6	302.4	280.9	270.5	287.0	257.0	62.6	2.9
472	144.2	63.1	72.1	91.3	292.9	267.6	255.5	287.1	243.7	63.1	3.1
473	142.7	63.0	72.4	104.6	294.2	271.3	260.3	287.2	248.9	63.0	3.3
474	142.0	62.8	72.2	111.1	297.0	275.5	265.6	287.0	253.1	62.8	3.0
475	144.1	62.7	72.2	114.2	299.3	278.8	269.6	287.0	256.3	62.7	2.8
476	144.0	63.0	72.1	92.1	292.4	268.6	257.9	287.0	246.0	63.0	3.0
477	141.5	62.8	72.3	102.1	291.0	268.3	258.8	287.0	247.6	62.8	3.2
478	142.6	62.8	72.2	110.2	294.1	272.8	264.4	286.9	252.2	62.8	3.0
479	143.4	62.7	72.1	113.5	296.5	276.2	268.5	286.8	255.4	62.7	2.8
480	144.4	62.5	72.0	92.6	291.4	268.4	259.3	286.8	247.2	62.5	2.8
481	142.8	62.8	72.2	100.8	288.6	266.1	258.1	286.7	246.7	62.8	3.1
482	142.0	62.7	72.2	109.9	291.7	270.7	263.7	286.6	251.4	62.7	2.9
483	142.9	62.7	72.0	113.2	294.1	274.1	267.9	286.4	254.6	62.7	2.7
484	143.6	62.5	71.9	93.8	291.2	268.9	261.6	286.3	249.0	62.5	2.7
485	142.0	62.8	72.1	98.6	286.2	263.4	256.9	286.3	245.1	62.8	3.1
486	140.8	62.7	72.1	109.0	289.6	268.4	262.8	286.1	250.4	62.7	2.9
487	141.4	62.6	72.0	112.4	292.0	271.8	266.9	285.9	253.7	62.6	2.7

Appendix F 10 hours break-in period (page 24 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
488	142.9	62.4	71.8	95.7	291.2	269.5	263.5	285.8	251.0	62.4	2.6
489	142.1	62.8	72.0	95.7	283.6	260.3	255.1	285.7	243.0	62.8	3.0
490	140.4	62.7	72.1	108.4	287.3	266.0	261.3	285.6	249.2	62.7	2.8
491	141.4	62.5	71.9	112.1	289.8	269.3	265.7	285.3	252.5	62.5	2.6
492	141.3	62.4	71.8	106.3	291.8	271.3	266.9	285.2	254.2	62.4	2.4
493	141.8	62.9	71.8	92.4	282.0	257.9	253.6	285.1	241.1	62.9	2.9
494	140.8	62.7	72.0	107.3	285.8	264.1	260.6	284.9	248.3	62.7	2.8
495	141.3	62.5	71.9	111.6	288.4	267.4	265.0	284.6	251.7	62.5	2.6
496	142.0	62.3	71.7	116.3	290.8	270.3	268.4	284.4	254.4	62.3	2.4
497	141.7	63.6	71.8	90.8	280.8	256.4	252.5	284.4	240.3	63.6	2.8
498	141.3	62.8	72.0	106.4	284.2	262.1	259.8	284.2	247.4	62.8	2.8
499	141.0	62.6	71.8	111.2	286.8	265.5	264.1	283.9	250.8	62.6	2.6
500	142.8	62.4	71.7	113.7	289.2	268.3	267.6	283.7	253.5	62.4	2.4
501	142.6	63.7	71.7	91.5	281.9	257.5	254.8	283.7	242.2	63.7	2.5
502	141.0	62.7	72.0	104.2	282.7	259.8	258.2	283.5	245.9	62.7	2.7
503	140.9	62.6	71.8	110.4	285.6	263.4	262.9	283.2	249.6	62.6	2.5
504	141.5	62.5	71.7	113.5	288.0	266.3	266.6	283.0	252.3	62.5	2.3
505	142.2	62.6	71.6	92.3	283.1	258.5	257.1	282.9	243.7	62.6	2.4
506	140.9	62.8	71.8	101.4	281.1	257.2	256.5	282.8	244.0	62.8	2.7
507	140.3	62.6	71.8	109.7	284.3	261.3	261.7	282.6	248.1	62.6	2.5
508	140.9	62.5	71.7	112.7	286.7	264.2	265.3	282.3	250.9	62.5	2.3
509	141.9	62.2	71.5	93.8	284.4	260.0	259.4	282.2	246.0	62.2	2.3
510	140.7	62.6	71.8	98.2	279.4	254.2	254.3	282.1	241.6	62.6	2.7
511	140.2	62.6	71.7	108.8	282.8	259.1	260.0	281.8	246.6	62.6	2.5
512	140.6	62.5	71.7	111.9	285.2	262.0	263.8	281.5	249.5	62.5	2.3
513	142.2	62.1	71.5	112.3	287.4	264.4	265.9	281.4	251.7	62.1	2.1
514	142.0	63.0	71.6	91.3	277.3	250.5	250.8	281.3	237.6	63.0	2.6
515	140.9	62.7	71.7	106.6	281.0	256.4	258.0	281.1	244.8	62.7	2.5
516	140.2	62.5	71.6	111.1	283.5	259.9	262.3	280.8	248.0	62.5	2.3
517	139.9	62.4	71.5	113.5	285.8	262.5	265.7	280.6	250.5	62.4	2.1
518	141.9	63.3	71.5	91.2	278.9	252.3	253.4	280.5	239.6	63.3	2.3
519	139.5	62.6	71.7	102.9	279.0	253.6	255.9	280.4	242.4	62.6	2.5

Appendix F 10 hours break-in period (page 25 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
520	140.1	62.5	71.6	109.8	281.8	257.3	260.8	280.1	246.2	62.5	2.3
521	140.1	62.5	71.5	112.4	284.0	260.1	264.4	279.8	248.8	62.5	2.1
522	141.3	62.2	71.4	93.2	281.3	255.4	258.0	279.7	243.1	62.2	2.1
523	139.0	62.7	71.5	99.6	277.5	251.4	254.8	279.6	240.6	62.7	2.4
524	139.3	62.6	71.5	109.1	280.6	255.6	260.1	279.3	245.1	62.6	2.2
525	140.0	62.4	71.4	112.0	282.9	258.4	263.7	279.1	247.9	62.4	2.1
526	141.9	62.3	71.4	100.6	284.1	259.0	263.1	279.0	248.0	62.3	1.9
527	140.7	62.8	71.4	92.9	275.1	247.6	251.8	278.9	236.8	62.8	2.4
528	139.1	62.7	71.5	107.2	278.7	253.2	258.2	278.7	243.3	62.7	2.2
529	140.1	62.4	71.5	111.1	281.3	256.4	262.4	278.4	246.3	62.4	2.1
530	139.8	62.4	71.3	113.5	283.4	259.0	265.6	278.3	248.7	62.4	1.9
531	140.7	63.0	71.3	90.7	275.5	247.7	251.9	278.2	236.9	63.0	2.1
532	139.2	62.7	71.5	104.9	277.4	251.3	256.9	278.0	241.9	62.7	2.2
533	139.3	62.5	71.4	110.3	280.1	254.7	261.4	277.8	245.1	62.5	2.0
534	139.0	62.3	71.3	112.7	282.3	257.4	264.7	277.6	247.6	62.3	1.9
535	140.2	62.7	71.2	92.1	277.7	250.3	255.7	277.6	239.5	62.7	2.0
536	138.5	62.7	71.4	100.3	275.3	248.4	254.6	277.5	239.1	62.7	2.2
537	138.6	62.5	71.3	108.9	278.3	252.4	259.8	277.2	243.2	62.5	2.0
538	137.6	62.4	71.2	111.7	280.6	255.2	263.4	277.0	245.8	62.4	1.9
539	139.7	62.3	71.2	102.8	282.2	256.2	263.5	276.9	246.6	62.3	1.7
540	138.8	62.7	71.3	93.8	273.5	245.4	252.5	276.9	235.6	62.7	2.2
541	138.0	62.6	71.3	107.5	277.1	250.6	258.5	276.7	241.7	62.6	2.0
542	139.2	62.4	71.3	111.0	279.5	253.6	262.7	276.5	244.6	62.4	1.8
543	140.1	62.4	71.2	113.3	281.8	256.2	265.6	276.4	246.9	62.4	1.7
544	140.3	63.2	71.2	90.9	274.3	245.5	252.5	276.4	235.5	63.2	1.9
545	138.7	62.6	71.4	104.4	275.8	248.5	257.0	276.3	239.9	62.6	2.0
546	139.2	62.5	71.3	110.1	278.4	251.9	261.3	276.1	243.1	62.5	1.8
547	138.9	62.2	71.3	112.5	280.7	254.5	264.6	276.0	245.6	62.2	1.7
548	140.6	62.8	71.1	92.7	277.1	248.8	257.3	276.0	239.1	62.8	1.7
549	139.6	62.7	71.4	100.3	274.2	246.1	255.2	275.9	237.8	62.7	2.0
550	138.8	62.5	71.4	108.9	277.2	250.1	260.2	275.8	241.8	62.5	1.8
551	140.3	62.4	71.2	111.6	279.4	252.8	263.7	275.6	244.4	62.4	1.7

Appendix F 10 hours break-in period (page 26 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
552	140.1	62.0	71.2	106.0	281.3	254.4	264.7	275.6	245.5	62.0	1.5
553	139.7	63.1	71.3	91.6	271.7	242.2	251.1	275.6	232.8	63.1	2.0
554	139.0	62.6	71.4	106.5	275.3	247.6	257.8	275.5	239.5	62.6	1.9
555	139.0	62.4	71.2	110.4	277.7	250.6	261.9	275.3	242.4	62.4	1.7
556	139.5	62.3	71.2	112.9	280.1	253.2	265.1	275.2	244.9	62.3	1.6
557	139.9	63.0	71.1	91.4	274.4	245.0	254.5	275.3	235.5	63.0	1.7
558	138.7	62.9	71.4	102.7	274.1	245.6	256.1	275.2	237.7	62.9	1.9
559	138.8	62.6	71.3	109.4	276.9	249.1	260.8	275.1	241.2	62.6	1.7
560	139.5	62.4	71.1	112.2	279.2	251.8	264.2	275.0	243.7	62.4	1.5
561	140.3	62.6	71.1	94.1	277.7	248.8	259.4	275.0	239.6	62.6	1.5
562	139.7	62.6	71.2	98.1	272.7	243.2	254.3	275.0	235.1	62.6	1.9
563	138.4	62.4	71.3	108.3	275.9	247.5	259.5	274.9	239.7	62.4	1.7
564	140.4	62.4	71.2	111.2	278.3	250.3	263.3	274.8	242.4	62.4	1.5
565	139.6	62.2	71.1	116.3	280.6	252.9	266.3	274.8	244.7	62.2	1.4
566	139.8	62.8	71.1	91.2	271.5	240.4	251.5	274.8	231.7	62.8	1.8
567	139.1	62.6	71.3	106.0	275.2	245.8	258.3	274.7	238.3	62.6	1.7
568	139.1	62.5	71.2	110.4	277.8	248.7	262.3	274.6	241.2	62.5	1.5
569	139.5	62.3	71.1	112.7	280.1	251.4	265.6	274.5	243.6	62.3	1.4
570	140.9	62.8	71.0	91.9	275.6	244.5	256.3	274.6	235.5	62.8	1.4
571	139.7	62.6	71.2	101.5	274.2	243.6	256.3	274.7	236.1	62.6	1.7
572	139.4	62.5	71.3	109.2	277.2	247.2	261.2	274.6	239.9	62.5	1.5
573	139.4	62.3	71.1	111.8	279.5	250.0	264.8	274.5	242.4	62.3	1.4
574	140.6	62.1	71.1	95.8	279.4	248.5	261.8	274.6	240.5	62.1	1.3
575	139.6	62.7	71.1	94.8	272.2	240.0	253.5	274.6	232.5	62.7	1.7
576	138.1	62.5	71.2	107.0	275.9	245.0	259.6	274.5	237.9	62.5	1.5
577	137.2	62.4	71.1	110.4	278.3	247.9	263.5	274.4	240.8	62.4	1.4
578	139.5	62.2	71.0	112.7	280.7	250.5	266.8	274.3	243.1	62.2	1.2
579	139.2	63.1	71.0	91.0	274.7	241.9	255.6	274.4	233.4	63.1	1.3
580	138.6	62.6	71.2	102.8	274.8	243.0	257.8	274.4	236.0	62.6	1.5
581	139.7	62.4	71.1	109.3	277.6	246.4	262.5	274.4	239.5	62.4	1.4
582	139.9	62.4	71.0	111.9	279.9	249.1	266.0	274.3	241.9	62.4	1.2
583	140.0	62.3	70.9	95.6	279.7	247.6	262.6	274.4	239.7	62.3	1.1

Appendix F 10 hours break-in period (page 27 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
584	139.2	62.6	71.1	96.3	273.1	240.1	255.2	274.4	233.0	62.6	1.5
585	137.9	62.5	71.1	107.7	276.6	244.7	260.9	274.4	238.0	62.5	1.4
586	139.1	62.4	71.0	110.9	279.0	247.6	264.6	274.3	240.7	62.4	1.2
587	139.0	62.3	71.0	113.2	281.2	250.0	267.6	274.3	243.0	62.3	1.1
588	139.9	62.9	71.0	90.1	272.3	238.3	252.6	274.4	230.4	62.9	1.4
589	139.1	62.5	71.1	105.3	275.1	243.0	259.3	274.3	236.5	62.5	1.4
590	138.7	62.5	71.1	109.8	277.5	246.2	263.2	274.3	239.5	62.5	1.2
591	139.1	62.3	71.0	112.4	279.6	248.7	266.3	274.2	241.9	62.3	1.1
592	139.1	62.1	70.9	93.6	277.6	245.1	260.4	274.3	237.5	62.1	1.0
593	138.9	62.5	71.1	98.6	272.8	240.4	255.4	274.4	233.7	62.5	1.4
594	138.4	62.4	71.1	108.3	275.8	244.4	260.4	274.3	238.0	62.4	1.2
595	137.5	62.4	71.0	111.1	277.9	247.2	263.7	274.2	240.7	62.4	1.1
596	139.4	62.3	70.9	113.2	279.9	249.7	266.4	274.3	243.1	62.3	0.9
597	139.4	62.9	71.0	90.2	271.0	237.9	251.0	274.3	230.5	62.9	1.3
598	138.0	62.4	71.1	105.3	273.8	242.7	257.4	274.3	236.6	62.4	1.3
599	138.4	62.3	71.0	109.9	276.1	245.6	261.1	274.2	239.7	62.3	1.1
600	139.3	62.3	71.0	112.3	278.1	248.3	264.0	274.1	242.1	62.3	0.9
601	139.8	62.3	70.9	92.3	274.3	242.7	256.0	274.1	235.5	62.3	1.0
602	138.1	62.6	71.1	100.2	271.5	240.2	253.9	274.2	234.4	62.6	1.3
603	138.0	62.3	71.1	108.4	274.1	244.0	258.5	274.1	238.2	62.3	1.1
604	138.2	62.4	70.9	111.2	276.2	246.7	261.6	273.9	240.8	62.4	0.9
605	138.9	62.0	70.9	115.5	278.1	249.0	263.7	273.9	242.9	62.0	0.8
606	138.5	62.7	70.9	92.1	268.7	236.9	249.5	273.9	230.4	62.7	1.2
607	137.1	62.5	71.0	105.8	272.0	242.1	255.4	273.9	236.6	62.5	1.1
608	137.3	62.3	70.9	109.8	274.2	245.0	259.2	273.7	239.5	62.3	1.0
609	138.5	62.3	70.9	112.1	276.1	247.5	262.0	273.5	241.8	62.3	0.8
610	140.1	62.2	70.8	92.6	272.9	242.7	254.9	273.6	236.2	62.2	0.8
611	138.3	62.6	70.9	99.4	269.2	239.2	251.6	273.6	234.0	62.6	1.1
612	137.9	62.4	70.9	108.2	271.9	243.0	256.1	273.4	237.9	62.4	1.0
613	138.8	62.2	70.8	110.8	273.8	245.7	259.2	273.3	240.4	62.2	0.8
614	138.0	62.2	70.8	112.9	275.8	248.1	261.7	273.2	242.6	62.2	0.7
615	139.2	62.8	70.7	90.3	267.3	236.9	247.3	273.2	230.4	62.8	1.1

Appendix F 10 hours break-in period (page 28 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
616	137.9	62.4	70.9	105.5	270.2	241.6	253.6	273.2	236.5	62.4	1.0
617	137.5	62.3	70.8	109.8	272.4	244.5	257.3	273.0	239.4	62.3	0.8
618	138.5	62.2	70.8	112.1	274.4	247.0	259.9	272.9	241.6	62.2	0.7
619	139.5	62.2	70.7	91.8	270.0	240.9	251.8	273.0	234.6	62.2	0.7
620	136.7	62.5	70.9	99.9	267.4	238.8	249.9	272.9	233.8	62.5	1.0
621	137.5	62.4	70.9	108.1	270.0	242.5	254.5	272.7	237.6	62.4	0.9
622	137.3	62.2	70.8	110.6	272.0	245.0	257.5	272.5	240.0	62.2	0.7
623	138.8	62.2	70.7	112.8	273.9	247.3	259.9	272.5	242.1	62.2	0.6
624	137.5	62.9	70.7	90.0	265.9	236.5	246.1	272.5	230.4	62.9	0.8
625	136.5	62.4	70.9	103.8	267.5	239.9	250.7	272.4	235.0	62.4	0.9
626	135.7	62.3	70.8	108.9	269.7	242.9	254.5	272.2	237.9	62.3	0.8
627	137.4	62.1	70.7	111.3	271.6	245.4	257.2	272.0	240.1	62.1	0.6
628	138.2	61.9	70.6	98.9	272.2	245.6	255.8	272.0	239.7	61.9	0.5
629	137.2	62.6	70.8	95.6	264.9	236.9	247.0	272.0	231.2	62.6	0.9
630	136.9	62.4	70.8	106.9	268.0	241.3	251.9	271.9	236.2	62.4	0.8
631	138.1	62.3	70.7	110.1	270.0	243.9	255.1	271.7	238.7	62.3	0.6
632	138.7	62.2	70.7	112.3	271.8	246.3	257.4	271.6	240.8	62.2	0.5
633	138.8	62.5	70.6	91.0	266.4	238.8	247.5	271.6	232.2	62.5	0.6
634	137.0	62.3	70.8	102.2	265.7	239.1	248.6	271.5	234.0	62.3	0.8
635	136.6	62.2	70.7	108.7	268.2	242.3	252.5	271.3	237.0	62.2	0.6
636	138.0	62.1	70.6	111.0	270.0	244.7	255.3	271.1	239.2	62.1	0.5
637	138.5	61.9	70.6	113.6	271.9	246.7	256.8	271.1	241.0	61.9	0.4
638	138.3	62.5	70.6	92.9	263.2	235.6	244.3	271.1	229.5	62.5	0.8
639	136.8	62.4	70.8	106.3	266.3	240.5	249.5	270.9	235.0	62.4	0.7
640	134.4	62.2	70.7	109.6	268.3	243.1	252.9	270.7	237.4	62.2	0.5
641	136.6	62.2	70.6	111.7	270.3	245.3	255.4	270.5	239.5	62.2	0.4
642	138.3	61.9	70.5	95.4	269.8	243.7	251.8	270.6	237.1	61.9	0.3
643	136.9	62.5	70.7	97.6	263.8	237.1	245.4	270.5	231.1	62.5	0.7
644	135.4	62.3	70.7	107.4	266.6	241.0	249.8	270.4	235.2	62.3	0.6
645	137.2	62.2	70.6	110.4	268.6	243.6	253.0	270.2	237.5	62.2	0.4
646	137.3	62.3	70.6	112.4	270.4	245.8	255.3	270.1	239.5	62.3	0.3
647	137.8	63.3	70.5	90.5	263.9	237.1	243.9	270.0	229.5	63.3	0.4

Appendix F 10 hours break-in period (page 29 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
648	135.8	62.4	70.7	103.2	264.5	238.8	246.7	270.0	232.6	62.4	0.6
649	135.5	62.2	70.6	108.7	266.7	241.8	250.3	269.8	235.5	62.2	0.5
650	136.4	62.1	70.5	110.9	268.5	244.1	252.9	269.6	237.5	62.1	0.3
651	137.2	62.1	70.5	112.7	270.3	246.4	255.0	269.5	239.4	62.1	0.2
652	137.0	62.7	70.5	90.3	261.6	234.8	241.2	269.5	227.0	62.7	0.6
653	135.2	62.3	70.7	105.0	264.5	239.4	247.0	269.4	232.9	62.3	0.5
654	135.9	62.1	70.6	109.2	266.5	242.1	250.3	269.1	235.4	62.1	0.4
655	135.8	62.0	70.5	111.3	268.3	244.3	252.7	269.0	237.3	62.0	0.3
656	136.5	61.7	70.4	97.7	268.5	243.9	250.7	269.0	236.5	61.7	0.2
657	136.6	62.4	70.6	95.7	261.5	235.6	242.5	269.0	228.5	62.4	0.6
658	134.4	62.1	70.6	106.7	264.4	239.9	247.0	268.8	233.0	62.1	0.4
659	134.9	62.2	70.5	109.7	266.3	242.4	250.2	268.6	235.3	62.2	0.3
660	136.0	62.1	70.4	111.7	267.9	244.6	252.5	268.5	237.1	62.1	0.2
661	136.8	61.9	70.4	92.5	265.2	240.1	246.2	268.5	231.8	61.9	0.2
662	136.6	62.3	70.5	99.0	261.5	236.7	243.0	268.4	229.3	62.3	0.5
663	135.8	62.2	70.6	107.5	264.0	240.3	247.2	268.2	232.9	62.2	0.4
664	136.2	62.1	70.5	110.1	265.7	242.6	249.9	268.0	235.0	62.1	0.2
665	136.4	62.0	70.4	112.0	267.4	244.8	252.1	267.9	236.8	62.0	0.1
666	136.9	62.8	70.4	90.7	262.3	237.1	242.4	267.9	228.2	62.8	0.2
667	135.5	62.3	70.5	101.7	261.3	237.3	243.2	267.8	229.6	62.3	0.4
668	135.7	62.2	70.5	107.9	263.5	240.4	246.9	267.5	232.5	62.2	0.3
669	136.3	62.0	70.4	110.3	265.2	242.8	249.4	267.3	234.6	62.0	0.1
670	136.1	62.0	70.4	112.2	266.7	245.0	251.7	267.2	236.3	62.0	0.0

January 15th, 2015

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	scale
1	380.3	66.1	154.5	101.1	442.8	300.7	372.3	390.3	315.9	66.1	18.3
2	391.8	66.1	155.3	101.2	442.4	300.6	365.7	394.3	317.3	66.1	31.5
3	443.0	66.1	150.7	103.7	478.7	301.0	359.4	397.8	318.4	66.1	30.9
4	484.8	65.7	153.1	107.3	535.7	301.6	353.6	400.9	319.1	65.7	30.3

Appendix F 10 hours break-in period (page 30 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
5	513.8	65.7	157.1	110.8	589.7	302.1	348.4	403.5	319.5	65.7	29.7
6	534.4	64.9	161.3	114.0	641.4	302.2	343.7	405.5	319.4	64.9	29.0
7	549.6	63.8	165.3	116.1	686.1	301.9	339.5	407.0	319.0	63.8	28.4
8	561.9	64.4	169.0	118.7	726.2	301.6	336.3	408.1	318.3	64.4	27.9
9	569.0	65.6	172.3	121.9	760.2	301.7	334.1	408.9	317.8	65.6	27.4
10	576.4	66.2	174.8	120.7	787.6	299.1	329.7	409.6	314.6	66.2	26.8
11	578.9	64.7	176.2	120.0	808.5	294.5	323.5	409.8	309.6	64.7	26.3
12	579.2	67.0	177.0	121.0	822.5	290.9	319.9	409.8	305.6	67.0	25.9
13	578.9	66.4	178.0	120.8	832.9	287.9	317.1	409.6	302.2	66.4	25.4
14	578.7	66.9	178.3	121.1	841.8	285.3	316.8	409.2	299.2	66.9	25.0
15	578.3	65.7	179.1	120.7	849.2	283.0	316.2	408.7	296.2	65.7	24.5
16	574.7	67.7	179.5	121.3	853.9	280.8	316.0	408.1	293.4	67.7	24.0
17	572.1	67.8	179.7	121.0	857.2	279.2	316.0	407.3	290.8	67.8	23.6
18	569.7	67.8	179.5	120.9	859.5	277.9	316.1	406.5	288.6	67.8	23.1
19	568.4	67.0	179.1	120.9	860.9	276.9	316.3	405.5	286.2	67.0	22.6
20	567.9	66.6	178.8	120.7	861.4	276.3	316.5	404.5	284.3	66.6	22.2
21	565.3	67.0	178.6	121.0	861.4	276.0	317.2	403.4	282.6	67.0	21.8
22	562.7	66.3	178.2	120.8	859.8	275.9	317.7	402.3	280.9	66.3	21.3
23	561.1	67.0	177.7	120.6	859.1	275.8	318.4	401.1	279.8	67.0	20.9
24	559.3	66.6	177.2	120.1	858.1	275.9	318.7	399.8	278.5	66.6	20.5
25	558.4	68.0	177.0	120.1	857.3	276.3	318.7	398.5	277.4	68.0	20.1
26	557.3	68.3	177.0	120.3	856.9	276.8	319.0	397.2	276.7	68.3	19.7
27	557.2	67.5	176.3	120.3	857.3	277.4	318.9	395.9	276.0	67.5	19.3
28	555.7	66.6	175.6	119.8	858.2	278.3	317.6	394.6	275.6	66.6	18.8
29	555.2	66.4	175.3	119.9	858.2	278.9	316.2	393.2	275.1	66.4	18.5
30	553.2	67.2	175.0	120.1	857.7	280.0	314.6	391.9	275.2	67.2	18.1
31	551.0	66.8	174.4	120.4	856.6	281.2	312.9	390.6	275.1	66.8	17.7
32	548.5	66.5	173.8	119.6	854.7	282.4	311.6	389.2	275.1	66.5	17.3
33	546.6	66.7	173.3	119.5	851.6	283.2	310.2	387.9	275.0	66.7	16.9
34	544.3	67.0	172.4	119.3	848.0	284.4	310.9	386.6	275.0	67.0	16.6
35	541.9	67.9	171.7	120.0	844.8	286.0	313.7	385.2	275.4	67.9	16.3
36	539.1	66.4	171.0	119.8	841.5	287.8	317.2	383.9	276.4	66.4	15.9

Appendix F 10 hours break-in period (page 31 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
37	536.2	67.3	169.8	119.4	837.4	289.3	320.2	382.6	277.2	67.3	15.6
38	534.1	66.3	169.2	119.1	832.8	291.1	322.3	381.3	278.2	66.3	15.2
39	530.0	66.5	168.2	118.8	828.2	292.9	324.1	380.1	279.1	66.5	14.9
40	524.8	67.7	167.3	118.8	821.5	294.3	324.5	378.9	280.1	67.7	14.6
41	522.0	66.5	166.0	118.4	814.5	295.8	323.7	377.7	280.9	66.5	14.3
42	519.2	66.6	164.8	117.7	808.3	297.4	322.8	376.5	282.0	66.6	14.0
43	517.4	66.0	164.3	120.2	806.8	300.6	325.2	375.3	285.2	66.0	13.7
44	519.8	65.6	163.6	121.5	812.0	305.9	329.1	374.2	290.2	65.6	13.5
45	517.2	66.2	162.5	122.1	813.7	310.1	330.6	373.1	294.2	66.2	13.2
46	514.6	66.0	161.3	119.0	809.5	312.2	328.7	372.2	295.5	66.0	12.8
47	509.8	67.3	160.3	117.8	799.7	311.6	324.1	371.3	294.5	67.3	12.6
48	504.4	66.4	158.8	116.8	791.3	311.8	320.5	370.3	294.4	66.4	12.3
49	499.2	66.1	158.1	118.5	784.6	313.9	318.4	369.4	296.4	66.1	12.1
50	495.9	66.4	156.6	119.4	781.5	318.1	317.9	368.4	300.1	66.4	11.9
51	493.7	65.9	155.5	119.1	776.6	321.6	316.6	367.5	302.8	65.9	11.7
52	491.7	66.0	154.1	119.1	772.0	325.0	315.5	366.6	305.2	66.0	11.5
53	489.5	65.3	153.5	118.8	765.5	327.6	314.4	365.9	307.0	65.3	11.2
54	487.9	65.3	152.3	118.2	760.3	330.5	313.6	365.3	308.7	65.3	11.1
55	486.6	65.8	152.1	118.4	753.9	332.8	312.6	364.7	310.1	65.8	10.8
56	484.1	65.3	151.1	118.1	747.3	335.0	311.7	364.1	311.5	65.3	10.6
57	481.2	65.7	150.2	118.0	738.2	336.8	311.2	363.6	312.7	65.7	10.4
58	477.4	65.6	149.6	117.3	728.2	338.4	310.7	363.1	313.6	65.6	10.2
59	474.3	66.0	148.2	117.3	719.4	339.7	310.0	362.7	314.4	66.0	10.0
60	470.1	65.5	147.3	116.8	708.9	341.2	309.3	362.2	315.4	65.5	9.8
61	466.2	65.5	146.0	116.3	698.0	342.1	308.9	361.8	316.0	65.5	9.6
62	461.6	65.6	145.2	115.7	686.9	342.8	308.6	361.2	316.8	65.6	9.4
63	458.7	65.3	144.3	115.2	677.4	343.5	308.8	360.8	317.5	65.3	9.2
64	455.2	65.5	143.2	114.7	667.7	343.9	308.5	360.3	318.1	65.5	9.0
65	451.9	65.4	142.3	114.3	659.2	343.9	308.5	359.8	318.5	65.4	8.9
66	449.7	66.0	141.5	114.0	651.4	343.9	308.5	359.3	319.0	66.0	8.7
67	447.2	65.5	140.9	113.6	644.9	344.1	308.7	358.9	319.3	65.5	8.5
68	446.2	65.3	139.9	113.1	638.8	343.9	308.6	358.4	319.6	65.3	8.3

Appendix F 10 hours break-in period (page 32 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
69	444.2	65.4	139.2	112.7	633.4	343.3	308.8	358.0	319.8	65.4	8.1
70	443.5	65.7	139.0	112.2	627.7	342.5	309.4	357.6	319.9	65.7	8.0
71	440.6	66.3	138.1	112.2	623.1	341.7	310.4	357.3	320.1	66.3	7.8
72	437.6	65.1	137.7	111.1	618.4	340.9	310.5	356.9	320.0	65.1	7.7
73	434.3	66.2	136.5	111.1	612.8	340.1	310.4	356.6	320.4	66.2	7.5
74	431.7	66.3	135.7	111.0	606.7	339.2	310.6	356.3	320.4	66.3	7.4
75	427.9	67.2	135.4	110.5	599.8	338.5	310.9	355.9	320.5	67.2	7.2
76	425.4	66.8	134.5	110.6	592.2	337.5	310.9	355.6	320.7	66.8	7.1
77	423.0	66.0	133.8	110.0	585.5	336.8	311.0	355.2	320.7	66.0	6.9
78	421.3	65.6	133.0	109.7	579.8	336.3	311.2	354.9	320.7	65.6	6.8
79	419.8	66.3	133.0	109.6	575.3	335.2	311.7	354.5	320.1	66.3	6.6
80	419.2	66.3	132.0	109.3	572.0	334.6	312.3	354.1	319.9	66.3	6.5
81	418.7	66.0	131.7	108.9	569.5	333.8	313.1	353.7	319.8	66.0	6.3
82	415.9	66.1	131.0	108.8	565.8	332.9	313.6	353.3	319.5	66.1	6.2
83	413.2	66.2	130.4	108.3	561.6	332.2	315.2	352.8	319.3	66.2	6.1
84	410.9	66.0	129.7	108.3	557.2	331.3	317.1	352.3	319.1	66.0	6.0
85	406.7	65.9	129.0	107.8	552.7	330.4	318.7	351.9	318.7	65.9	5.9
86	404.4	65.4	128.5	107.3	547.3	329.6	320.3	351.4	318.6	65.4	5.7
87	401.3	66.2	127.5	106.9	541.7	328.6	322.1	350.9	318.1	66.2	5.6
88	398.9	66.1	126.8	106.5	536.2	327.5	323.5	350.4	317.7	66.1	5.5
89	395.9	65.8	126.3	106.2	530.9	326.5	325.0	349.9	317.2	65.8	5.4
90	392.2	66.0	125.3	105.8	524.7	325.6	326.2	349.4	316.9	66.0	5.3
91	389.3	66.0	124.7	105.4	519.2	324.6	327.4	348.8	316.6	66.0	5.2
92	386.5	66.1	123.9	105.0	514.0	323.6	328.9	348.3	316.3	66.1	5.1
93	382.4	66.1	122.9	104.3	508.6	322.5	330.1	347.8	316.0	66.1	5.0
94	379.8	66.1	122.3	104.0	503.2	321.3	331.1	347.2	315.5	66.1	4.9
95	377.3	65.9	121.5	103.6	498.2	319.9	331.7	346.7	315.0	65.9	4.8
96	375.0	65.6	120.9	103.2	493.2	318.8	333.1	346.2	314.4	65.6	4.7
97	371.3	66.2	119.9	102.8	486.9	317.3	334.2	345.7	314.1	66.2	4.7
98	367.3	65.8	119.5	102.5	480.4	316.0	335.2	345.2	313.7	65.8	4.6
99	364.4	66.3	118.7	102.1	474.6	314.6	336.3	344.7	313.1	66.3	4.5
100	361.9	65.7	117.8	101.5	469.1	313.4	337.7	344.2	312.7	65.7	4.4

Appendix F 10 hours break-in period (page 33 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
101	361.0	65.9	117.2	101.2	464.0	312.3	338.7	343.7	312.1	65.9	4.3
102	359.2	65.6	117.0	101.0	459.1	310.8	339.9	343.2	311.5	65.6	4.2
103	357.5	66.1	116.6	100.5	454.8	309.3	340.9	342.7	310.8	66.1	4.2
104	356.5	66.1	116.3	100.3	450.9	307.8	342.0	342.2	310.2	66.1	4.1
105	355.1	65.8	115.7	100.0	447.4	306.3	342.8	341.7	309.7	65.8	4.0
106	353.9	65.6	115.3	99.8	443.9	305.0	343.9	341.3	309.1	65.6	3.9
107	351.8	66.0	115.2	99.6	440.4	303.7	344.7	340.8	308.5	66.0	3.9
108	350.4	65.9	114.9	99.5	437.2	302.3	345.2	340.3	308.0	65.9	3.8
109	349.0	65.5	114.2	99.1	433.7	300.9	345.9	339.8	307.2	65.5	3.7
110	347.4	65.6	113.7	99.0	430.8	299.6	346.4	339.3	306.5	65.6	3.7
111	346.0	65.9	113.2	98.7	427.5	298.2	347.0	338.8	306.1	65.9	3.6
112	344.4	65.7	112.9	98.6	424.4	296.9	347.9	338.3	305.6	65.7	3.5
113	342.7	65.6	112.4	98.4	421.1	295.7	348.9	337.8	305.1	65.6	3.4
114	340.6	65.5	112.2	97.9	417.7	294.5	349.2	337.2	304.5	65.5	3.3
115	338.0	65.6	111.8	97.8	413.9	293.1	349.6	336.7	303.7	65.6	3.3
116	335.0	65.5	111.4	97.5	409.9	291.6	349.2	336.2	302.8	65.5	3.2
117	332.7	65.8	111.0	97.1	405.7	290.5	349.0	335.7	302.1	65.8	3.2
118	330.6	65.8	110.3	97.0	401.7	289.2	349.1	335.2	301.3	65.8	3.1
119	327.4	65.7	109.6	96.4	397.3	288.0	348.9	334.8	300.4	65.7	3.0
120	324.4	65.5	109.1	96.0	393.4	286.7	348.7	334.2	299.4	65.5	3.0
121	322.3	65.7	108.8	95.9	389.4	285.4	347.8	333.8	298.4	65.7	2.9
122	320.7	65.7	108.4	95.7	385.3	284.2	346.8	333.2	297.4	65.7	2.9
123	318.4	65.6	108.1	95.4	381.6	282.9	346.0	332.7	296.3	65.6	2.8
124	316.7	65.8	107.6	94.9	378.1	281.5	345.2	332.3	294.9	65.8	2.8
125	315.3	65.5	107.1	94.8	375.1	280.1	344.4	331.8	293.8	65.5	2.7
126	314.3	65.9	107.0	94.6	372.0	278.9	343.1	331.3	292.4	65.9	2.6
127	312.5	65.4	106.5	94.4	369.2	277.5	342.2	330.8	291.2	65.4	2.6
128	311.1	65.5	105.9	94.0	366.2	276.0	341.4	330.3	289.9	65.5	2.5
129	309.9	65.4	105.7	93.8	363.3	274.6	340.6	329.8	288.7	65.4	2.5
130	308.7	66.0	105.1	94.0	360.5	273.3	339.8	329.4	287.3	66.0	2.4
131	307.9	65.6	105.2	99.2	361.2	276.5	347.0	328.9	292.0	65.6	2.6
132	311.0	65.5	105.6	111.2	372.6	291.2	366.9	328.5	307.2	65.5	2.0

Appendix F 10 hours break-in period (page 34 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
133	314.0	65.3	105.2	98.6	372.7	290.5	364.2	328.3	304.7	65.3	1.9
134	313.1	65.2	105.3	96.9	367.9	286.0	357.1	328.3	299.6	65.2	2.0
135	311.2	65.7	104.9	95.8	363.7	282.4	352.0	328.4	296.3	65.7	2.1
136	307.6	65.6	104.7	95.1	359.9	279.3	348.7	328.3	293.2	65.6	2.1
137	305.0	65.5	104.1	94.6	356.3	276.2	345.8	328.0	290.4	65.5	2.1
138	302.7	65.3	103.8	93.8	352.6	273.4	343.6	327.8	287.9	65.3	2.1
139	300.6	65.9	103.2	93.4	349.2	270.8	341.3	327.3	285.5	65.9	2.2
140	300.7	65.6	103.4	107.7	359.1	284.6	362.4	327.0	301.2	65.6	1.8
141	304.0	65.0	103.6	101.9	365.6	291.7	370.0	326.7	307.2	65.0	1.4
142	303.4	64.8	103.1	96.8	358.8	284.4	359.8	326.7	298.5	64.8	1.6
143	300.4	65.0	102.9	95.3	353.9	279.8	353.0	326.7	293.9	65.0	1.6
144	297.5	65.8	102.5	94.4	349.5	275.6	347.9	326.6	290.2	65.8	1.7
145	294.4	65.3	102.3	93.6	345.3	271.8	343.5	326.4	286.6	65.3	1.7
146	292.4	65.4	102.0	102.6	348.4	278.1	354.1	326.1	294.8	65.4	1.7
147	295.1	65.4	101.9	112.1	357.5	289.1	369.9	325.8	305.9	65.4	1.2
148	296.9	64.7	101.7	97.6	354.7	285.2	362.4	325.6	299.7	64.7	1.2
149	294.7	65.5	101.3	95.6	349.0	279.3	353.8	325.7	293.5	65.5	1.3
150	291.5	65.1	101.1	94.3	343.9	274.3	347.6	325.6	288.8	65.1	1.4
151	288.4	65.8	100.7	93.5	339.1	270.1	342.7	325.4	284.7	65.8	1.5
152	287.5	65.4	100.8	106.3	345.6	280.4	358.9	325.1	297.0	65.4	1.3
153	290.4	64.9	100.9	120.8	353.3	289.9	372.4	324.9	306.5	64.9	0.9
154	290.0	65.0	100.4	96.5	345.6	280.7	357.5	324.8	295.0	65.0	1.0
155	286.8	65.9	100.3	95.2	340.1	275.0	348.8	324.9	289.1	65.9	1.1
156	283.9	66.0	100.0	94.0	334.7	270.0	342.2	324.7	284.4	66.0	1.2
157	282.2	65.2	99.8	104.0	338.4	276.8	353.6	324.4	293.1	65.2	1.2
158	284.1	65.1	99.7	113.0	346.0	286.5	367.2	324.2	302.9	65.1	0.8
159	284.6	65.3	99.2	97.2	341.4	280.5	357.0	324.1	294.9	65.3	0.8
160	282.0	65.7	99.2	95.3	335.1	274.0	346.9	324.1	288.0	65.7	0.9
161	278.6	65.5	98.9	93.9	329.6	268.5	339.9	324.1	282.7	65.5	1.0
162	277.8	65.2	98.8	106.5	335.2	277.3	354.0	323.8	293.9	65.2	0.9
163	280.0	65.1	98.9	114.0	342.2	286.0	366.4	323.6	302.6	65.1	0.5
164	280.2	65.2	98.6	96.8	335.7	277.9	352.7	323.5	291.9	65.2	0.6

Appendix F 10 hours break-in period (page 35 of 35)

Elapsed Time	Flue temp	Room temp	Tunnel dry bulb	Degrees F Outlet air	top	back	right	left	bottom	inlet air	
165	277.4	65.8	98.6	94.8	329.6	271.2	342.4	323.5	285.2	65.8	0.8
166	274.8	65.4	98.3	97.4	325.8	268.4	340.4	323.4	283.6	65.4	1.0
167	274.9	65.1	98.3	110.0	333.5	278.9	354.7	323.1	295.5	65.1	0.6
168	277.3	64.5	98.1	99.6	335.8	281.0	355.2	322.9	296.3	64.5	0.3
169	275.8	65.6	97.8	95.5	328.1	272.1	342.1	322.9	286.5	65.6	0.5
170	272.6	65.8	97.4	93.7	322.1	265.8	333.1	322.9	280.1	65.8	0.6
171	271.5	65.3	97.4	105.3	326.3	272.7	343.9	322.6	289.3	65.3	0.6
172	273.3	65.0	97.5	112.8	332.7	280.5	355.3	322.4	297.3	65.0	0.2
173	273.8	65.7	97.0	96.5	327.2	273.0	343.1	322.3	287.6	65.7	0.3
174	270.7	65.4	97.0	94.4	320.7	265.9	333.1	322.3	280.4	65.4	0.4
175	268.2	65.2	97.0	101.4	320.5	267.4	337.1	322.1	283.7	65.2	0.6
176	269.0	65.0	96.9	111.0	327.1	275.9	349.1	321.8	292.8	65.0	0.2
177	270.9	64.6	96.8	98.3	327.4	275.3	346.4	321.6	290.8	64.6	0.0
178	269.0	66.0	96.3	95.0	319.6	266.4	333.9	321.6	281.0	66.0	0.0
179	265.6	66.1	96.0	95.2	314.2	260.9	327.7	321.5	275.9	66.1	0.3
180	265.3	65.3	96.2	108.5	321.1	270.8	342.2	321.2	287.8	65.3	0.0

Appendix G Stack Loss Efficiency

APPENDIX G

Stack Loss Efficiency

Appendix G Stack Loss Efficiency (page 2 of 20)

Intertek Testing Services NA, Inc.

Manufacturer:	SBI
Model:	Caddy
Date:	01-27-15
Run:	1
Control #:	
Test Duration:	830
Output Category:	Category 1

Technicians: Claude Pelland

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	78.6%	84.9%
Combustion Efficiency	95.0%	95.0%
Heat Transfer Efficiency	83%	89.4%

Output Rate (kJ/h)	16 273	15 436	**(Btu/h)**
Burn Rate (kg/h)	1.05	2.30	**(lb/h)**
Input (kJ/h)	20 704	19 640	**(Btu/h)**

Test Load Weight (dry kg)	14.46	31.86	**dry lb**
MC wet (%)	18.63		
MC dry (%)	22.90		
Particulate (g)	32.452		
CO (g)	1 069		
Test Duration (h)	13.83		

Emissions	**Particulate**	**CO**
g/MJ Output	0.14	4.75
g/kg Dry Fuel	2.24	73.95
g/h	2.35	77.29
lb/MM Btu Output	0.34	11.04

Air/Fuel Ratio (A/F)	17.09

VERSION: **2.4** **2010-04-15**

Appendix G Stack Loss Efficiency (page 3 of 20)

Intertek Testing Services NA, Inc.

Manufacturer:	SBI
Model:	Caddy
Date:	01-29-15
Run:	3
Control #:	
Test Duration:	280
Output Category:	4

Technicians: Claude Pelland

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	72.3%	78.1%
Combustion Efficiency	96.9%	96.9%
Heat Transfer Efficiency	75%	80.6%

Output Rate (kJ/h)	38 178	36 216	**(Btu/h)**
Burn Rate (kg/h)	2.67	5.88	**(lb/h)**
Input (kJ/h)	52 834	50 119	**(Btu/h)**

Test Load Weight (dry kg)	12.45	27.43	**dry lb**
MC wet (%)	19.2		
MC dry (%)	23.76		
Particulate (g)	27.16		
CO (g)	583		
Test Duration (h)	4.67		

Emissions	**Particulate**	**CO**
g/MJ Output	0.15	3.27
g/kg Dry Fuel	2.18	46.86
g/h	5.82	124.99
lb/MM Btu Output	0.35	7.61

Air/Fuel Ratio (A/F)	15.22

VERSION: **2.4** **2010-04-15**

Appendix G Stack Loss Efficiency (page 4 of 20)

Inc.

Manufacturer:	SBI	**Technicians:**	Claude Pelland
Model:			
Date:	2015-01--30		
Run:	4		
Control #:			
Test Duration:	220		
Output Category:	4		

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	74.8%	80.8%
Combustion Efficiency	98.3%	98.3%
Heat Transfer Efficiency	76%	82.2%

Output Rate (kJ/h)	52 327	49 638	**(Btu/h)**
Burn Rate (kg/h)	3.53	7.78	**(lb/h)**
Input (kJ/h)	69 958	66 363	**(Btu/h)**

Test Load Weight (dry kg)	12.95	28.54	**dry lb**
MC wet (%)	18.32		
MC dry (%)	22.43		
Particulate (g)	13.68		
CO (g)	345		
Test Duration (h)	3.67		

Emissions	**Particulate**	**CO**
g/MJ Output	0.07	1.80
g/kg Dry Fuel	1.06	26.64
g/h	3.73	94.08
lb/MM Btu Output	0.17	4.18

Air/Fuel Ratio (A/F)	11.96

VERSION: **2.4** **2010-04-15**

Appendix G Stack Loss Efficiency (page 5 of 20)

Inc.

Manufacturer:	SBI
Model:	Caddy B415.1
Date:	02-02-15
Run:	5
Control #:	
Test Duration:	430
Output Category:	2

Technicians: Claude Pelland

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	75.3%	81.4%
Combustion Efficiency	94.9%	94.9%
Heat Transfer Efficiency	79%	85.8%

Output Rate (kJ/h)	25 782	24 457	**(Btu/h)**
Burn Rate (kg/h)	1.73	3.81	**(lb/h)**
Input (kJ/h)	34 248	32 488	**(Btu/h)**

Test Load Weight (dry kg)	12.39	27.31	**dry lb**
MC wet (%)	19.59		
MC dry (%)	24.36		
Particulate (g)	65.86		
CO (g)	946		
Test Duration (h)	7.17		

Emissions	**Particulate**	**CO**
g/MJ Output	0.36	5.12
g/kg Dry Fuel	5.32	76.32
g/h	9.19	131.95
lb/MM Btu Output	0.83	11.89

Air/Fuel Ratio (A/F)	15.18

VERSION: **2.4** **2010-04-15**

Appendix G Stack Loss Efficiency (page 6 of 20)

Inc.

Manufacturer:	SBI
Model:	Caddy B415.1
Date:	02-03-15
Run:	6
Control #:	
Test Duration:	260
Output Category:	3

Technicians: Claude Pelland

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	71.7%	77.5%
Combustion Efficiency	96.0%	96.0%
Heat Transfer Efficiency	75%	80.7%

Output Rate (kJ/h)	39 792	37 747	**(Btu/h)**
Burn Rate (kg/h)	2.80	6.17	**(lb/h)**
Input (kJ/h)	55 485	52 633	**(Btu/h)**

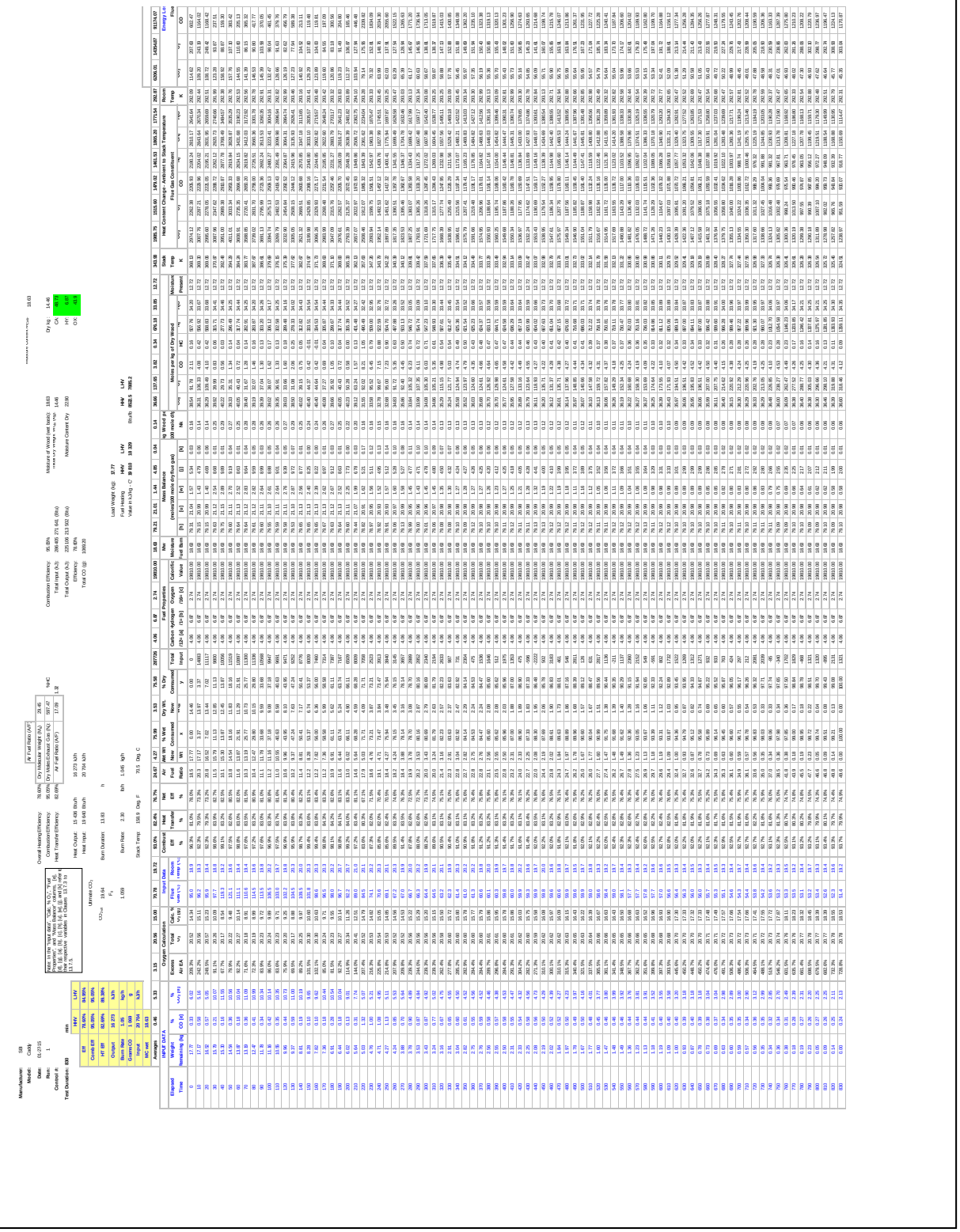
Test Load Weight (dry kg)	12.14	26.75	**dry lb**
MC wet (%)	19.79		
MC dry (%)	24.67		
Particulate (g)	40.81		
CO (g)	749		
Test Duration (h)	4.33		

Emissions	**Particulate**	**CO**
g/MJ Output	0.24	4.34
g/kg Dry Fuel	3.36	61.73
g/h	9.42	172.89
lb/MM Btu Output	0.55	10.10

Air/Fuel Ratio (A/F)	14.41

VERSION: **2.4** **2010-04-15**

Appendix G Stack Loss Efficiency (page 7 of 20)



Appendix G Stack Loss Efficiency (page 8 of 20)

SUMS				AVERAGE	SUMS							
71667.76	25103.43	130077.83	48871.99	4612.57	61258.16	14142.37	47115.8	225467.4	14182.7	1069.2	60.0	
ses (kJ/kg of Dry Fuel)				Total Loss Rate								
Gas Constituent					Total Loss	Chemical Loss 1	Sensible and Latent Loss	Total Output	Chem Loss 2	Grams Produced		
[illegible]	[illegible]	[illegible]	[illegible]							CO	HC	
1107.04	143.14	594.18	592.88	4361.96	0.00	0	0.00	0	0	0.00	0.00	
1227.46	376.48	570.58	593.24	5386.17	3971.53	1151	2820.39	10912	1151	85.85	5.09	
1248.70	375.96	570.48	593.11	5314.81	2982.52	861	2121.64	8134	861	64.37	3.78	
714.18	50.93	607.21	594.14	3421.12	1692.49	142	1550.82	8108	142	11.53	0.45	
799.26	29.85	635.05	603.60	3474.84	1763.97	95	1668.84	8262	95	7.62	0.27	
865.70	123.96	626.80	604.24	3868.99	2249.73	292	1957.31	9269	292	21.83	1.29	
836.98	35.41	624.32	599.85	3556.86	1956.62	131	1825.42	8941	131	11.06	0.35	
741.18	121.06	614.69	599.63	3669.42	2093.65	275	1817.81	9307	275	20.43	1.34	
773.98	144.36	616.64	601.27	3791.34	2169.59	319	1850.55	9167	319	23.43	1.48	
816.29	115.46	618.28	600.75	3769.78	2011.11	257	1754.23	8957	257	19.35	1.10	
759.26	155.76	605.26	597.49	3839.73	1912.87	308	1605.28	8034	308	22.72	1.40	
723.62	120.21	605.32	596.12	3645.32	1763.22	243	1540.42	7907	243	18.23	1.05	
684.58	160.03	600.04	595.71	3705.97	1771.84	293	1479.03	7699	293	21.43	1.37	
672.44	224.21	595.41	596.50	3883.11	1813.52	377	1436.28	7438	377	27.00	1.88	
804.22	41.90	621.11	599.88	3523.67	1581.09	112	1449.48	7215	112	9.26	0.32	
780.67	-9.24	616.78	595.34	3340.13	1350.30	-44	1306.12	6958	-44	4.74	-0.07	
750.97	-9.46	612.80	593.87	3295.87	1241.15	-41	1199.94	6219	-41	4.43	-0.06	
668.58	36.40	605.55	592.96	3304.74	1233.09	86	1134.49	6094	86	7.14	0.24	
668.65	85.55	602.30	593.66	3454.76	1288.23	143	1145.24	6099	143	11.00	0.57	
692.71	35.38	605.41	592.87	3341.90	1209.13	86	1122.84	5958	86	7.27	0.23	
727.95	3.32	603.26	590.84	3310.07	1087.63	55	1032.57	5422	55	5.34	0.02	
782.63	113.04	597.76	589.33	3751.33	1516.53	225	1291.72	6482	225	17.74	0.82	
904.16	936.51	588.09	587.69	6521.36	2323.37	1161	1162.45	4734	1161	81.94	5.98	
785.37	701.09	610.45	583.07	5637.20	718.02	321	396.59	1805	321	22.99	1.60	
752.41	786.85	607.53	581.48	5865.32	1158.51	555	603.66	2754	555	39.55	2.79	
706.78	803.37	604.27	580.87	5840.84	1132.11	552	580.26	2708	552	39.23	2.79	
667.93	564.32	616.38	579.97	5041.57	800.36	330	470.45	2345	330	23.79	1.61	
677.40	446.06	628.67	580.04	4692.13	866.15	315	551.46	2791	315	23.01	1.48	
729.56	659.67	606.45	579.86	5452.68	795.16	353	442.21	2094	353	25.44	1.72	
730.73	640.14	607.65	579.59	5402.24	777.94	341	436.92	2075	341	24.63	1.65	
696.09	632.24	606.64	578.89	5324.39	629.03	276	353.01	1711	276	19.93	1.34	
696.61	544.04	615.52	578.85	5053.12	559.67	228	331.95	1634	228	16.58	1.08	
724.50	481.90	620.40	578.29	4926.14	654.73	251	403.55	1978	251	18.53	1.15	
742.04	479.67	619.76	577.96	4960.92	247.26	95	152.38	740	95	7.03	0.43	
733.59	437.32	622.51	577.37	4827.20	178.22	66	112.54	553	66	4.90	0.29	
724.24	445.18	621.39	577.25	4835.92	562.40	209	352.95	1741	209	15.61	0.93	
735.80	386.14	627.87	577.43	4671.64	112.11	39	73.34	363	39	2.92	0.17	
727.28	426.51	623.27	577.24	4784.28	370.93	135	235.74	1165	135	10.11	0.59	
726.31	421.28	623.09	576.97	4773.00	396.48	144	252.42	1249	144	10.80	0.63	
744.00	417.34	623.77	577.08	4793.43	123.88	45	79.13	388	45	3.36	0.19	
716.05	416.41	623.55	576.96	4737.65	472.26	171	301.64	1502	171	12.78	0.74	
729.70	391.88	626.06	576.97	4688.84	320.25	112	208.03	1033	112	8.46	0.48	
747.12	362.00	625.64	576.81	4728.21	113.47	40	73.61	362	40	3.01	0.17	
704.00	414.36	623.24	576.76	4712.09	-141.74	-51	-90.54	-454	-51	-3.83	-0.22	
694.12	384.97	626.86	577.00	4595.34	-515.34	-178.76	-336.58	-1706	-179	-13.42	-0.77	
760.03	353.63	629.61	576.84	4634.62	117.54	39.23	76.31	385	39	3.00	0.16	
745.43	367.64	628.46	576.94	4645.99	746.53	253.53	492.99	2437	254	19.25	1.06	
777.63	376.23	628.53	577.26	4725.36	109.91	37.58	72.34	351	38	2.86	0.16	
774.79	357.30	629.56	576.96	4672.29	128.67	-43.12	85.56	-417	-43	3.29	0.18	
820.24	363.42	628.87	576.93	4762.97	678.81	229.78	449.03	2133	288	17.64	0.93	
787.15	361.70	629.16	576.98	4710.11	29.94	10.10	19.85	96	108	0.77	0.04	
796.69	349.89	629.18	576.53	4705.63	149.78	50.04	99.74	481	-147	3.85	0.20	
851.00	331.35	631.23	576.59	4755.98	676.30	230.58	455.72	2141	263	17.17	0.85	
841.89	341.00	630.20	576.57	4768.04	273.43	90.37	183.06	863	201	7.01	0.35	
807.57	329.19	631.47	576.60	4661.41	-49.53	-16.06	-33.47	-161	-19	-1.24	-0.06	
806.09	333.41	630.24	576.30	4690.77	268.73	88.11	180.62	869	-13	6.63	0.34	
835.92	320.28	631.31	576.20	4703.99	560.43	180.98	379.45	1800	187	14.14	0.68	
822.96	317.26	631.44	576.13	4670.46	507.31	163.16	344.15	1644	173	12.74	0.62	
811.13	311.45	632.41	576.28	4623.69	128.06	40.69	87.37	421	150	3.17	0.15	
807.42	298.30	633.21	576.08	4745.09	-141.59	-44.55	-97.05	-450	-70	-3.53	-0.16	
864.88	283.96	633.74	575.73	4667.32	189.06	58.49	130.57	613	-18	4.65	0.21	
852.50	282.30	633.90	575.61	4640.84	405.78	125.35	280.43	1326	134	9.96	0.44	
940.56	305.37	631.21	575.59	4894.59	376.07	121.20	254.87	1146	128	9.67	0.42	
944.84	292.86	632.30	575.53	4867.53	311.86	98.92	212.94	957	112	7.93	0.34	
931.71	306.71	630.43	575.35	4890.53	324.00	105.06	218.94	988	88	8.39	0.36	
940.40	292.86	632.10	575.45	4861.54	311.84	99.04	212.80	959	119	7.94	0.34	
971.89	287.73	632.19	575.29	4917.96	231.47	73.44	158.02	701	80	5.93	0.24	
958.31	273.15	632.93	575.01	4896.94	228.70	71.41	157.29	704	65	5.79	0.23	
987.64	231.84	637.21	575.04	4788.74	184.55	54.21	130.33	579	72	4.48	0.18	
993.39	252.06	634.41	574.76	4876.83	104.44	31.93	72.52	320	38	2.63	0.10	
946.44	245.86	634.41	574.53	4769.88	71.52	21.65	49.87	226	25	1.78	0.07	
990.42	236.00	635.89	574.71	4823.46	51.67	15.42	36.24	161	19	1.28	0.05	
999.48	253.98	633.08	574.34	4704.39	494.29	151.31	342.98	1597	12	12.33	0.48	
952.27	246.40	634.48	574.58	4781.57	492.17	149.06	343.11	1547	202	12.24	0.46	
993.79	206.95	638.05	574.42	4755.43	-20.41	-5.86	-14.55	-65	6	-0.49	-0.02	
1033.64	247.36	633.40	574.21	4948.87	-94.96	-26.27	-68.70	-255	-20	-2.18	-0.08	
1104.64	207.36	637.28	574.14	5008.15	430.23	127.01	303.22	1272	-32	10.81	0.32	
1177.91	155.74	643.12	574.37	4990.66	460.83	125.72	335.11	1368	203	11.02	0.26	
1200.37	138.72	644.20	574.13	5001.00	-118.21	-31.74	-86.47	-350	-12	-2.82	-0.06	
1250.42	121.15	645.69	574.03	5061.12	337.37	89.16	248.21	983	-52	8.02	0.14	
1240.59	140.54	644.40	574.28	5083.16	338.73	91.49	247.23	981	286	8.13	0.17	
1215.30	119.98	645.48	573.90	4990.52	-225.39	-59.27	-166.13	-669	-51	-5.33	-0.10	
1271.72	101.43	646.70	573.66	5072.35	545.59	142.13	403.46	1585	-68	12.98	0.20	
1248.71	79.13	648.39	573.45	4968.95	331.34	83.09	248.25	990	166	7.70	0.09	

Appendix G Stack Loss Efficiency (page 9 of 20)

Manufacturer: SBI
Model: Caddy
Date: 01-29-15
Run: 3
Control #:
Test Duration: 280 min

	HHV	LHV
Eff	72.26%	78.10%
Comb Eff	96.94%	96.94%
HT Eff	74.54%	80.56%
Output	38 178	kJ/h
Burn Rate	2.67	kg/h
Grams CO	583	g
Input	52 834	kJ/h
MC wet	19.20	

Note: In the "Input data", "Calc. % O_2", "Fuel Properties", and "Mass Balance" columns, [e], [d], [g], [a], [b], [c], [h], [u], [w], [j], and [k] refer to their respective variables in Clauses 13.7.3 to 13.7.5.

Ultimate CO_2
$CO_{2\text{-ult}}$ 19.64
F_0
1.060

Overall Heating Efficiency:	72.26%	Air Fuel Ratio (A/F)			
Combustion Efficiency:	96.94%	Dry Molecular Weight (M_d)	29.57		
Heat Transfer Efficiency:	74.54%	Dry Moles Exhaust Gas (N_d):	531.75	%HC	Combustion Efficiency:
		Air Fuel Ratio (A/F)	15.22	1.32	Total Input (kJ):
					Total Output (kJ):
					Efficiency:
					Total CO (g):

Heat Output:	36 216	Btu/h	38 178	kJ/h
Heat Input:	50 119	Btu/h	52 834	kJ/h
Burn Duration:	4.67	h		
Burn Rate:	5.88	lb/h	2.667	kg/h
Stack Temp:	322.1	Deg. F	161.2	Deg. C

Elapsed Time	Weight Remaining (kg)	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (°C)	Room Temp (°C)	Combust Eff %	Heat Transfer %	Net Eff %	Air Fuel Ratio	Wet Wt Now Wt	% Wet Consumed x	Dry Wt. Now Wt_{dn}	% Dry Comsumed y	Total Input	Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value
				INPUT DATA		Oxygen Calculation		Input Data										Fuel Properties			
	Averages	0.33	6.34	3.44	20.50	13.99	161.34	21.37	94.7%	71.5%	67.8%	26.51	3.71	75.91	3.00	75.91	247069	4.06	6.87	2.74	19810.00
0	15.40	0.26	11.54	66.5%	20.16	8.49	165.5	21.9	98.3%	80.3%	79.0%	10.0	15.40	0.00	12.45	0.00	0	4.06	6.87	2.74	19810.00
10	13.53	0.50	17.02	12.1%	19.78	2.51	276.8	22.5	97.6%	77.4%	75.6%	6.8	13.53	12.16	10.93	12.16	43611	4.06	6.87	2.74	19810.00
20	11.83	0.69	16.53	14.1%	19.80	2.93	282.8	23.0	96.7%	76.8%	74.3%	6.9	11.83	23.21	9.56	23.21	28360	4.06	6.87	2.74	19810.00
30	9.99	0.68	16.56	13.9%	19.80	2.90	291.9	23.8	96.7%	76.4%	73.9%	6.9	9.99	35.17	8.07	35.17	28215	4.06	6.87	2.74	19810.00
40	8.30	0.32	15.69	22.7%	19.88	4.03	274.3	23.7	98.4%	76.9%	75.6%	7.4	8.30	46.10	6.71	46.10	24729	4.06	6.87	2.74	19810.00
50	6.90	0.18	14.44	34.4%	19.97	5.44	259.0	23.6	99.1%	76.9%	76.2%	8.1	6.90	55.23	5.57	55.23	19645	4.06	6.87	2.74	19810.00
60	5.85	0.07	8.87	119.7%	20.35	11.44	237.4	23.4	99.7%	72.5%	72.3%	13.3	5.85	62.03	4.73	62.03	14525	4.06	6.87	2.74	19810.00
70	5.08	0.10	7.99	142.8%	20.41	12.37	209.8	23.1	99.4%	73.3%	72.9%	14.7	5.08	67.01	4.11	67.01	11329	4.06	6.87	2.74	19810.00
80	4.43	0.10	7.92	144.9%	20.41	12.44	196.2	22.9	99.4%	74.4%	73.9%	14.8	4.43	71.22	3.58	71.22	10204	4.06	6.87	2.74	19810.00
90	3.81	0.07	7.35	164.7%	20.45	13.07	189.0	22.4	99.7%	74.0%	73.8%	16.0	3.81	75.29	3.08	75.29	9223	4.06	6.87	2.74	19810.00
100	3.28	0.16	6.05	216.3%	20.53	14.40	181.1	22.4	98.5%	71.9%	70.9%	19.0	3.28	78.70	2.65	78.70	7735	4.06	6.87	2.74	19810.00
110	2.84	0.23	5.34	252.7%	20.57	15.12	167.5	22.3	97.3%	71.5%	69.6%	21.2	2.84	81.56	2.29	81.56	6318	4.06	6.87	2.74	19810.00
120	2.49	0.46	3.58	386.2%	20.67	16.86	154.4	21.8	91.6%	65.9%	60.4%	28.9	2.49	83.83	2.01	83.83	5919	4.06	6.87	2.74	19810.00
130	2.10	0.42	3.40	414.2%	20.69	17.08	134.7	20.8	92.0%	68.2%	62.8%	30.6	2.10	86.36	1.70	86.36	4212	4.06	6.87	2.74	19810.00
140	1.96	0.40	3.22	442.6%	20.70	17.28	127.5	21.3	92.1%	68.6%	63.2%	32.3	1.96	87.25	1.59	87.25	2978	4.06	6.87	2.74	19810.00
150	1.73	0.39	3.11	461.2%	20.71	17.40	122.9	20.8	92.1%	68.7%	63.3%	33.4	1.73	88.78	1.40	88.78	3522	4.06	6.87	2.74	19810.00
160	1.52	0.40	3.02	474.4%	20.71	17.49	118.7	20.9	91.6%	69.1%	63.3%	34.1	1.52	90.10	1.23	90.10	2905	4.06	6.87	2.74	19810.00
170	1.37	0.39	2.86	504.4%	20.73	17.67	114.3	20.9	91.5%	69.0%	63.1%	35.9	1.37	91.13	1.10	91.13	3885	4.06	6.87	2.74	19810.00
180	1.04	0.42	2.86	498.9%	20.72	17.65	112.2	20.3	90.8%	69.3%	62.9%	35.5	1.04	93.25	0.84	93.25	2723	4.06	6.87	2.74	19810.00
190	1.03	0.49	2.77	502.5%	20.72	17.71	108.9	20.2	89.0%	69.4%	61.7%	35.6	1.03	93.34	0.83	93.34	2723	4.06	6.87	2.74	19810.00
200	0.70	0.45	2.69	525.6%	20.73	17.82	108.3	20.0	89.6%	68.9%	61.8%	37.1	0.70	95.46	0.56	95.46	2397	4.06	6.87	2.74	19810.00
210	0.73	0.40	2.79	515.8%	20.73	17.74	105.1	19.9	91.1%	70.3%	64.0%	36.6	0.73	95.29	0.59	95.29	1997	4.06	6.87	2.74	19810.00
220	0.45	0.40	2.86	502.5%	20.72	17.66	106.5	19.9	91.2%	70.4%	64.3%	35.8	0.45	97.08	0.36	97.08	1416	4.06	6.87	2.74	19810.00
230	0.55	0.31	2.82	527.6%	20.73	17.76	107.4	20.2	93.3%	70.1%	65.4%	37.4	0.55	96.44	0.44	96.44	1162	4.06	6.87	2.74	19810.00
240	0.30	0.29	2.51	601.5%	20.76	18.10	108.6	19.6	93.1%	67.5%	62.9%	41.9	0.30	98.03	0.25	98.03	2796	4.06	6.87	2.74	19810.00
250	0.20	0.26	2.48	616.9%	20.76	18.15	109.0	19.8	93.9%	67.2%	63.1%	42.9	0.20	98.70	0.16	98.70	1271	4.06	6.87	2.74	19810.00
260	0.15	0.26	2.53	604.1%	20.76	18.10	104.9	19.6	94.0%	68.6%	64.5%	42.1	0.15	99.06	0.12	99.06	1089	4.06	6.87	2.74	19810.00
270	0.06	0.26	2.55	599.0%	20.75	18.07	103.1	19.5	94.0%	69.1%	65.0%	41.8	0.06	99.59	0.05	99.59	1670	4.06	6.87	2.74	19810.00
280	0.00	0.24	2.55	604.1%	20.76	18.09	101.3	19.6	94.6%	69.6%	65.8%	42.1	0.00	100.00	0.00	100.00	508	4.06	6.87	2.74	19810.00

Appendix G Stack Loss Efficiency (page 10 of 20)

Moisture Content M_{Cwb}: 19.2

96.94%
246 561 233 851 (Btu)
178 165 168 981 (Btu)
72.26%
583.27

Moisture of Wood (wet basis): 19.2
Initial Dry Weight Wt_{do} (kg): 12.45
Moisture Content Dry 23.76

Dry kg : 12.45
CA: 48.73
HY: 6.87
OX: 43.9

Load Weight (kg): **15.40**

Fuel Heating	HHV	LHV		HHV	LHV
Value in kJ/kg - CV:	**19 810**	**18 329**	Btu/lb	**8522.5**	**7885.2**

19.20	79.34	21.04	1.65	5.61	0.03	0.16	37.54	150.40	3.06	0.20	726.66	34.11	13.20	434.49	5673.17	4226.05	4098.85	4055.66	5556.37	4901.54	294.52	6300.99	13419.41
Mw Moisture	Mass Balance (moles/100 mole dry flue gas)					kg Wood per 100 mole dfp	Moles per kg of Dry Wood						Moisture	Stack Temp	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp		
Fuel Burnt	[h]	[u]	[w]	[j]	[k]	Nk	CO_2	O_2	CO	HC	N_2	H_2O	Present	K	CO_2	O_2	CO	N_2	CH_4	H_2O	K	CO_2	O_2
19.20	79.71	21.14	2.91	9.95	0.02	0.29	39.83	29.31	0.90	0.08	275.12	34.36	13.20	438.61	5766.32	4317.51	4193.04	4147.70	5599.27	5015.92	295.09	229.68	126.53
19.20	79.97	21.21	4.33	14.74	0.07	0.43	39.49	5.83	1.16	0.16	185.55	34.20	13.20	549.99	10631.86	7779.57	7510.58	7438.78	########	8970.30	295.66	419.88	45.37
19.20	79.85	21.18	4.26	14.46	0.10	0.42	38.96	6.90	1.63	0.23	188.21	34.07	13.20	555.93	10885.16	7954.77	7677.16	7604.30	########	9168.43	296.11	424.09	54.90
19.20	79.86	21.18	4.27	14.47	0.09	0.42	38.99	6.83	1.60	0.22	188.02	34.08	13.20	565.06	11271.97	8221.21	7930.19	7855.81	########	9469.30	296.92	439.48	56.16
19.20	79.96	21.21	3.95	13.50	0.04	0.39	39.90	10.25	0.81	0.10	203.32	34.32	13.20	547.42	10469.99	7663.28	7398.86	7328.01	########	8837.04	296.83	417.72	78.59
19.20	79.94	21.20	3.60	12.35	0.02	0.36	40.26	15.18	0.50	0.05	222.88	34.43	13.20	532.10	9781.81	7181.78	6939.57	6871.94	9810.08	8290.27	296.72	393.83	109.03
19.20	79.62	21.12	2.20	7.57	-0.01	0.22	40.53	52.29	0.32	-0.04	363.79	34.60	13.20	510.51	8823.17	6506.54	6294.31	6231.44	8786.07	7521.72	296.57	357.60	340.26
19.20	79.54	21.10	1.99	6.85	-0.01	0.20	40.33	62.42	0.50	-0.03	401.55	34.58	13.20	482.93	7624.23	5654.65	5478.30	5421.87	7521.51	6549.17	296.24	307.52	352.99
19.20	79.54	21.10	1.97	6.79	-0.01	0.20	40.33	63.35	0.51	-0.03	405.04	34.58	13.20	469.33	7042.75	5238.36	5078.72	5025.62	6915.08	6072.68	296.03	284.04	331.85
19.20	79.51	21.09	1.82	6.29	-0.01	0.18	40.49	71.97	0.39	-0.06	438.00	34.64	13.20	462.19	6755.34	5032.61	4881.24	4829.79	6615.32	5837.19	295.51	273.50	362.18
19.20	79.39	21.06	1.53	5.25	0.00	0.15	39.76	94.63	1.05	0.00	521.74	34.52	13.20	454.29	6415.48	4787.30	4645.27	4595.89	6265.26	5555.62	295.54	255.08	453.05
19.20	79.31	21.04	1.37	4.70	0.01	0.14	39.06	110.58	1.68	0.07	580.18	34.39	13.20	440.69	5840.43	4370.75	4244.18	4198.41	5676.16	5076.92	295.46	228.14	483.33
19.20	79.10	20.98	1.00	3.37	0.04	0.10	35.81	168.69	4.60	0.40	791.22	33.72	13.20	427.54	5305.48	3981.91	3869.44	3827.12	5131.09	4629.56	294.96	190.00	671.70
19.20	79.10	20.98	0.95	3.19	0.03	0.09	36.01	180.86	4.45	0.36	837.72	33.81	13.20	407.89	4524.00	3410.38	3317.75	3280.69	4342.47	3970.67	293.98	162.90	616.80
19.20	79.10	20.98	0.90	3.03	0.03	0.09	36.00	193.20	4.47	0.34	884.32	33.84	13.20	400.67	4209.28	3177.76	3092.59	3057.80	4030.22	3701.56	294.42	151.53	613.94
19.20	79.10	20.98	0.87	2.93	0.03	0.09	35.97	201.28	4.51	0.33	914.77	33.86	13.20	396.08	4040.60	3053.78	2972.76	2939.14	3861.37	3558.39	293.91	145.33	614.67
19.20	79.09	20.98	0.85	2.86	0.03	0.08	35.72	206.94	4.73	0.36	935.52	33.81	13.20	391.82	3861.40	2920.96	2844.10	2811.80	3684.39	3404.58	294.03	137.94	604.47
19.20	79.08	20.98	0.81	2.72	0.03	0.08	35.60	219.98	4.86	0.35	984.45	33.82	13.20	387.44	3682.19	2788.03	2715.31	2684.34	3507.62	3250.63	294.04	131.10	613.30
19.20	79.07	20.97	0.82	2.74	0.03	0.08	35.23	217.48	5.17	0.40	974.06	33.71	13.20	385.33	3616.88	2740.17	2669.08	2638.56	3441.93	3195.41	293.49	127.44	595.94
19.20	79.03	20.96	0.81	2.71	0.04	0.08	34.23	218.83	6.05	0.53	976.53	33.46	13.20	382.02	3487.51	2644.14	2576.04	2546.47	3314.47	3084.16	293.35	119.37	578.61
19.20	79.04	20.97	0.78	2.61	0.04	0.08	34.56	228.89	5.78	0.47	1015.42	33.57	13.20	381.48	3475.14	2635.21	2567.45	2537.96	3301.72	3073.92	293.10	120.09	603.19
19.20	79.07	20.97	0.79	2.66	0.03	0.08	35.36	224.86	5.07	0.38	1002.27	33.77	13.20	378.29	3347.50	2540.21	2475.33	2446.81	3176.53	2963.76	293.06	118.38	571.18
19.20	79.08	20.97	0.81	2.72	0.03	0.08	35.48	219.14	4.96	0.37	980.96	33.78	13.20	379.62	3403.21	2581.77	2515.65	2486.70	3230.98	3011.99	293.01	120.74	565.77
19.20	79.11	20.98	0.77	2.63	0.02	0.08	36.58	230.33	4.02	0.22	1026.10	34.09	13.20	380.53	3428.97	2600.63	2533.86	2504.73	3256.93	3033.73	293.30	125.42	599.00
19.20	79.10	20.98	0.69	2.35	0.01	0.07	36.41	262.59	4.21	0.19	1147.56	34.14	13.20	381.73	3496.91	2651.76	2583.57	2553.90	3322.34	3093.22	292.79	127.34	696.33
19.20	79.11	20.98	0.68	2.31	0.01	0.07	36.82	269.48	3.86	0.13	1174.63	34.26	13.20	382.12	3506.38	2658.61	2590.17	2560.44	3332.05	3101.10	292.97	129.11	716.43
19.20	79.11	20.99	0.69	2.35	0.01	0.07	36.89	263.88	3.79	0.13	1153.66	34.27	13.20	378.00	3347.63	2540.65	2475.83	2447.29	3175.93	2964.39	292.74	123.50	670.42
19.20	79.12	20.99	0.69	2.37	0.01	0.07	36.92	261.69	3.76	0.13	1145.48	34.27	13.20	376.21	3279.43	2489.93	2426.66	2398.63	3108.95	2905.60	292.63	121.08	651.59
19.20	79.12	20.99	0.69	2.35	0.01	0.07	37.22	264.00	3.50	0.09	1155.00	34.35	13.20	374.41	3200.96	2431.23	2369.66	2342.25	3032.65	2837.42	292.78	119.15	641.85

Appendix G Stack Loss Efficiency (page 11 of 20)

SUMS					AVERAGE	SUMS						
25429.38	67632.33	5310.73	48356.92	18709.66	6384.81	68395.75	7542.42	60853.3	178673.4	7542.4	583.3	29.6
Energy Losses (kJ/kg of Dry Fuel) Flue Gas Constituent					Total Loss Rate	Total Loss	Chemical Loss 1	Sensible and Latent Loss	Total Output	Chem Loss 2	Grams Produced	
CO	N_2	CH_4	H_2O Comb	H_2O Fuel MC							CO	HC
257.68	1141.13	74.94	1682.89	646.67	4159.53	0.00	0	0.00	0	0	0.00	0.00
337.04	1380.28	143.90	1810.69	698.87	4836.03	10646.36	1036	9610.55	32965	1036	71.51	5.63
472.71	1431.18	203.62	1810.43	701.49	5098.42	7298.88	947	6352.07	21061	947	65.19	5.18
465.77	1477.04	200.50	1821.06	705.46	5165.48	7357.01	927	6429.78	20858	927	63.85	5.07
236.29	1489.90	91.97	1812.22	697.12	4823.80	6021.52	401	5620.61	18707	401	28.44	2.04
145.51	1531.59	43.86	1799.03	689.90	4712.75	4673.49	184	4489.63	14971	184	13.94	0.77
92.53	2266.93	-33.72	1781.46	679.75	5484.81	4021.53	42	3979.64	10503	42	6.57	-0.44
145.62	2177.14	-24.10	1746.73	666.91	5372.82	3072.74	68	3004.71	8257	68	8.08	-0.25
146.69	2035.57	-24.84	1730.34	660.62	5164.27	2660.02	62	2598.49	7544	62	7.34	-0.23
111.00	2115.43	-53.43	1725.37	657.51	5191.57	2417.14	26	2391.03	6806	26	5.03	-0.44
302.45	2397.87	0.92	1709.62	653.80	5772.77	2253.90	117	2137.36	5481	117	11.50	0.01
483.27	2435.84	60.32	1686.59	647.48	6024.97	1921.65	171	1750.67	4397	171	15.03	0.34
1319.99	3028.10	357.54	1638.93	641.57	7847.83	2344.81	495	1849.52	3574	495	38.50	1.91
1273.49	2748.29	319.69	1620.74	632.87	7374.77	1568.11	335	1232.82	2644	335	26.48	1.22
1279.37	2704.08	304.95	1613.20	629.32	7296.39	1096.71	236	860.86	1881	236	18.82	0.82
1289.85	2688.65	298.29	1609.05	627.43	7273.28	1293.22	280	1013.45	2229	280	22.46	0.95
1352.48	2630.48	318.91	1601.66	625.40	7271.34	1066.29	243	823.36	1839	243	19.43	0.84
1387.12	2642.59	316.18	1596.73	623.37	7310.39	1433.82	331	1102.57	2452	331	26.66	1.11
1478.07	2570.13	361.31	1590.10	622.64	7345.62	1009.86	251	759.07	1714	251	19.92	0.89
1729.02	2486.71	473.99	1574.47	621.17	7583.35	1042.54	300	742.06	1681	300	23.31	1.17
1650.80	2577.09	423.87	1579.41	621.03	7575.48	916.48	249	667.47	1480	249	19.58	0.92
1447.39	2452.35	337.07	1584.82	619.58	7130.78	718.90	179	540.38	1278	179	14.31	0.61
1416.74	2439.36	331.23	1587.07	620.22	7081.13	506.22	124	382.24	910	124	9.93	0.42
1148.04	2570.10	192.56	1602.40	620.50	6858.02	402.27	78	324.27	760	78	6.60	0.20
1201.49	2930.75	170.48	1606.75	621.29	7354.43	1038.03	192	846.01	1758	192	16.63	0.43
1102.48	3007.57	115.42	1612.82	621.39	7305.23	468.67	77	391.21	802	77	6.93	0.13
1082.32	2823.33	114.45	1608.24	619.59	7041.85	387.24	65	321.96	702	65	5.84	0.11
1074.44	2747.58	114.08	1606.26	618.81	6933.84	584.66	99	485.25	1086	99	8.89	0.17
999.73	2705.30	76.75	1607.84	617.91	6768.53	173.70	27	146.29	335	27	2.52	0.04

Appendix G Stack Loss Efficiency (page 12 of 20)

Manufacturer: SBI
Model:
Date: 2015-01--30
Run: 4
Control #:
Test Duration: 220 min

	HHV	LHV
Eff	74.80%	80.84%
Comb Eff	98.31%	98.31%
HT Eff	76.08%	82.23%
Output	52 327	kJ/h
Burn Rate	3.53	kg/h
Grams CO	345	g
Input	69 958	kJ/h
MC wet	18.32	

Note: In the "Input data", "Calc. % O_2", "Fuel Properties", and "Mass Balance" columns, [e], [d], [g], [a], [b], [c], [h], [u], [w], [j], and [k] refer to their respective variables in Clauses 13.7.3 to 13.7.5.

Ultimate CO_2
$CO_{2\text{-ult}}$ 19.64
F_0
1.062

Overall Heating Efficiency: 74.80%
Combustion Efficiency: 98.31%
Heat Transfer Efficiency: 76.08%

Air Fuel Ratio (A/F)	
Dry Molecular Weight (M_d)	29.84
Dry Moles Exhaust Gas (N_d):	417.91
Air Fuel Ratio (A/F)	11.96

%HC 1.32

Heat Output: 49 638 Btu/h 52 327 kJ/h
Heat Input: 66 363 Btu/h 69 958 kJ/h

Burn Duration: 3.67 h

Burn Rate: 7.78 lb/h 3.531 kg/h

Stack Temp: 377.5 Deg. F 191.9 Deg. C

Combustion Efficiency:
Total Input (kJ):
Total Output (kJ):
Efficiency:
Total CO (g):

Elapsed Time	Weight Remaining (kg)	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (°C)	Room Temp (°C)	Combust Eff %	Heat Transfer %	Net Eff %	Air Fuel Ratio	Wet Wt Now Wt	% Wet Consumed x	Dry Wt. Now Wt_{dn}	% Dry Comsumed y	Total Input	Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value
				INPUT DATA		Oxygen Calculation		Input Data										Fuel Properties			
	Averages	0.24	8.61	1.53	20.36	11.63	191.55	22.85	97.8%	75.3%	73.6%	15.23	4.97	68.66	4.06	68.66	257909	4.06	6.87	2.74	19810.00
0	15.85	0.50	7.98	131.6%	20.38	12.15	183.4	21.9	95.4%	75.5%	72.1%	13.9	15.85	0.00	12.95	0.00	0	4.06	6.87	2.74	19810.00
10	14.02	0.71	15.93	18.0%	19.84	3.56	261.0	23.3	96.5%	77.8%	75.0%	7.1	14.02	11.53	11.46	11.53	43572	4.06	6.87	2.74	19810.00
20	12.30	0.64	16.22	16.5%	19.83	3.29	271.6	24.1	96.8%	77.5%	75.0%	7.0	12.30	22.44	10.04	22.44	26136	4.06	6.87	2.74	19810.00
30	10.79	0.19	13.50	43.5%	20.04	6.44	256.0	23.4	99.0%	76.6%	75.8%	8.7	10.79	31.91	8.82	31.91	21437	4.06	6.87	2.74	19810.00
40	9.65	0.13	11.88	63.6%	20.15	8.20	239.1	23.5	99.3%	76.3%	75.7%	9.9	9.65	39.15	7.88	39.15	18537	4.06	6.87	2.74	19810.00
50	8.50	0.08	10.87	79.4%	20.22	9.31	228.5	23.4	99.6%	76.0%	75.7%	10.8	8.50	46.37	6.95	46.37	17730	4.06	6.87	2.74	19810.00
60	7.45	0.08	10.16	91.8%	20.26	10.06	217.8	22.9	99.6%	75.9%	75.6%	11.6	7.45	52.98	6.09	52.98	16262	4.06	6.87	2.74	19810.00
70	6.49	0.10	10.07	93.1%	20.27	10.15	211.8	23.5	99.5%	76.3%	75.9%	11.7	6.49	59.04	5.30	59.04	15197	4.06	6.87	2.74	19810.00
80	5.58	0.11	10.22	90.2%	20.26	9.98	208.0	23.4	99.4%	76.7%	76.2%	11.5	5.58	64.83	4.55	64.83	14279	4.06	6.87	2.74	19810.00
90	4.73	0.09	9.95	95.6%	20.28	10.28	206.0	23.4	99.5%	76.6%	76.2%	11.8	4.73	70.18	3.86	70.18	13472	4.06	6.87	2.74	19810.00
100	3.91	0.05	9.61	103.3%	20.30	10.67	205.2	23.0	99.9%	76.2%	76.1%	12.3	3.91	75.33	3.19	75.33	12517	4.06	6.87	2.74	19810.00
110	3.18	0.06	8.86	120.2%	20.35	11.46	199.6	23.1	99.8%	75.7%	75.6%	13.3	3.18	79.94	2.60	79.94	10682	4.06	6.87	2.74	19810.00
120	2.59	0.05	7.81	149.9%	20.42	12.59	188.5	23.2	99.9%	75.1%	75.1%	15.1	2.59	83.66	2.12	83.66	8773	4.06	6.87	2.74	19810.00
130	2.10	0.10	6.53	196.3%	20.50	13.92	185.1	23.0	99.3%	72.9%	72.5%	17.9	2.10	86.78	1.71	86.78	7121	4.06	6.87	2.74	19810.00
140	1.71	0.14	6.34	203.1%	20.51	14.10	175.7	22.8	98.8%	73.5%	72.6%	18.3	1.71	89.21	1.40	89.21	5396	4.06	6.87	2.74	19810.00
150	1.43	0.27	5.68	230.1%	20.55	14.73	168.8	22.6	96.9%	72.5%	70.3%	19.8	1.43	90.98	1.17	90.98	4552	4.06	6.87	2.74	19810.00
160	1.15	0.40	5.34	242.2%	20.56	15.02	161.4	22.5	94.9%	72.4%	68.7%	20.4	1.15	92.76	0.94	92.76	3964	4.06	6.87	2.74	19810.00
170	0.94	0.39	5.65	225.2%	20.54	14.70	148.0	22.5	95.3%	74.8%	71.3%	19.4	0.94	94.08	0.77	94.08	3120	4.06	6.87	2.74	19810.00
180	0.76	0.37	5.45	237.5%	20.56	14.92	143.4	22.4	95.4%	74.9%	71.4%	20.2	0.76	95.19	0.62	95.19	2753	4.06	6.87	2.74	19810.00
190	0.60	0.33	5.26	251.4%	20.57	15.15	140.2	22.3	95.8%	74.8%	71.7%	21.0	0.60	96.22	0.49	96.22	3194	4.06	6.87	2.74	19810.00
200	0.37	0.32	5.07	264.4%	20.58	15.35	136.1	22.2	95.8%	74.8%	71.7%	21.8	0.37	97.68	0.30	97.68	3451	4.06	6.87	2.74	19810.00
210	0.17	0.28	4.81	285.9%	20.60	15.65	134.9	21.8	96.2%	74.3%	71.5%	23.1	0.17	98.91	0.14	98.91	4368	4.06	6.87	2.74	19810.00
220	0.00	0.23	4.73	296.0%	20.61	15.77	135.7	21.4	97.0%	73.9%	71.7%	23.8	0.00	100.00	0.00	100.00	1395	4.06	6.87	2.74	19810.00

Appendix G Stack Loss Efficiency (page 13 of 20)

Moisture Content M_{Cwet}: 18.32

98.31%
256 514 243 291 (Btu)
191 865 181 974 (Btu)
74.80%
344.95

Moisture of Wood (wet basis): 18.32
Initial Dry Weight Wt_{do} (kg): 12.95
Moisture Content Dry 22.43

Dry kg : 12.95
CA: 48.73
HY: 6.87
OX: 43.9

Load Weight (kg): **15.85**

Fuel Heating	HHV	LHV		HHV	LHV
Value in kJ/kg - CV:	**19 810**	**18 329**	Btu/lb	**8522.5**	**7885.2**

18.32	79.52	21.09	2.18	7.47	0.02	0.22	39.45	67.25	1.28	0.08	417.45	34.36	12.46	464.70	6868.83	5103.32	4946.39	4894.97	6756.76	5914.00	296.00	6256.13	6835.17
Mw Moisture	Mass Balance (moles/100 mole dry flue gas)					kg Wood per 100 mole dfp	Moles per kg of Dry Wood						Moisture	Stack Temp	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp		
Fuel Burnt	[h]	[u]	[w]	[j]	[k]	Nk	CO_2	O_2	CO	HC	N_2	H_2O	Present	K	CO_2	O_2	CO	N_2	CH_4	H_2O	K	CO_2	O_2
18.32	79.37	21.05	2.10	7.11	0.05	0.21	38.17	58.11	2.39	0.26	379.60	34.01	12.46	456.57	6533.18	4873.34	4728.31	4678.14	6384.09	5654.80	295.01	249.34	283.19
18.32	79.80	21.17	4.12	13.96	0.10	0.41	38.84	8.67	1.73	0.24	194.59	34.05	12.46	534.10	9880.92	7251.97	7006.75	6938.60	9915.11	8370.32	296.48	383.80	62.89
18.32	79.85	21.18	4.17	14.16	0.09	0.42	39.06	7.91	1.54	0.21	192.29	34.10	12.46	544.74	10331.35	7565.16	7304.97	7234.84	########	8725.18	297.28	403.54	59.88
18.32	79.87	21.19	3.38	11.56	0.02	0.34	40.20	19.18	0.57	0.05	237.80	34.42	12.46	529.11	9654.94	7093.18	6855.11	6788.06	9672.88	8189.74	296.53	388.08	136.03
18.32	79.79	21.16	2.96	10.15	0.01	0.29	40.35	27.86	0.44	0.02	271.01	34.48	12.46	512.27	8897.08	6558.54	6343.98	6280.75	8865.13	7580.88	296.68	359.01	182.71
18.32	79.74	21.15	2.70	9.27	0.00	0.27	40.53	34.70	0.30	-0.01	297.30	34.55	12.46	501.61	8430.93	6228.62	6028.30	5967.49	8370.63	7204.75	296.54	341.68	216.13
18.32	79.70	21.14	2.52	8.67	0.00	0.25	40.51	40.13	0.32	-0.02	317.78	34.56	12.46	490.91	7979.74	5908.84	5722.19	5663.75	7893.03	6839.98	296.05	323.27	237.11
18.32	79.68	21.14	2.50	8.60	0.00	0.25	40.42	40.73	0.40	-0.01	319.82	34.54	12.46	484.94	7694.46	5703.85	5525.24	5468.48	7597.13	6605.06	296.69	310.99	232.34
18.32	79.69	21.14	2.54	8.74	0.00	0.25	40.38	39.44	0.43	0.00	314.83	34.52	12.46	481.10	7534.27	5589.75	5415.87	5359.99	7428.81	6474.68	296.51	304.22	220.47
18.32	79.68	21.13	2.47	8.50	0.00	0.25	40.46	41.81	0.37	-0.01	324.00	34.55	12.46	479.14	7449.04	5528.75	5357.33	5301.94	7339.86	6404.88	296.51	301.39	231.16
18.32	79.67	21.13	2.38	8.18	-0.01	0.24	40.64	45.11	0.21	-0.04	336.95	34.61	12.46	478.38	7428.06	5514.41	5343.74	5288.43	7316.50	6388.73	296.19	301.90	248.78
18.32	79.62	21.12	2.19	7.56	-0.01	0.22	40.58	52.50	0.27	-0.04	364.68	34.61	12.46	472.73	7181.55	5337.60	5173.95	5120.06	7060.12	6186.23	296.23	291.44	280.20
18.32	79.55	21.10	1.93	6.66	-0.01	0.19	40.62	65.46	0.26	-0.07	413.76	34.66	12.46	461.63	6699.46	4990.71	4840.53	4789.52	6561.18	5788.48	296.33	272.13	326.69
18.32	79.45	21.07	1.63	5.62	-0.01	0.16	40.24	85.80	0.62	-0.05	489.64	34.62	12.46	458.29	6563.07	4892.70	4746.36	4696.16	6419.74	5676.15	296.16	264.13	419.81
18.32	79.42	21.07	1.60	5.48	0.00	0.16	39.94	88.85	0.88	-0.01	500.37	34.55	12.46	448.81	6166.91	4606.72	4471.26	4423.47	6011.74	5347.90	295.93	246.34	409.30
18.32	79.32	21.04	1.47	5.01	0.02	0.15	38.86	100.79	1.85	0.11	542.63	34.31	12.46	441.99	5882.79	4400.92	4273.11	4227.10	5720.67	5111.40	295.79	228.59	443.55
18.32	79.24	21.02	1.42	4.82	0.03	0.14	37.74	106.17	2.83	0.24	560.07	34.04	12.46	434.56	5575.27	4177.58	4057.92	4013.88	5406.92	4854.52	295.62	210.43	443.54
18.32	79.26	21.02	1.50	5.07	0.03	0.15	37.97	98.76	2.62	0.22	532.66	34.08	12.46	421.14	5012.69	3766.76	3661.51	3621.22	4837.84	4381.14	295.61	190.32	372.00
18.32	79.26	21.02	1.44	4.89	0.03	0.14	38.02	104.10	2.58	0.21	552.96	34.11	12.46	416.57	4825.26	3629.52	3528.99	3489.97	4649.06	4222.86	295.53	183.47	377.82
18.32	79.26	21.02	1.38	4.70	0.02	0.14	38.24	110.11	2.40	0.17	576.26	34.18	12.46	413.39	4695.28	3534.19	3436.90	3398.77	4518.50	4112.85	295.48	179.55	389.16
18.32	79.26	21.02	1.33	4.53	0.02	0.13	38.23	115.79	2.41	0.17	597.68	34.19	12.46	409.26	4527.25	3410.80	3317.67	3280.70	4350.02	3970.41	295.38	173.09	394.93
18.32	79.26	21.02	1.26	4.29	0.02	0.13	38.45	125.13	2.24	0.12	633.54	34.27	12.46	408.07	4495.82	3388.32	3296.10	3259.31	4317.19	3944.69	294.92	172.86	423.99
18.32	79.27	21.03	1.22	4.19	0.01	0.12	38.86	129.53	1.89	0.07	651.21	34.39	12.46	408.89	4543.83	3424.17	3330.88	3293.73	4364.04	3986.29	294.56	176.55	443.52

Appendix G Stack Loss Efficiency (page 14 of 20)

SUMS					AVERAGE	SUMS						
8492.91	43235.11	1630.80	39428.25	14296.22	5224.98	64649.60	4342.55	60307.1	193259.6	4342.6	344.9	15.4
Energy Losses (kJ/kg of Dry Fuel) Flue Gas Constituent					Total Loss Rate	Total Loss	Chemical Loss 1	Sensible and Latent Loss	Total Output	Chem Loss 2	Grams Produced	
CO	N_2	CH_4	H_2O Comb	H_2O Fuel MC							CO	HC
687.92	1775.84	228.70	1687.83	618.34	5531.16	0.00	0	0.00	0	0	0.00	0.00
502.05	1350.17	214.58	1781.93	652.18	4947.61	10882.30	1544	9337.93	32690	1544	106.62	8.39
447.40	1391.22	190.85	1796.81	656.60	4946.29	6525.80	824	5701.50	19610	824	56.93	4.47
163.97	1614.22	46.44	1795.27	649.93	4793.94	5187.76	223	4964.80	16250	223	17.14	0.89
127.76	1702.12	17.57	1777.62	642.35	4809.14	4500.21	133	4367.00	14037	133	11.57	0.29
86.20	1774.16	-11.10	1767.92	637.66	4812.65	4307.30	66	4241.60	13423	66	7.47	-0.18
92.10	1799.81	-16.22	1755.89	633.11	4825.07	3960.79	61	3899.88	12301	61	7.33	-0.24
115.80	1748.92	-6.31	1746.66	630.19	4778.59	3665.85	82	3583.51	11531	82	8.62	-0.09
125.34	1687.50	-0.09	1741.46	628.56	4707.46	3393.20	89	3304.62	10886	89	8.77	0.00
105.53	1717.83	-12.49	1740.44	627.69	4711.54	3204.08	62	3142.08	10268	62	6.97	-0.15
60.97	1781.95	-37.48	1742.69	627.49	4726.29	2986.41	14	2972.08	9531	14	3.74	-0.42
79.19	1867.20	-39.83	1735.94	624.97	4839.11	2609.35	21	2588.73	8073	21	4.15	-0.38
74.85	1981.71	-60.45	1724.47	620.01	4939.41	2187.50	6	2181.48	6586	6	3.22	-0.48
177.33	2299.40	-43.22	1718.67	618.61	5454.73	1960.87	47	1913.60	5160	47	6.20	-0.28
253.56	2213.36	-12.88	1703.97	614.52	5428.17	1478.58	65	1414.07	3917	65	6.73	-0.06
530.62	2293.76	95.95	1683.87	611.57	5887.92	1352.87	142	1210.86	3199	142	11.88	0.39
811.57	2248.06	216.11	1661.95	608.37	6200.03	1240.77	203	1037.67	2724	203	15.84	0.77
751.27	1928.87	199.71	1647.60	602.47	5692.25	896.56	148	748.45	2224	148	11.56	0.56
739.61	1929.81	186.84	1643.58	600.50	5661.62	786.82	127	659.47	1966	127	10.04	0.46
687.18	1958.57	154.39	1643.32	599.13	5611.29	904.60	134	770.38	2289	134	10.83	0.45
690.92	1960.82	148.02	1639.13	597.36	5604.26	976.16	145	831.55	2474	145	11.77	0.46
640.78	2064.91	111.76	1642.13	597.04	5653.46	1246.62	164	1082.43	3122	164	13.82	0.44
540.98	2144.90	59.95	1649.11	597.55	5612.58	395.20	42	353.35	1000	42	3.73	0.08

Appendix G Stack Loss Efficiency (page 15 of 20)

Manufacturer: SBI
Model: Caddy B415.1
Date: 02-02-15
Run: 5
Control #:
Test Duration: 430 min

	HHV	LHV
Eff	75.28%	81.37%
Comb Eff	94.88%	94.88%
HT Eff	79.34%	85.76%
Output	25 782	kJ/h
Burn Rate	1.73	kg/h
Grams CO	946	g
Input	34 248	kJ/h
MC wet	19.59	

Note: In the "Input data", "Calc. % O_2", "Fuel Properties", and "Mass Balance" columns, [e], [d], [g], [a], [b], [c], [h], [u], [w], [j], and [k] refer to their respective variables in Clauses 13.7.3 to 13.7.5.

Ultimate CO_2
$CO_{2\text{-ult}}$ 19.64
F_0
1.060

Overall Heating Efficiency:	75.28%	Air Fuel Ratio (A/F)			
Combustion Efficiency:	94.88%	Dry Molecular Weight (M_d)	29.56		
Heat Transfer Efficiency:	79.34%	Dry Moles Exhaust Gas (N_d):	530.96	%HC	Combustion Efficiency:
		Air Fuel Ratio (A/F)	15.18	1.32	Total Input (kJ):
					Total Output (kJ):
Heat Output:	24 457 Btu/h	25 782 kJ/h			Efficiency:
Heat Input:	32 488 Btu/h	34 248 kJ/h			Total CO (g):
Burn Duration:	7.17 h				
Burn Rate:	3.81 lb/h	1.729 kg/h			
Stack Temp:	235.9 Deg. F	113.3 Deg. C			

Elapsed Time	Weight Remaining (kg)	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (°C)	Room Temp (°C)	Combust Eff %	Heat Transfer %	Net Eff %	Air Fuel Ratio	Wet Wt Now Wt	% Wet Consumed x	Dry Wt. Now Wt_{dn}	% Dry Comsumed y	Total Input	Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value
	INPUT DATA			Oxygen Calculation			Input Data											Fuel Properties			
				2.77	20.50	14.05	112.97	19.96	94.1%	76.4%	71.9%	22.48	4.98	67.66	4.01	67.66	247431	4.06	6.87	2.74	19810.00
0	15.41	0.43	4.47	300.9%	20.62	15.93	99.7	18.3	93.5%	77.4%	72.4%	23.9	15.41	0.00	12.39	0.00	0	4.06	6.87	2.74	19810.00
10	14.53	0.49	12.28	53.8%	20.10	7.57	188.4	19.5	96.9%	79.1%	76.7%	9.2	14.53	5.71	11.68	5.71	20562	4.06	6.87	2.74	19810.00
20	13.71	0.77	4.23	292.9%	20.61	15.99	104.7	20.8	88.1%	76.1%	67.0%	23.1	13.71	11.04	11.02	11.04	11889	4.06	6.87	2.74	19810.00
30	13.04	0.77	7.17	147.4%	20.42	12.86	91.4	19.8	92.3%	82.1%	75.8%	14.7	13.04	15.40	10.48	15.40	9432	4.06	6.87	2.74	19810.00
40	12.52	0.36	9.11	107.4%	20.31	11.02	109.9	20.0	97.1%	82.3%	79.9%	12.5	12.52	18.73	10.07	18.73	9612	4.06	6.87	2.74	19810.00
50	11.83	0.38	8.62	118.3%	20.35	11.54	119.7	19.7	96.8%	81.2%	78.6%	13.1	11.83	23.23	9.51	23.23	11745	4.06	6.87	2.74	19810.00
60	11.05	0.64	7.41	144.0%	20.41	12.68	103.9	19.6	93.8%	81.3%	76.2%	14.5	11.05	28.30	8.88	28.30	10769	4.06	6.87	2.74	19810.00
70	10.48	0.92	12.70	44.2%	20.04	6.88	128.8	19.9	94.5%	82.7%	78.1%	8.6	10.48	32.01	8.42	32.01	10444	4.06	6.87	2.74	19810.00
80	9.74	0.34	11.60	64.5%	20.15	8.38	124.1	20.1	97.8%	82.7%	80.9%	9.9	9.74	36.81	7.83	36.81	11817	4.06	6.87	2.74	19810.00
90	8.99	0.49	11.78	60.1%	20.13	8.10	126.5	20.5	96.8%	82.6%	80.0%	9.6	8.99	41.64	7.23	41.64	11998	4.06	6.87	2.74	19810.00
100	8.23	0.56	11.84	58.4%	20.12	8.00	129.0	20.4	96.4%	82.5%	79.5%	9.5	8.23	46.58	6.62	46.58	11130	4.06	6.87	2.74	19810.00
110	7.60	0.34	10.11	88.0%	20.25	9.97	121.4	20.5	97.5%	82.2%	80.1%	11.3	7.60	50.71	6.11	50.71	9432	4.06	6.87	2.74	19810.00
120	7.05	0.17	10.28	88.0%	20.25	9.89	113.2	20.5	98.9%	82.9%	82.0%	11.3	7.05	54.27	5.67	54.27	8854	4.06	6.87	2.74	19810.00
130	6.48	0.17	11.04	75.2%	20.20	9.07	109.6	20.2	99.0%	83.5%	82.6%	10.6	6.48	57.92	5.21	57.92	8564	4.06	6.87	2.74	19810.00
140	5.97	0.12	11.09	75.2%	20.20	9.05	105.9	20.8	99.3%	83.8%	83.3%	10.6	5.97	61.25	4.80	61.25	8203	4.06	6.87	2.74	19810.00
150	5.45	0.12	11.07	75.5%	20.20	9.07	104.6	20.6	99.3%	83.9%	83.3%	10.6	5.45	64.61	4.39	64.61	7878	4.06	6.87	2.74	19810.00
160	4.98	0.12	9.29	108.7%	20.32	10.97	105.2	20.7	99.3%	83.0%	82.4%	12.6	4.98	67.67	4.01	67.67	6721	4.06	6.87	2.74	19810.00
170	4.61	0.16	8.40	129.5%	20.37	11.89	94.8	20.8	98.8%	83.2%	82.3%	13.8	4.61	70.08	3.71	70.08	5890	4.06	6.87	2.74	19810.00
180	4.24	1.18	4.97	219.4%	20.53	14.97	89.3	20.6	84.8%	79.5%	67.4%	18.7	4.24	72.47	3.41	72.47	4987	4.06	6.87	2.74	19810.00
190	3.98	1.18	5.13	211.3%	20.52	14.80	75.0	20.3	85.1%	81.4%	69.3%	18.2	3.98	74.15	3.20	74.15	5710	4.06	6.87	2.74	19810.00
200	3.53	1.06	5.19	214.3%	20.53	14.81	70.3	19.8	86.6%	82.1%	71.1%	18.4	3.53	77.12	2.83	77.12	3722	4.06	6.87	2.74	19810.00
210	3.52	1.26	5.11	208.4%	20.52	14.78	68.4	20.0	84.3%	82.1%	69.2%	18.0	3.52	77.18	2.83	77.18	3216	4.06	6.87	2.74	19810.00
220	3.12	1.20	5.07	213.3%	20.53	14.86	66.8	19.4	84.8%	82.2%	69.7%	18.3	3.12	79.74	2.51	79.74	3397	4.06	6.87	2.74	19810.00
230	3.09	1.04	4.85	233.5%	20.55	15.18	65.6	19.7	86.0%	82.3%	70.8%	19.5	3.09	79.95	2.48	79.95	2999	4.06	6.87	2.74	19810.00
240	2.75	0.35	5.28	248.9%	20.57	15.11	64.3	19.2	95.5%	83.5%	79.8%	20.9	2.75	82.18	2.21	82.18	2999	4.06	6.87	2.74	19810.00
250	2.71	0.39	4.84	275.6%	20.59	15.56	131.1	19.7	94.6%	74.2%	70.2%	22.4	2.71	82.39	2.18	82.39	434	4.06	6.87	2.74	19810.00
260	2.69	0.36	4.66	291.3%	20.61	15.77	149.1	20.4	94.9%	71.4%	67.7%	23.4	2.69	82.54	2.16	82.54	2240	4.06	6.87	2.74	19810.00
270	2.43	0.35	4.77	283.7%	20.60	15.66	142.8	20.4	95.1%	72.6%	69.0%	22.9	2.43	84.22	1.96	84.22	3541	4.06	6.87	2.74	19810.00
280	2.25	0.49	4.38	303.3%	20.62	15.99	140.5	20.4	92.5%	71.5%	66.1%	24.0	2.25	85.42	1.81	85.42	2891	4.06	6.87	2.74	19810.00
290	2.07	0.35	4.39	314.4%	20.63	16.06	140.1	20.4	94.7%	71.7%	67.9%	24.8	2.07	86.57	1.66	86.57	2963	4.06	6.87	2.74	19810.00
300	1.87	0.29	3.97	361.1%	20.66	16.54	137.1	20.5	95.4%	70.5%	67.3%	27.6	1.87	87.84	1.51	87.84	2710	4.06	6.87	2.74	19810.00
310	1.73	0.30	3.82	376.8%	20.67	16.70	135.8	20.5	95.0%	70.0%	66.6%	28.5	1.73	88.78	1.39	88.78	3216	4.06	6.87	2.74	19810.00
320	1.47	0.37	3.43	416.9%	20.69	17.07	130.5	19.7	93.1%	68.9%	64.1%	30.8	1.47	90.46	1.18	90.46	4445	4.06	6.87	2.74	19810.00
330	1.17	0.36	3.34	430.9%	20.70	17.18	128.9	19.7	93.1%	68.7%	63.9%	31.6	1.17	92.40	0.94	92.40	1915	4.06	6.87	2.74	19810.00
340	1.23	0.30	3.28	448.7%	20.70	17.27	123.1	20.1	94.3%	69.5%	65.6%	32.8	1.23	92.02	0.99	92.02	2783	4.06	6.87	2.74	19810.00
350	0.82	0.28	3.31	447.2%	20.70	17.25	121.2	19.5	94.8%	69.9%	66.3%	32.7	0.82	94.67	0.66	94.67	2710	4.06	6.87	2.74	19810.00
360	0.89	0.28	3.15	472.7%	20.71	17.42	118.0	19.9	94.6%	69.8%	66.0%	34.2	0.89	94.23	0.72	94.23	2096	4.06	6.87	2.74	19810.00
370	0.56	0.27	3.06	489.9%	20.72	17.53	118.4	19.5	94.7%	69.1%	65.4%	35.3	0.56	96.38	0.45	96.38	2421	4.06	6.87	2.74	19810.00
380	0.59	0.26	2.80	541.9%	20.74	17.81	116.3	19.3	94.5%	67.8%	64.0%	38.4	0.59	96.20	0.47	96.20	1445	4.06	6.87	2.74	19810.00
390	0.38	0.26	2.78	546.2%	20.74	17.83	116.1	19.6	94.5%	67.7%	64.0%	38.6	0.38	97.56	0.30	97.56	2638	4.06	6.87	2.74	19810.00
400	0.25	0.21	2.63	591.7%	20.75	18.02	114.3	19.1	95.6%	66.9%	64.0%	41.5	0.25	98.35	0.20	98.35	759	4.06	6.87	2.74	19810.00
410	0.28	0.20	2.46	638.5%	20.76	18.20	110.9	19.5	95.6%	66.4%	63.5%	44.3	0.28	98.17	0.23	98.17	4264	4.06	6.87	2.74	19810.00
420	-0.03	0.23	2.31	673.3%	20.77	18.35	109.0	19.3	94.4%	65.5%	61.9%	46.3	-0.03	100.21	-0.03	100.21	1951	4.06	6.87	2.74	19810.00
430	0.04	0.21	2.26	695.3%	20.78	18.41	107.5	19.3	95.0%	65.4%	62.1%	47.7	0.04	99.76	0.03	99.76	36	4.06	6.87	2.74	19810.00

Appendix G Stack Loss Efficiency (page 16 of 20)

Moisture Content M_{Cwb}: 19.59

94.88%
245 443 232 791 (Btu)
184 773 175 248 (Btu)
75.28%
945.64

Moisture of Wood (wet basis): 19.59
Initial Dry Weight Wt_{do} (kg): 12.39
Moisture Content Dry 24.36

Dry kg : 12.39
CA: 48.73
HY: 6.87
OX: 43.9

Load Weight (kg): **15.41**

Fuel Heating	HHV	LHV		HHV	LHV
Value in kJ/kg - CV:	**19 810**	**18 329**	Btu/lb	**8522.5**	**7885.2**

19.59	79.27	21.03	1.66	5.60	0.04	0.16	37.27	121.34	3.26	0.28	616.16	33.96	13.53	386.12	3672.25	2777.97	2704.89	2674.17	3503.70	3237.96	293.11	6074.04	14985.46
Mw Moisture	Mass Balance (moles/100 mole dry flue gas)					kg Wood per 100 mole dfp	Moles per kg of Dry Wood						Moisture	Stack Temp	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp		
Fuel Burnt	[h]	[u]	[w]	[j]	[k]	Nk	CO_2	O_2	CO	HC	N_2	H_2O	Present	K	CO_2	O_2	CO	N_2	CH_4	H_2O	K	CO_2	O_2
19.59	79.17	21.00	1.22	4.10	0.04	0.12	36.95	131.70	3.55	0.31	654.45	33.91	13.53	372.89	3190.42	2424.73	2363.69	2336.27	3019.36	2830.39	291.45	117.89	319.33
19.59	79.66	21.13	3.16	10.73	0.06	0.31	39.07	24.09	1.56	0.19	253.41	34.15	13.53	461.53	6833.74	5094.71	4942.40	4890.10	6683.98	5910.61	292.69	266.96	122.72
19.59	79.01	20.96	1.25	4.13	0.09	0.12	33.94	128.34	6.18	0.69	633.91	33.13	13.53	377.82	3294.77	2499.97	2436.06	2408.00	3127.00	2916.73	293.94	111.82	320.84
19.59	79.20	21.01	1.98	6.61	0.09	0.20	36.43	65.35	3.91	0.47	402.45	33.59	13.53	364.54	2797.88	2129.60	2076.77	2052.52	2640.85	2487.06	292.94	101.94	139.17
19.59	79.51	21.09	2.34	7.97	0.03	0.23	39.12	47.34	1.55	0.15	341.39	34.22	13.53	383.09	3540.60	2683.91	2614.66	2584.68	3366.00	3130.37	293.11	138.50	127.05
19.59	79.46	21.08	2.23	7.57	0.04	0.22	38.93	52.10	1.72	0.17	358.88	34.19	13.53	392.88	3949.63	2987.78	2909.17	2876.14	3768.41	3482.49	292.85	153.76	155.66
19.59	79.27	21.03	2.00	6.73	0.07	0.20	37.23	63.70	3.22	0.37	398.29	33.79	13.53	377.07	3309.20	2511.99	2448.02	2419.78	3138.37	2931.14	292.76	123.20	160.02
19.59	79.50	21.09	3.38	11.38	0.12	0.34	37.71	20.43	2.73	0.37	236.09	33.79	13.53	401.90	4313.98	3256.93	3169.67	3134.00	4130.19	3793.83	293.01	162.70	66.55
19.59	79.68	21.13	2.95	10.06	0.04	0.29	39.53	28.56	1.16	0.12	271.53	34.28	13.53	397.22	4113.35	3108.46	3025.91	2991.70	3931.56	3621.98	293.22	162.60	88.79
19.59	79.63	21.12	3.04	10.31	0.06	0.30	39.00	26.83	1.62	0.19	263.59	34.14	13.53	399.61	4196.28	3169.23	3084.60	3049.83	4014.99	3692.09	293.62	163.64	85.03
19.59	79.60	21.11	3.07	10.41	0.07	0.31	38.75	26.19	1.83	0.23	260.54	34.07	13.53	402.16	4303.58	3248.52	3161.35	3125.80	4121.47	3783.82	293.56	166.78	85.08
19.59	79.58	21.11	2.58	8.80	0.03	0.26	39.36	38.81	1.32	0.13	309.81	34.26	13.53	394.51	3987.13	3014.58	2934.89	2901.64	3807.61	3513.16	293.62	156.93	117.01
19.59	79.66	21.13	2.58	8.83	0.01	0.26	40.11	38.57	0.66	0.03	310.87	34.45	13.53	386.35	3650.69	2765.05	2693.14	2662.38	3475.72	3224.15	293.69	146.45	106.66
19.59	79.72	21.14	2.76	9.47	0.01	0.27	40.16	33.01	0.62	0.04	289.96	34.45	13.53	382.73	3514.94	2664.49	2595.76	2565.99	3341.50	3107.74	293.39	141.15	87.95
19.59	79.74	21.15	2.76	9.48	0.00	0.27	40.36	32.94	0.44	0.01	290.24	34.50	13.53	379.04	3343.23	2536.05	2471.05	2442.62	3174.51	2958.56	293.97	134.95	83.54
19.59	79.74	21.15	2.76	9.46	0.00	0.27	40.36	33.08	0.44	0.01	290.75	34.50	13.53	377.71	3296.81	2501.68	2437.76	2409.68	3128.59	2918.78	293.77	133.07	82.75
19.59	79.62	21.12	2.32	7.96	0.00	0.23	40.29	47.57	0.52	0.00	345.33	34.52	13.53	378.33	3317.57	2517.03	2452.62	2424.39	3149.18	2936.54	293.88	133.67	119.74
19.59	79.55	21.10	2.11	7.24	0.00	0.21	40.03	56.68	0.76	0.02	379.07	34.48	13.53	367.96	2896.83	2202.77	2147.62	2122.64	2738.92	2571.74	293.94	115.96	124.86
19.59	78.88	20.92	1.55	5.03	0.15	0.15	32.21	97.04	7.65	0.96	511.14	32.61	13.53	362.45	2683.71	2043.28	1992.74	1969.43	2531.81	2386.47	293.73	86.43	198.27
19.59	78.89	20.92	1.59	5.17	0.15	0.16	32.42	93.55	7.46	0.94	498.52	32.65	13.53	348.13	2122.58	1621.26	1582.42	1563.65	1991.05	1895.49	293.49	68.81	151.67
19.59	78.94	20.94	1.57	5.14	0.13	0.16	33.20	94.71	6.78	0.84	504.94	32.85	13.53	343.47	1959.29	1498.27	1462.79	1445.35	1834.07	1752.32	292.93	65.04	141.90
19.59	78.85	20.92	1.61	5.20	0.16	0.16	31.94	92.37	7.88	1.00	492.82	32.52	13.53	341.52	1874.50	1433.98	1400.17	1383.45	1753.49	1677.34	293.14	59.87	132.46
19.59	78.87	20.92	1.58	5.13	0.15	0.16	32.23	94.43	7.63	0.96	501.33	32.60	13.53	339.96	1835.77	1405.04	1372.07	1355.65	1715.78	1643.73	292.54	59.16	132.67
19.59	78.93	20.94	1.48	4.84	0.13	0.15	32.90	102.97	7.05	0.86	535.35	32.80	13.53	338.70	1774.70	1358.59	1326.78	1310.88	1658.07	1589.50	292.84	58.38	139.89
19.59	79.26	21.02	1.39	4.73	0.03	0.14	38.09	109.04	2.53	0.19	571.83	34.14	13.53	337.46	1743.49	1335.20	1304.06	1288.41	1627.79	1562.32	292.37	66.42	145.59
19.59	79.21	21.01	1.30	4.39	0.03	0.13	37.54	120.69	3.02	0.25	614.38	34.03	13.53	404.21	4415.37	3331.95	3242.30	3205.89	4230.62	3880.64	292.84	165.76	402.12
19.59	79.21	21.01	1.24	4.22	0.03	0.12	37.68	127.51	2.91	0.22	640.53	34.08	13.53	422.20	5134.86	3859.38	3751.74	3710.41	4953.99	4489.17	293.57	193.49	492.11
19.59	79.22	21.01	1.27	4.30	0.03	0.13	37.83	124.18	2.78	0.20	628.33	34.11	13.53	415.96	4877.28	3670.72	3569.56	3529.98	4694.66	4271.56	293.50	184.52	455.82
19.59	79.14	20.99	1.21	4.07	0.05	0.12	36.36	132.79	4.07	0.38	657.03	33.76	13.53	413.66	4780.19	3599.39	3500.62	3461.72	4597.39	4189.20	293.54	173.83	477.95
19.59	79.20	21.01	1.17	3.98	0.03	0.12	37.60	137.57	3.00	0.22	678.31	34.09	13.53	413.22	4761.95	3586.00	3487.68	3448.91	4579.08	4173.75	293.53	179.04	493.31
19.59	79.20	21.01	1.05	3.59	0.02	0.10	37.89	157.91	2.77	0.15	755.95	34.22	13.53	410.23	4634.80	3492.42	3397.20	3359.32	4452.05	4065.64	293.62	175.63	551.50
19.59	79.18	21.00	1.02	3.47	0.02	0.10	37.69	164.73	2.96	0.17	781.17	34.19	13.53	408.98	4582.81	3454.17	3360.22	3322.71	4400.10	4021.46	293.62	172.71	569.02
19.59	79.13	20.99	0.94	3.18	0.03	0.09	36.58	182.11	3.95	0.28	843.94	33.96	13.53	403.61	4388.73	3312.23	3223.21	3187.00	4204.26	3857.82	292.89	160.56	603.19
19.59	79.12	20.99	0.92	3.10	0.02	0.09	36.60	188.19	3.94	0.27	866.95	33.98	13.53	402.06	4328.20	3267.71	3180.17	3144.38	4143.73	3806.39	292.80	158.39	614.95
19.59	79.15	20.99	0.89	3.01	0.02	0.09	37.23	196.05	3.40	0.18	898.28	34.16	13.53	396.21	4072.69	3078.42	2996.84	2962.93	3891.19	3587.24	293.20	151.61	603.52
19.59	79.16	21.00	0.89	3.02	0.01	0.09	37.49	195.43	3.17	0.15	896.62	34.23	13.53	394.31	4016.75	3037.77	2957.66	2924.11	3834.16	3540.47	292.62	150.60	593.66
19.59	79.15	20.99	0.85	2.89	0.01	0.08	37.34	206.55	3.32	0.15	938.24	34.22	13.53	391.10	3869.70	2928.33	2851.54	2819.10	3689.93	3413.58	293.03	144.50	604.84
19.59	79.14	20.99	0.82	2.80	0.01	0.08	37.38	214.07	3.30	0.14	966.76	34.25	13.53	391.55	3903.11	2953.57	2876.11	2843.40	3721.86	3442.99	292.64	145.89	632.27
19.59	79.13	20.99	0.76	2.58	0.01	0.08	37.23	236.80	3.46	0.12	1052.23	34.28	13.53	389.49	3825.43	2896.19	2820.58	2788.42	3644.71	3376.62	292.47	142.43	685.81
19.59	79.13	20.99	0.75	2.56	0.01	0.07	37.21	238.64	3.48	0.12	1059.13	34.28	13.53	389.27	3806.85	2882.11	2806.86	2774.86	3627.05	3360.20	292.72	141.65	687.78
19.59	79.14	20.99	0.70	2.40	0.00	0.07	37.77	258.77	3.02	0.02	1136.67	34.48	13.53	387.40	3746.74	2838.01	2764.26	2732.67	3566.69	3309.31	292.29	141.53	734.40
19.59	79.14	20.99	0.66	2.25	0.00	0.07	37.75	279.32	3.07	0.00	1214.24	34.53	13.53	384.04	3596.12	2725.70	2655.30	2624.87	3419.42	3179.00	292.66	135.74	761.35
19.59	79.11	20.98	0.63	2.14	0.00	0.06	37.06	294.34	3.69	0.06	1269.17	34.39	13.53	382.12	3527.70	2675.11	2606.33	2576.39	3351.59	3120.47	292.40	130.73	787.39
19.59	79.12	20.99	0.61	2.09	0.00	0.06	37.33	304.10	3.47	0.02	1306.76	34.49	13.53	380.62	3464.92	2628.32	2560.94	2531.49	3290.13	3066.20	292.46	129.34	799.28

Appendix G Stack Loss Efficiency (page 17 of 20)

SUMS					AVERAGE	SUMS						
40972.41	73157.96	11013.61	70554.81	28113.44	5565.27	60669.99	12564.63	48105.4	186760.5	12564.6	945.6	54.1
Energy Losses (kJ/kg of Dry Fuel)					Total							
Flue Gas Constituent					Loss	Total	Chemical	Sensible and	Total	Chem	Grams Produced	
CO	N_2	CH_4	H_2O Comb	H_2O Fuel MC	Rate	Loss	Loss 1	Latent Loss	Output	Loss 2	CO	HC
1014.24	1528.98	273.55	1586.97	633.43	5474.38	0.00	0	0.00	0	0	0.00	0.00
448.83	1239.19	169.03	1703.17	675.12	4625.02	4800.59	632	4168.58	15761	632	45.30	3.13
1763.44	1526.46	620.04	1553.53	634.59	6530.73	3919.46	1420	2499.33	7970	1420	103.82	6.67
1115.41	826.04	415.34	1560.56	628.78	4787.24	2279.26	724	1554.91	7153	724	52.16	3.54
441.49	882.38	133.28	1611.94	637.49	3972.14	1927.41	277	1650.71	7685	277	21.00	1.16
490.66	1032.18	148.70	1622.36	642.25	4245.57	2517.03	376	2141.31	9228	376	28.49	1.58
917.86	963.77	327.17	1584.76	634.79	4711.57	2561.24	672	1889.34	8208	672	48.94	3.19
781.83	739.90	326.75	1613.99	646.47	4338.19	2287.05	579	1707.98	8157	579	40.33	3.08
331.40	812.34	109.92	1631.26	644.14	3780.45	2255.07	261	1994.20	9562	261	19.35	1.17
464.05	803.92	172.83	1626.96	645.09	3961.52	2399.21	382	2017.00	9598	382	27.51	1.87
524.51	814.40	201.26	1627.06	646.33	4065.42	2284.15	404	1880.15	8846	404	28.84	2.02
378.46	898.94	116.66	1626.82	642.67	3937.48	1874.68	234	1641.03	7557	234	17.65	0.99
189.52	827.65	30.96	1625.96	638.75	3565.93	1593.70	98	1496.02	7260	98	8.30	0.25
176.60	744.03	33.09	1621.73	637.18	3441.72	1487.96	90	1398.06	7077	90	7.49	0.26
124.68	708.94	9.53	1619.06	635.16	3315.86	1373.06	55	1317.95	6830	55	5.06	0.07
124.89	700.61	9.44	1617.70	634.62	3303.08	1313.54	53	1260.56	6564	53	4.87	0.07
148.56	837.22	-0.60	1619.36	634.86	3492.83	1185.11	50	1135.34	5536	50	4.94	0.00
217.41	804.63	17.81	1604.85	629.92	3515.45	1045.29	69	975.85	4845	69	6.35	0.09
2179.22	1006.66	855.68	1511.44	627.42	6465.12	1627.51	760	867.96	3359	760	53.90	3.86
2122.07	779.52	835.48	1497.46	620.77	6075.78	1751.17	848	902.68	3958	848	60.18	4.32
1928.61	729.81	745.65	1501.98	618.83	5731.83	1076.96	500	576.64	2645	500	35.67	2.51
2239.63	681.79	891.31	1484.60	617.82	6107.48	991.56	506	485.32	2225	506	35.80	2.60
2168.93	679.62	856.11	1487.10	617.36	6000.96	1029.00	517	512.37	2368	517	36.62	2.63
2005.58	701.78	769.26	1494.20	616.63	5785.72	876.00	418	457.50	2123	418	29.90	2.09
717.91	736.75	171.81	1554.32	616.26	4009.06	607.00	134	472.84	2392	134	10.71	0.47
865.85	1969.64	220.71	1628.28	647.64	5900.00	129.15	24	105.60	304	24	1.85	0.09
834.73	2376.62	196.21	1651.66	655.88	6400.69	723.91	115	608.67	1517	115	9.22	0.40
795.47	2218.00	183.31	1645.63	652.93	6135.68	1096.87	173	923.84	2445	173	13.89	0.59
1165.52	2274.45	339.45	1626.01	651.82	6709.02	979.08	217	761.78	1912	217	16.62	0.89
858.77	2339.42	192.94	1641.25	651.61	6356.35	950.80	156	795.20	2012	156	12.56	0.52
792.77	2539.49	133.69	1643.92	650.14	6487.15	887.53	125	762.16	1823	125	10.60	0.33
847.51	2595.61	148.85	1640.79	649.55	6624.03	1075.43	160	915.40	2141	160	13.45	0.43
1129.51	2689.64	252.45	1624.11	647.33	7106.78	1594.58	307	1287.63	2850	307	24.79	1.01
1128.80	2726.02	243.43	1623.32	646.64	7141.55	690.46	131	559.11	1225	131	10.68	0.42
973.76	2661.53	161.74	1624.56	643.67	6820.39	958.01	158	800.04	1825	158	13.39	0.41
906.92	2621.83	132.22	1626.10	643.04	6674.37	913.15	141	772.34	1797	141	12.15	0.32
948.79	2645.00	135.45	1621.41	641.32	6741.30	713.25	114	599.59	1383	114	9.83	0.26
942.81	2748.87	121.87	1623.86	641.72	6857.30	838.10	129	709.20	1583	129	11.29	0.27
988.13	2934.08	109.93	1622.85	640.82	7124.04	519.82	79	440.44	926	79	7.06	0.14
994.58	2938.94	110.24	1622.25	640.60	7136.03	950.27	146	804.51	1688	146	12.98	0.26
861.87	3106.15	20.84	1629.97	639.91	7134.67	273.31	33	239.82	486	33	3.24	0.01
876.59	3187.22	-1.85	1627.87	638.14	7225.07	1555.22	187	1368.68	2709	187	18.50	-0.01
1053.80	3269.88	57.46	1619.60	637.35	7556.20	744.33	108	635.83	1207	108	10.18	0.10
990.44	3308.06	14.60	1622.24	636.62	7500.57	13.68	2	11.87	22	2	0.18	0.00

Appendix G Stack Loss Efficiency (page 18 of 20)

Manufacturer: SBI
Model: Caddy B415.1
Date: 02-03-15
Run: 6
Control #:
Test Duration: 260 min

	HHV	LHV
Eff	71.72%	77.51%
Comb Eff	95.99%	95.99%
HT Eff	74.71%	80.75%
Output	39 792	kJ/h
Burn Rate	2.80	kg/h
Grams CO	749	g
Input	55 485	kJ/h
MC wet	19.79	

Note: In the "Input data", "Calc. % O_2", "Fuel Properties", and "Mass Balance" columns, [e], [d], [g], [a], [b], [c], [h], [u], [w], [j], and [k] refer to their respective variables in Clauses 13.7.3 to 13.7.5.

Ultimate CO_2
$CO_{2\text{-ult}}$ 19.64
F_0
1.060

Overall Heating Efficiency:	71.72%	Air Fuel Ratio (A/F)			
Combustion Efficiency:	95.99%	Dry Molecular Weight (M_d)	29.63		
Heat Transfer Efficiency:	74.71%	Dry Moles Exhaust Gas (N_d):	503.69	%HC	Combustion Efficiency:
		Air Fuel Ratio (A/F)	14.41	1.32	Total Input (kJ):
					Total Output (kJ):
					Efficiency:
					Total CO (g):

Heat Output:	37 747	Btu/h	39 792	kJ/h
Heat Input:	52 633	Btu/h	55 485	kJ/h
Burn Duration:	4.33	h		
Burn Rate:	6.17	lb/h	2.801	kg/h
Stack Temp:	306.7	Deg. F	152.6	Deg. C

Elapsed Time	Weight Remaining (kg)	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (°C)	Room Temp (°C)	Combust Eff %	Heat Transfer %	Net Eff %	Air Fuel Ratio	Wet Wt Now Wt	% Wet Consumed x	Dry Wt. Now Wt_{dry}	% Dry Comsumed y	Total Input	Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value
Averages		0.31	6.81	2.48	20.47	13.51	153.34	20.22	96.1%	72.8%	70.2%	20.81	5.37	64.50	4.31	64.50	241624	4.06	6.87	2.74	19810.00
	INPUT DATA			Oxygen Calculation			Input Data		Combust	Heat	Net	Air	Wet Wt	% Wet	Dry Wt.	% Dry		Fuel Properties			
0	15.13	0.72	3.72	342.4%	20.65	16.57	172.7	19.9	87.5%	63.1%	55.3%	26.0	15.13	0.00	12.14	0.00	0	4.06	6.87	2.74	19810.00
10	13.38	0.58	5.75	210.3%	20.52	14.48	139.9	19.8	93.0%	75.2%	69.9%	18.5	13.38	11.60	10.73	11.60	33704	4.06	6.87	2.74	19810.00
20	12.65	0.06	13.85	41.2%	20.02	6.14	124.7	19.4	99.8%	83.6%	83.4%	8.6	12.65	16.43	10.14	16.43	15572	4.06	6.87	2.74	19810.00
30	11.42	0.72	4.39	284.4%	20.60	15.85	234.2	20.3	89.1%	57.8%	51.5%	22.7	11.42	24.56	9.16	24.56	14960	4.06	6.87	2.74	19810.00
40	10.76	0.33	9.78	94.3%	20.27	10.33	103.0	21.1	97.5%	83.3%	81.2%	11.7	10.76	28.88	8.63	28.88	9949	4.06	6.87	2.74	19810.00
50	10.16	0.28	15.66	23.2%	19.89	4.09	157.3	19.9	98.6%	82.5%	81.3%	7.5	10.16	32.83	8.15	32.83	14203	4.06	6.87	2.74	19810.00
60	8.97	0.54	7.38	148.0%	20.42	12.77	248.6	20.6	94.7%	68.0%	64.4%	14.8	8.97	40.69	7.20	40.69	18024	4.06	6.87	2.74	19810.00
70	7.89	0.88	7.16	144.3%	20.41	12.81	138.3	20.4	91.3%	77.7%	71.0%	14.5	7.89	47.83	6.33	47.83	13049	4.06	6.87	2.74	19810.00
80	7.33	0.40	9.70	94.5%	20.27	10.37	98.3	19.9	96.9%	83.5%	80.9%	11.7	7.33	51.54	5.88	51.54	9589	4.06	6.87	2.74	19810.00
90	6.69	0.32	13.96	37.6%	20.00	5.88	102.2	19.8	98.2%	84.8%	83.3%	8.3	6.69	55.80	5.36	55.80	11535	4.06	6.87	2.74	19810.00
100	5.88	0.32	10.16	87.4%	20.25	9.93	230.6	20.4	97.7%	74.4%	72.7%	11.3	5.88	61.14	4.72	61.14	12977	4.06	6.87	2.74	19810.00
110	5.05	0.44	6.87	168.7%	20.46	13.37	134.3	20.6	95.4%	78.0%	74.4%	16.1	5.05	66.60	4.05	66.60	10273	4.06	6.87	2.74	19810.00
120	4.59	0.07	8.54	128.1%	20.37	11.80	94.4	20.5	99.7%	83.3%	83.1%	13.8	4.59	69.69	3.68	69.69	6849	4.06	6.87	2.74	19810.00
130	4.19	0.06	8.65	125.5%	20.36	11.68	139.2	20.1	99.8%	79.8%	79.6%	13.6	4.19	72.29	3.36	72.29	5623	4.06	6.87	2.74	19810.00
140	3.88	0.05	6.99	179.0%	20.48	13.46	180.2	20.5	100.0%	73.9%	73.8%	16.9	3.88	74.36	3.11	74.36	6488	4.06	6.87	2.74	19810.00
150	3.38	0.07	6.43	202.2%	20.51	14.05	191.4	20.7	99.7%	71.5%	71.3%	18.2	3.38	77.69	2.71	77.69	7786	4.06	6.87	2.74	19810.00
160	2.90	0.09	6.01	222.0%	20.54	14.48	182.2	20.8	99.4%	71.4%	71.0%	19.4	2.90	80.84	2.33	80.84	7318	4.06	6.87	2.74	19810.00
170	2.45	0.19	5.53	243.4%	20.56	14.94	174.0	20.8	97.9%	71.0%	69.6%	20.6	2.45	83.78	1.97	83.78	6777	4.06	6.87	2.74	19810.00
180	2.05	0.17	5.60	240.4%	20.56	14.87	170.1	20.5	98.3%	71.6%	70.4%	20.5	2.05	86.48	1.64	86.48	5732	4.06	6.87	2.74	19810.00
190	1.73	0.18	5.28	259.8%	20.58	15.21	160.1	20.5	98.0%	71.9%	70.5%	21.6	1.73	88.55	1.39	88.55	4830	4.06	6.87	2.74	19810.00
200	1.44	0.25	4.59	305.8%	20.62	15.91	157.0	20.2	96.6%	70.0%	67.6%	24.3	1.44	90.49	1.15	90.49	4686	4.06	6.87	2.74	19810.00
210	1.14	0.28	3.80	381.4%	20.67	16.73	153.2	20.1	95.4%	67.0%	63.9%	28.8	1.14	92.44	0.92	92.44	5659	4.06	6.87	2.74	19810.00
220	0.73	0.32	3.10	474.4%	20.71	17.45	149.3	20.0	93.6%	63.2%	59.1%	34.3	0.73	95.20	0.58	95.20	4290	4.06	6.87	2.74	19810.00
230	0.60	0.32	3.11	472.7%	20.71	17.44	137.5	20.1	93.6%	65.6%	61.4%	34.2	0.60	96.01	0.48	96.01	1983	4.06	6.87	2.74	19810.00
240	0.48	0.27	2.70	561.4%	20.74	17.91	125.2	20.0	94.1%	65.1%	61.3%	39.5	0.48	96.85	0.38	96.85	3605	4.06	6.87	2.74	19810.00
250	0.15	0.24	2.61	589.2%	20.75	18.02	121.9	19.7	94.7%	65.1%	61.6%	41.3	0.15	99.01	0.12	99.01	4975	4.06	6.87	2.74	19810.00
260	0.00	0.22	2.49	624.8%	20.76	18.16	120.1	19.5	95.1%	64.4%	61.2%	43.4	0.00	100.00	0.00	100.00	1190	4.06	6.87	2.74	19810.00

Appendix G Stack Loss Efficiency (page 19 of 20)

Moisture Content M_{Cwb}: 19.79

95.99%
240 435 228 041 (Btu)
172 433 163 544 (Btu)
71.72%
749.21

Moisture of Wood (wet basis): 19.79
Initial Dry Weight Wt_{do} (kg): 12.14
Moisture Content Dry 24.67

Dry kg : 12.14
CA: 48.73
HY: 6.87
OX: 43.9

Load Weight (kg): **15.13**

Fuel Heating	HHV	LHV		HHV	LHV
Value in kJ/kg - CV:	**19 810**	**18 329**	Btu/lb	**8522.5**	**7885.2**

19.79	79.37	21.05	1.76	5.99	0.02	0.17	38.43	108.42	2.23	0.15	570.38	34.22	13.71	426.49	5344.66	4003.55	3888.56	3846.43	5185.99	4651.83	293.37	5532.47	11540.95
Mw Moisture	Mass Balance (moles/100 mole dry flue gas)					kg Wood per 100 mole dfp	Moles per kg of Dry Wood						Moisture	Stack Temp	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp		
Fuel Burnt	[h]	[u]	[w]	[j]	[k]	Nk	CO_2	O_2	CO	HC	N_2	H_2O	Present	K	CO_2	O_2	CO	N_2	CH_4	H_2O	K	CO_2	O_2
19.79	78.99	20.95	1.11	3.67	0.08	0.11	33.60	149.64	6.50	0.71	713.52	33.11	13.71	445.86	6152.32	4601.51	4467.61	4419.57	5985.08	5343.98	293.02	206.73	688.58
19.79	79.19	21.00	1.57	5.28	0.06	0.16	36.72	92.48	3.70	0.39	505.67	33.74	13.71	413.09	4777.78	3598.44	3499.92	3460.98	4593.15	4188.43	292.98	175.43	332.78
19.79	79.95	21.21	3.43	11.77	0.00	0.34	40.64	18.02	0.18	0.00	234.59	34.53	13.71	397.87	4164.13	3146.82	3063.25	3028.63	3980.12	3666.68	292.59	169.23	56.71
19.79	79.04	20.96	1.28	4.23	0.08	0.13	34.53	124.67	5.66	0.62	621.59	33.27	13.71	507.37	8804.79	6501.32	6291.35	6228.07	8749.50	7518.86	293.41	303.99	810.54
19.79	79.56	21.10	2.50	8.52	0.03	0.25	39.36	41.56	1.33	0.13	320.18	34.27	13.71	376.10	3212.17	2438.03	2375.88	2348.48	3046.99	2844.73	294.28	126.42	101.33
19.79	79.97	21.21	3.93	13.44	0.03	0.39	40.01	10.44	0.72	0.09	204.32	34.35	13.71	430.42	5499.27	4126.50	4009.74	3965.92	5320.38	4797.35	293.04	220.02	43.09
19.79	79.31	21.04	1.96	6.63	0.06	0.20	37.75	65.31	2.76	0.30	405.73	33.93	13.71	521.72	9428.41	6940.97	6711.59	6645.18	9414.79	8019.42	293.78	355.95	453.31
19.79	79.15	20.99	2.01	6.68	0.11	0.20	35.87	64.16	4.41	0.54	396.47	33.44	13.71	411.46	4687.59	3531.31	3434.82	3396.56	4504.73	4110.59	293.57	168.12	226.58
19.79	79.53	21.09	2.50	8.50	0.04	0.25	39.04	41.74	1.61	0.17	320.04	34.19	13.71	371.47	3073.49	2335.79	2276.98	2250.57	2908.85	2726.55	293.01	119.97	97.51
19.79	79.84	21.18	3.53	12.04	0.04	0.35	39.79	16.75	0.91	0.11	227.60	34.31	13.71	375.36	3233.45	2455.30	2392.98	2365.33	3064.74	2865.30	292.94	128.67	41.13
19.79	79.59	21.11	2.59	8.83	0.03	0.26	39.45	38.55	1.24	0.12	309.05	34.28	13.71	503.77	8640.38	6384.44	6179.38	6116.98	8576.23	7385.39	293.55	340.87	246.12
19.79	79.32	21.04	1.81	6.13	0.04	0.18	38.13	74.20	2.44	0.24	440.30	34.05	13.71	407.43	4515.73	3404.68	3312.34	3275.31	4333.36	3964.24	293.71	172.20	252.62
19.79	79.59	21.11	2.12	7.29	-0.01	0.21	40.52	55.97	0.33	-0.04	377.67	34.61	13.71	367.58	2892.85	2200.07	2145.06	2120.10	2734.46	2568.70	293.65	117.22	123.15
19.79	79.61	21.12	2.14	7.38	-0.01	0.21	40.58	54.82	0.28	-0.05	373.44	34.62	13.71	412.35	4737.60	3568.56	3470.94	3432.30	4553.71	4153.78	293.23	192.24	195.61
19.79	79.50	21.09	1.73	5.97	-0.01	0.17	40.61	78.19	0.29	-0.08	461.82	34.69	13.71	453.37	6450.18	4816.07	4673.90	4624.07	6292.82	5590.09	293.60	261.91	376.57
19.79	79.45	21.08	1.60	5.51	-0.01	0.16	40.45	88.36	0.44	-0.08	499.83	34.68	13.71	464.57	6922.25	5156.24	5000.97	4948.29	6780.34	5980.31	293.80	280.01	455.60
19.79	79.42	21.07	1.50	5.17	-0.01	0.15	40.28	97.06	0.60	-0.07	532.24	34.66	13.71	455.39	6523.67	4868.53	4724.21	4673.97	6369.80	5650.07	293.94	262.76	472.52
19.79	79.34	21.05	1.41	4.83	0.00	0.14	39.43	106.51	1.35	0.03	565.75	34.47	13.71	447.12	6170.18	4612.73	4477.97	4429.93	6007.14	5356.21	293.96	243.30	491.30
19.79	79.36	21.05	1.42	4.88	0.00	0.14	39.60	105.19	1.20	0.01	561.22	34.51	13.71	443.29	6021.22	4505.34	4374.70	4327.56	5853.42	5232.99	293.60	238.47	473.92
19.79	79.33	21.04	1.34	4.62	0.00	0.13	39.45	113.65	1.35	0.01	592.79	34.50	13.71	433.28	5598.04	4197.57	4078.05	4033.64	5422.60	4878.84	293.61	220.87	477.06
19.79	79.25	21.02	1.19	4.08	0.01	0.12	38.62	133.82	2.10	0.09	666.80	34.34	13.71	430.15	5475.36	4108.51	3992.25	3948.63	5297.35	4776.42	293.37	211.45	549.80
19.79	79.19	21.01	1.01	3.44	0.01	0.10	37.88	166.79	2.79	0.14	789.45	34.25	13.71	426.37	5320.84	3995.87	3883.62	3841.01	5140.61	4646.71	293.26	201.57	666.47
19.79	79.13	20.99	0.85	2.87	0.02	0.08	36.79	207.16	3.80	0.22	939.15	34.08	13.71	422.43	5161.31	3879.43	3771.27	3729.72	4979.13	4512.55	293.13	189.91	803.68
19.79	79.13	20.99	0.85	2.88	0.02	0.08	36.81	206.44	3.79	0.22	936.43	34.08	13.71	410.65	4667.94	3517.38	3421.48	3383.33	4483.91	4094.70	293.21	171.81	726.12
19.79	79.12	20.99	0.73	2.50	0.01	0.07	36.97	245.23	3.70	0.14	1083.40	34.23	13.71	398.37	4164.18	3146.15	3062.42	3027.85	3981.71	3665.64	293.13	153.95	771.52
19.79	79.13	20.99	0.70	2.40	0.01	0.07	37.30	257.53	3.43	0.09	1130.75	34.35	13.71	395.06	4038.40	3053.49	2972.81	2939.12	3856.26	3558.56	292.86	150.62	786.38
19.79	79.13	20.99	0.67	2.29	0.00	0.07	37.46	273.22	3.31	0.04	1190.42	34.44	13.71	393.29	3972.36	3004.81	2925.72	2892.50	3790.44	3502.29	292.69	148.80	820.97

Appendix G Stack Loss Efficiency (page 20 of 20)

SUMS					AVERAGE	SUMS						
17287.10	58569.81	3646.20	44920.80	17994.28	5907.10	68001.94	9632.61	58369.3	173622.4	9632.6	749.2	37.0
Energy Losses (kJ/kg of Dry Fuel) Flue Gas Constituent					Total Loss Rate	Total Loss	Chemical Loss 1	Sensible and Latent Loss	Total Output	Chem Loss 2	Grams Produced	
CO	N_2	CH_4	H_2O Comb	H_2O Fuel MC							CO	HC
1869.20	3153.45	633.80	1632.66	675.94	8860.36	0.00	0	0.00	0	0	0.00	0.00
1061.08	1750.11	349.93	1624.85	660.10	5954.28	10130.43	2376	7754.88	23574	2376	176.44	10.65
50.36	710.49	-2.98	1644.83	652.95	3281.59	2579.61	37	2542.78	12993	37	3.88	-0.04
1638.05	3871.30	561.66	1713.15	705.75	9604.45	7252.83	1630	5622.74	7707	1630	119.73	7.55
378.98	751.95	113.18	1604.27	641.68	3717.81	1867.17	245	1621.77	8082	245	18.67	1.02
205.31	810.32	78.33	1675.01	668.45	3700.54	2653.07	201	2452.10	11550	201	14.36	1.00
800.27	2696.12	267.71	1763.83	712.61	7049.81	6414.08	952	5461.82	11610	952	70.37	4.33
1262.57	1346.65	482.51	1607.97	659.04	5753.44	3789.86	1138	2651.93	9259	1138	81.30	5.68
459.20	720.26	149.57	1596.41	640.06	3782.99	1831.06	293	1538.41	7757	293	21.82	1.30
260.33	538.35	94.69	1606.91	641.97	3312.05	1928.56	205	1723.30	9607	205	14.87	0.99
359.31	1890.46	107.04	1760.66	703.92	5408.38	3542.88	300	3243.09	9434	300	22.79	1.25
699.25	1442.11	211.67	1632.09	657.03	5066.98	2627.73	468	2160.06	7646	468	35.46	1.96
94.71	800.69	-37.18	1610.48	637.90	3346.97	1157.16	20	1137.47	5692	20	3.22	-0.23
80.63	1281.75	-42.20	1665.86	659.63	4033.53	1144.98	11	1134.28	4478	11	2.24	-0.21
83.55	2135.49	-74.82	1719.18	679.32	5181.21	1697.03	3	1694.44	4791	3	2.66	-0.44
126.82	2473.32	-69.93	1732.17	684.66	5682.65	2233.53	22	2211.83	5553	22	4.85	-0.49
173.54	2487.66	-61.17	1719.75	680.14	5735.20	2118.51	41	2077.90	5199	41	6.24	-0.40
389.46	2506.23	23.41	1700.26	676.11	6030.08	2062.85	139	1923.74	4714	139	12.98	0.14
345.49	2428.71	5.39	1697.99	674.42	5864.39	1696.71	100	1596.72	4035	100	9.74	0.03
386.12	2391.09	11.83	1685.06	669.57	5841.60	1424.37	96	1328.69	3406	96	9.18	0.05
603.63	2632.96	81.76	1673.92	668.16	6421.68	1519.07	160	1359.04	3167	160	13.93	0.35
800.77	3032.27	124.04	1664.87	666.38	7156.37	2044.46	261	1783.56	3615	261	22.33	0.63
1089.16	3502.75	197.24	1652.34	664.55	8099.62	1753.87	275	1478.66	2536	275	23.03	0.76
1084.67	3168.24	196.74	1638.15	658.82	7644.53	765.07	127	638.22	1218	127	10.61	0.35
1057.57	3280.37	129.10	1630.72	652.94	7676.16	1396.79	214	1183.02	2208	214	18.84	0.42
980.76	3323.41	76.52	1632.64	651.47	7601.80	1908.90	263	1646.04	3066	263	24.11	0.34
946.31	3443.31	38.33	1634.76	650.70	7683.17	461.36	59	402.83	728	59	5.56	0.04

COMPONENTS

ETL Mark Minimum Labeling Requirements (new Intertek Mark)

MINIMUM MARKING REQUIREMENTS FOR PRODUCTS BEARING THE ETL MARK

The ETL Listing Mark consists of the following four items:

1. The ETL Certification Mark with “US” and/or “C” as identifiers. The letter “C” adjacent and to the lower left side of the ETL Certification Mark indicates that the product complies with a Canadian standard. The letters “US” adjacent and to the lower right side of the ETL Certification Mark indicates that the product complies with a US standard. The required minimum size of the identifiers is 2 mm.
2. The word, "Listed" or "Classified" or "Recognized Component" (whichever is appropriate). The word, "Listed" is to be incorporated into the ETL Certification Mark. If upon reduction, the word “listed” is not legible as part of the trademark, it shall also appear separately.
3. The Control Number issued by Intertek Testing Services. This five to eleven digit number is unique to the manufacturing site for each applicant.
4. A standard description, which refers to the national standard used for certification shall be used. Example:

    - For US standards, the words, “Conforms to” shall appear with the standard number along with the word, “Standard” or “Std.” Example: “Conforms to ANSI/UL Std. XX.”
    - For Canadian standards, the words “Certified to CAN/CGA Standard CXX No. XX", shall be used, or abbreviated, "Cert. to CAN/CSA Std CXX No. XX".
    - If the manufacturer wishes, they may use the standard title, example “Telephone Equipment.”

Nothing selected
Nothing selected

Listing Report General Information

LISTING REPORT GENERAL INFORMATION

The Applicant have agreed to produce, test and label Intertek Listed products in accordance with the requirements of this Report. The Applicant has also agreed to notify Intertek and request authorization prior to using alternate parts, components or materials.

INSTRUCTIONS FOR USE

- One copy of this Report is submitted to the Applicant and used by the Intertek Field Representative for Follow-up Service Inspections; and
- One copy is retained in files at the Intertek Regional Certification Center.

The Applicant is to use this Report as a guide for the operation of the certification program, and will manufacture the Listed product(s) in accordance with the specifications information stated herein.

The Intertek Field Representative shall determine that the product is manufactured in accordance with this Report and that certification procedures are followed.

In the case where a discrepancy exists between the product and this Report, this Report will be considered correct, and therefore the Applicant has the responsibility for making the necessary corrections so that the product will meet the specifications stated herein.

COMPONENTS

Components used shall be those itemized in this Intertek Report covering the product, including any amendments and/or revisions.

CERTIFICATION MARK

The Intertek Certification Mark applied to the products shall either be separable in form, such as labels purchased from Intertek, or on a product nameplate or other media only as specifically authorized by Intertek. Use of the Intertek Certification Mark is subject to the control of Intertek.

MANUFACTURING AND PRODUCTION TESTS

Manufacturing and Production Tests shall be performed as required in this Report.

FOLLOW-UP SERVICE

Periodic unannounced Follow-up Service Inspections of the manufacturing facility shall be conducted by Intertek. A Follow-up Service Inspection Report shall be issued after each visit. Special attention will be given to the following:

1. Conformance of the manufactured product to the descriptions in this Report.
2. Conformance of the use of the Intertek Certification Mark with the requirements of this Report and the Intertek Certification Agreement.
3. In-plant quality control procedures and personnel.
4. Manufacturing processes and changes.
5. Performance of specified manufacturing and production tests.

In the event that the Intertek Field Representative identifies variance(s) to any provision of this Report, the Applicant shall take one or more of the following actions:

1. Correct the non-conformance.
2. Remove the Intertek Certification Mark from non-conforming product.
3. Contact the Intertek office that issued this Report for additional instructions.

GENERAL REQUIREMENTS AND DEFINITIONS

Accepted - Accepted by Intertek. All inquiries regarding change to Listed products must be presented to Intertek in writing for consideration and acceptance.

Authorized - Authorized by Intertek. All inquiries regarding change to Listed products must be

presented to Intertek in writing for consideration and approval.

C.S.A. - Canadian Standards Association.

Certified - Equipment or material included in a list published by a nationally recognized certification agency that conducts periodic inspections of production of Listed equipment or materials and whose listing stated either that the equipment or material meets recognized standards or has been tested and found suitable for use in a specified manner.

Construction Details - For specific construction details, reference should be made to the following photographs and descriptions. All dimensions are approximate unless specified as exact or within a tolerance. In addition to the specific construction details described in this Report, the following general requirements may also apply as applicable.

Discrepancy - A difference between this Report and a product described in this Report. This will result in the filing of a Variance Report on which a management level decision for the corrective action will be based.

Installation, Operating and Safety Instructions - Instructions for installation and use of this product are provided by the Manufacturer as required by the standard.

Listed - Equipment or materials included in a list published by a nationally recognized certification agency that conducts periodic inspections of production of listed equipment of materials, and whose listing states either that the equipment or materials meets nationally recognized standards, or has been tested and found suitable for use in a specified manner.

Listed Component - Identifies any product covered under the Listing or Certification service of an NRTL (US) or a CO (Canada).

Markings - The Intertek Certification Mark shall be visible after installation. Other markings may be required as identified in this Report. If evaluated to a Canadian standard, the products may be required to have markings in both French and English. If so, it is the responsibility of the Applicant to determine any such requirement and provide bilingual markings, where applicable, in accordance with the Provincial Regulatory Authorities.

N.F.P.A. - National Fire Protection Association.

Production Test Requirements - When applicable, the Manufacturer shall have the necessary test facilities to carry out production tests on the Listed product.

Products - The product as described under "Authorization to Mark" is eligible to carry the Intertek Certification Mark.

Recognized Component - Identifies any component, part or sub-assembly, covered under the recognition service of an NRTL (US) or a CO (Canada), and intended for use in Intertek Listed, Intertek Classified, or Intertek Recognized products.

Records - Records of the use of the Intertek Certification Mark must be maintained by the Applicant and must be available for review during normal business hours.

Shipping - As practically as possible, each Listed product is to be shipped completely assembled and incorporate the necessary safety and installation instructions.

Standards - The Manufacturer shall have in his possession all the current standards/specifications for the Listed product.

U.L. - Underwriters Laboratories Inc.

ULC - Underwriters' Laboratories of Canada.

Unlisted Component – Because unlisted components are uncontrolled, and they do not fall under a third party follow up program, ITS may require these components to be tested and/or evaluated at least once annually, more often for certain components, as part of the independent certification process.

Use of Mark - The Components containing the Intertek Certification Mark (i.e. ink stamps, labels) must be kept in a secure area, preferably locked and must not leave the designated manufacturing plant(s) location(s) unless authorized by Intertek. Records on the use of the mark are to be maintained up-to-date. The Intertek Certification Mark and associated product identification must be clearly visible and legible when applied to the finished product. Products to be marked must have successfully passed the production tests and scrutiny of the quality control personnel, determining that the product complies with the specifications stated in this Report. Failure to comply with procedures constitutes ground for withdrawal of Intertek authorization to use the Intertek Certification Mark.

Ordering Labels - It is the responsibility of the Applicant to ensure that an adequate stock of labels is maintained. Label quantities in stock are indicated on all packing slips issued by Intertek.

Modification Procedure - Intertek may approve modifications of a product based on an additional evaluation or tests. Fees are charged for this service. If modifications are desired, such as substituting a different material, changing the cosmetic appearance, changing the rating, altering a component to simplify the manufacturing or improve the product, or any other change, the following procedure must be followed:

1. Write the Intertek office that issued this Report requesting an evaluation of the modification required. Include a clear description and detailed drawings if required showing exactly what is involved, and state your reason for wanting to make the modifications.
2. Wait until written authorization is received from Intertek complete with additional or revised pages to be inserted into your Report. Only after written authorization is received may the Applicant proceed with the modification.

INITIAL FACTORY AUDIT

Purpose - The purpose of this audit is to ensure the following:

1. The Plant Manager, Foreman and Quality Control Personnel are familiar with this Report.
2. The Plant Quality Control Program will assure that the product is manufactured to the requirements in this Report.
3. Key personnel are familiar with and recognize the need for Follow-up Service Inspections as well as proper handling of the Intertek Certification Mark and the use of log sheets, where

applicable.
4. The duties of the Controller of the Intertek Certification Mark are properly understood.

Equipment or Supplies Needed

1. Applicable Specifications.
2. Applicable Standards.
3. Supply of log sheets where applicable.
4. Intertek Certification Mark Controller instruction sheet with sample log sheet.
5. Supply of open stock/custom labels or stamp, etc.

Initial Factory Audit Procedures - The initial inspection (pre-arranged with date and time agreeable to both the Applicant and the Intertek Field Representative) will consist of an initial meeting with the Plant Manager, Plant Foreman, Quality Control Manager and other key personnel. The initial meeting will cover a complete review of the Report and production facilities.

INTERTEK FOLLOW-UP SERVICE INSPECTIONS

The Intertek Field Representative shall determine that the product is manufactured in accordance with this Report, and that label procedures are followed.

Label Control - Record serial numbers of labels if applicable, in the plant. Inspect label log sheets. The following information should be recorded in the label log sheets by the manufacturer:

1. Label numbers, date labeled or shipped, product labeled, and destination.
2. Labels removed from, returned, freight damage, or rejected products should be picked up.

Examination of Product - At each Follow-up Service Inspection the Intertek Field Representative shall determine that the product which is intended to bear the Intertek Certification Mark is manufactured in accordance with the specified standards as per the test program and stated herein. The Intertek Field Representative shall pay special attention to the following:

1. Materials used must be free from defects that could affect the performance of the product.
2. Suitable protective packaging.
3. Complete safety and installation instructions are supplied with each product. No modification to these instructions shall be made without Intertek authorization.

Examination of Applicant's Inspection Programs - At each Follow-up Service Inspection, the Intertek Field Representative shall determine that the Applicant’s methods of inspection conform to the specifications included in the quality control procedures. The Intertek Field Representative will pay attention to:

1. The Applicant’s quality control report is complete and conforms to the procedure accepted by Intertek and included in this Report.
2. The equipment used for inspection conforms to the specification in the quality control procedure.The work area is suitable for a good quality control program.
3. Regular manufacturing production line tests are carried out by the Applicant.

Discrepancies - The Intertek Field Representative shall complete his Follow-up Service Inspection sheet detailing the discrepancy and issue a Variance Report. A signature on the Intertek Field Representative's copy shall be obtained from the Applicant's representative, giving evidence that they were issued a copy. Copies shall be forwarded to the Intertek Regional Certification Office.

The Intertek Field Representative shall require that the Applicant remove the Intertek Certification Mark from all products which do not meet the conformance requirements of this Report, and advise the Applicant not to use the Intertek Certification Mark until further advised.

In the case of minor cosmetic changes the Intertek Field Representative will note the variance on his Follow-up Services Inspection Report and determine the action to be taken by the Applicant. Actions may be to have the Applicant apply to Intertek for an evaluation of the variance and if approved, the subsequent modification of this Report, or to have the Applicant agree to correct the variance on all affected units.

On subsequent routine Follow-up Service Inspections, the Intertek Field Representative will pay special attention to any variances listed in previous Follow-up Inspection Reports. If it is found that a variance has not been corrected as agreed to by the Applicant, the Intertek Field Representative will contact Intertek Regional Certification Center for appropriate instructions. In extreme cases, service could be immediately suspended.

In the case of a difference existing between this Report and the product that could result in a safety hazard, the Intertek Field Representative will fill out a Variance Report. The determination of what constitutes a variance is left to the discretion of the Intertek Field Representative, but any modification or change that could affect the operating characteristics of a product must be reported. The action taken by Intertek will be:

1. Removal of all labels or the Intertek Certification Mark or halting the shipping of the affected product until the Applicant corrects the variance, or has an evaluation carried out by Intertek, the modification approved, and this Report updated.
2. For units already shipped, procedures must be taken per Intertek SOP 7.14.2.

ADDITIONAL REQUIREMENTS DRAWING INDEX

Intertek ETL Certification Marks

Intertek ETL Certification Marks

QUALITY CONTROL INFORMATION

See attached US EPA Supplemental audit form

DRAWING INDEX

US EPA Supplemental audit form

US EPA Supplemental audit form

US EPA Minimum Requirements for QA/QC Auditing

This format is used for inspections at manufacturing facilities on New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces.

Inspector instructions:

- Attach this inspection supplement to the standard Intertek WH Periodic Inspection Report.
- One audit form for each Model.
- Client can be asked to disassemble components in order to check dimensions.
- Minimum annual inspection of each model certified for EPA.

IMPORTANT: Any linear dimension cannot exceed ±1/4-inch (±0.64-cm) and any cross-sectional area for air introduction or catalyst bypass gaps cannot exceed 5%.

Applicant	Stove Builder International – St-Augustin-de-Desmaures
Manufacturer	Stove Builder International – La Guadeloupe
Model	Caddy
Report No.	1015495667MTL-001

Firebox dimensions:

Dwg #: PR04400-V01 p.2, 3, 4	Depth	Width	Height
Specified	22 5/8”	17”	15 ¼” to 14 3/8” (from brick to bottom of tube)
Actual			

Compliant	Non-compliant

Fuel Door Size:

Dwg PR04400-V01 p.13	Width	Height
Specified	16 15/32”	13 5/8”
Actual		

Compliant	Non-compliant

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US EPA Supplemental audit form (page 2 of 17)

Air introduction systems:

Dwg : PR04400-V01 p.5, 6, 7	Air inlet dimensions - Primary				Air inlet dimensions - Secondary
	Size 1	Size 2	Size 3 (pilot)	Size 4 (close)	Size 1
Specified	2 x 1” x 1 ¾”	1 x 1” x 2 ½”	¾” ID	¾” ID	2 x 1 ½” x 1 ½”
Actual					

Primary Air Inlet in Firebox : ¼” ID (front pilot)
(See drawing # PR04400-V01 p.7)

Secondary Air Inlets in Firebox : ¼” ID (rear pilot)
(See Drawing # PR04400-V01 p.9 for secondary air tube)

Method of control	

Compliant	Non-compliant

Baffles:

Dwg #: PR04400-V01 p.11	Length	Width
Specified	18 5/16”	15 ½”
Actual		

Location	Above secondary air tube

Compliant	Non-compliant

Refractory/Insulation:

Dwg # : PR04400-V01 p.10	Length	Width	Thickness
Specified	See drawing	See drawing	1 ¼”
Actual			

Location	Inside of the firebox.

Compliant	Non-compliant

Catalyst: N/A

Dwg #:	Length	Width	Thickness
Specified			

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US EPA Supplemental audit form (page 3 of 17)

Actual			

Location	

Compliant	Non-compliant

Catalyst Bypass: N/A

Gap tolerance when closed:	

Dwg #:	Length	Width	Area
Specified			
Actual			

Location	

Compliant	Non-compliant

Flue Gas Exit:

Dwg #: PR04400-V01 p.1, 2	Size
Specified	6” ID
Actual	

Location	Centered left-right, at the rear, horizontal. At 44” from the floor to the center of the flue tube.

Compliant	Non-compliant

Door and Catalyst Bypass Gaskets:

Dwg #: PR04400-V01 p.14	Fuel Door	
	Size	Length
Specified	¾” OD	55 ¼”
Actual		

Fitment	Fiberglass rope

Compliant	Non-compliant

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Outer Thermal Shielding and Thermal Coverings:

Dwg #: PR04400-V01 p.16	Side Shields	
	Length	Width
Specified	24”	28”
Actual		

Dwg #: PR04400-V01 p.16	Rear Shields	
	Height	Width
Specified	46 ¼”	24”
Actual		

Compliant	Non-compliant

Fuel Feed System (Pellet or Wood Chip Models): N/A

Dwg #:	Specified	Actual
Feed Rate		
Auger Motor Design		
Power Ratings		
Auger Angle		

Compliant	Non-compliant

Forced-Air Combustion System: Combustion Fan N/A

Dwg #:	Specified	Actual
Location		
Horsepower		
Fan Blade Size		

Compliant	Non-compliant

Factory Representative:
Signed: _____
Date: _____

Intertek Representative:
Signed: _____
Date: _____

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