Intertek Testing Services NA Ltd.
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ETL SEMKO

TEST REPORT

TEST OF A WOOD BURNING STOVE
FOR
EMISSIONS AND EFFICIENCY
PER
EPA METHODS 28 AND 5G-3, FEBRUARY 1988

MODEL: BIS ULTIMA

Client: Security Chimneys International Ltd.
2125 Monterey
Laval, Québec, Canada, H7L 3T6

Attention: Mr. Eric Dufour

TESTED BY:
Intertek Testing Services NA Ltd.
1829, 32nd Avenue
Lachine, Québec
H8T 3J1

TEST DATES: From November 12th to November 29th, 2001
REPORT DATE: December 7th, 2001
Project number: 3008830

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1.0 INTRODUCTION

1.1 GENERAL

From November 12th to November 29th, 2001, ITS, Lachine, Québec, conducted tests on the BIS VISTA non-catalytic fireplace from Security Chimneys International Ltd., to determine compliance with U.S. EPA emissions regulations.

Tests were conducted by Claude Paré. The tests were conducted at the ITS laboratory located at 1829, 32nd Avenue, Lachine, Québec. The laboratory elevation is 860 feet above sea level. Tests were conducted to EPA Method 28 and 5G-3 criteria, February 1988.

Unit sealing description.
When the certificate is issued, a steel strap was installed around the unit and fixed with clamp and screws and a ITS Logos was painted over the unit and the strap. The unit is shipped to the client .

1.2. TEST UNIT DESCRIPTION

The Bis Vista is a non-catalytic unit having air combustion intakes located at the bottom of the unit with its controls located on the left hand side of the unit. It was delivered for testing with a fan device.

1.3. RESULTS

The unit as tested produced a weighted average emission rate of 3.67 grams/hour and did not exceed any of the emission rate caps specified in the EPA regulations for the tests used for the calculations. The unit thus meets EPA certification requirements for 1990.

1.4. PRETEST INFORMATION

The test unit was made available at ITS in Lachine, Québec in November. The unit was inspected upon receipt and found to be in good condition. The unit was set up following the manufacturer's instructions.

Following assembly, the unit was placed on the test stand and the instrumented thermocouples were hooked up to our logging system. Prior to emission testing, a ten (10) hours break-in period was then performed during which the unit was set to operate at high to medium burn rate. During the break-in period, the unit was found to operate satisfactory.

Following inspection of the unit, the chimney system and laboratory dilution tunnel were cleaned using standard wire brush chimney cleaning equipment.

On November 12th, 2001, the unit was set-up for testing.

1.5. REPORT ORGANIZATION

This report includes summaries of all data necessary to determine compliance with the regulations.

2.0 SUMMARY OF TEST RESULTS

2.1 EMISSIONS

Run Number	Test Date	Burn Rate (kg/hr)	Adjusted Emission Rate (g/hr)	Heating Efficiency (% Overall)
1	2001-11-12	0.827	5.859	n/a
2	2001-11-13	0.571	38.935	n/a
3	2001-11-14	0.876	53.876	n/a
4	2001-11-20	0.971	3.932	n/a
5	2001-11-21	0.863	2.465	n/a
6	2001-11-22	1.020	2.134	n/a
7	2001-11-28	1.344	3.467	n/a
8	2001-11-29	2.285	4.934	n/a

2.2. WEIGHTED AVERAGE CALCULATION

Run Number	Burn Rate kg/hr	Adjusted Emission Rate g/hr	(OHE)	Output (BTU/hr)	Prob	(K) Weighing Factor
5	0.863	2.465	n/a	10406.23	.2660	.3498
4	0.971	3.932	n/a	11708.51	.3498	.3840
7	1.344	3.467	n/a	16206.22	.6499	.5937
8	2.285	4.934	n/a	27552.99	.9435	.3501
					Sum:	1.6775

Weighted Average Emissions Rate: 3.6706 g/hr

2.3 TEST FACILITY CONDITIONS

Run Number	Room Temperature		Barometric pressure		Relative humidity		Air Velocity	
	Before (F)	After (F)	Before (in.Hg)	After (in.Hg)	Before (%)	After (%)	Before (ft/min)	After (ft/min)
1	81	77	30.22	30.26	29	29	0	0
2	81	75	30.31	30.16	28	30	0	0
3	80	77	30.00	29.95	30	34	0	0
4	80	79	29.69	29.70	29	28	0	0
5	80	78	29.89	29.80	28	27	0	0
6	82	80	29.91	29.95	35	30	0	0
7	82	79	30.23	30.26	30	29	0	0
8	87	86	30.03	29.96	28	25	0	0

2.4 FUEL QUALITIES

Run Number	Pre-test Load			Test Load					
	Loading Weight Wet Basis (lbs)	Moisture Content Dry Basis (%)	Coal bed Weight (lbs)	Weight Wet Basis (lbs)	Density Wet Basis (lbs/ft^3)	Moisture Content Dry Basis (%)	Piece Length (in.)	Number of 2 X 4's	Number of 4 x 4's
1	11.60	20.5	2.15	10.50	36.12	19.2	14.6	3	1
2	11.60	20.5	2.35	9.60	36.23	20.5	13.1	3	1
3	11.60	19.1	2.50	10.00	35.93	19.5	13.5	3	1
4	11.50	20.0	2.30	9.95	34.70	21.2	14.1	3	1
5	11.45	20.2	2.45	9.95	37.66	20.7	13.2	3	1
6	11.15	20.9	2.15	9.95	36.88	20.7	13.6	3	1
7	11.00	21.5	2.05	10.10	36.07	20.4	14.0	3	1
8	11.60	20.5	2.15	10.15	36.12	19.2	14.6	3	1

2.5 DILUTION TUNNEL FLOW RATE MEASUREMENTS AND SAMPLING DATA (5G-3)

Average dilution tunnel measurements				Sample Data			
Run Number	Burn Rate (Min)	Volumetric Flow Rate (dscf/min)	Total Temperatures (°R)	Volume sampled (DSCF)		Particulate catch (mg)	
				1	2	1	2
1	290	149.19	561.10	41.62	42.43	19.0	19.4
2	380	151.70	549.59	51.09	48.33	222.5	215.0
3	260	149.21	551.93	36.86	37.71	238.6	255.0
4	230	141.76	565.83	43.91	33.03	12.3	10.4
5	260	148.36	561.67	37.18	38.72	5.8	6.5
6	220	150.04	572.48	31.61	32.29	4.2	4.4
7	170	147.20	581.67	19.73	20.74	4.3	5.7
8	100	150.47	625.27	9.52	10.01	3.4	3.8

2.6 DILUTION TUNNEL DUAL TRAIN PRECISION

Run Number	Sample Ratio		Total Emission (g)		
	Train 1	Train 2	Train 1	Train 2	% Deviation
1	1039.64	1019.73	19.75	19.78	0.03
2	1128.25	1192.68	251.04	256.43	0.44
3	1052.66	1028.81	251.16	262.35	0.90
4	742.54	987.24	9.13	10.27	2.43
5	1037.43	996.16	6.02	6.48	1.52
6	1044.19	1022.37	4.39	4.50	0.53
7	1268.08	1206.76	5.45	6.88	4.81
8	1580.70	1502.87	5.37	5.71	1.26

2.7 GENERAL SUMMARY OF RESULTS

Run Number	Burn Rate (kg/hr)	Average Surface Temperature (F)	Change in surface Temperature (F)	Initial Draft (in. H^2O)	Primary Air Setting	Run Time (min)
1	0.827	342.79	-124.20	0.053	Fully closed with residual (fixed) air intake at 0.500" dia.	290
2	0.571	255.71	-190.60	0.055	Fully closed with residual (fixed) air intake at 0.500" dia.	380
3	0.876	274.19	-76.00	0.045	Fully closed with residual (fixed) air intake at 0.500" dia.	260
4	0.971	344.53	-65.80	0.055	Fully closed with residual (fixed) air intake at 0.600". dia.	230
5	0.863	334.39	-86.80	0.050	Fully closed with residual (fixed) air intake at 0.600". dia.	260
6	1.020	384.75	-79.80	0.058	Opened with pin gauge 0.063"	220
7	1.344	395.23	-82.40	0.053	Opened with pin gauge 0.250"	170
8	2.285	481.73	-22.60	0.073	Fully opened	100

3.0 PROCESS DESCRIPTION

3.1 DISCUSSION

During the entire test program, the unit performed well and no hazardous behavior has been noticed.
Results from the tests no. 1, 2 and 3 are not considered in the final calculation as the minimum residual (fixed) air intake area has been smaller than test 4 and 5 for the low burn rate adjustment. Units will be produced with a 0.600" daimeter minimum residual air intake (refer to drawing no. 1958).

3.2 UNIT DIMENSIONS

Baffle

Location:	Below the flue exit
Restriction:	2½" x 3/8", respectively from top and front of combustion chamber
Dimensions:	18¾" to 21½" x 12½"
Material:	Ceramic Fiber M-Board (14-17 lbs/cu.ft.), 1" thick with one layer of Ceramic Fiber insulation (Albion 550K), ¼" thick.

Bricks

Ingredients:	Cement Secar51 from Lafarge (94 lbs)
	Crushed firebrick (160 lbs)
	Water (17 liters)
	Ribtex steel chips (7 lbs)
	Oil Eucon37 (200 ml)
	(Refer in Appendix E for detailed information)
Location:	Floor: all over (1" thick)
	Sides: all over (½" to 2¼" thick)
	Back: all over up to the baffle (1 1/8" thick)

Flue gas exhaust

Location:	Top of unit, centerline 9" from back and 15½" from sides
Dimensions:	6" diameter, 0.035" thick
Material:	Stainless Steel

Gasket

Location:		
	Door frame:	around the door.
	Glass:	between the glass and the main door frame to seal the glass
Dimensions:	5/8" diameter (door), 5/16" diameter(glass)	
Material:	Fiberglass cord from 3M (door frame:TXP020; glass:TXP050)	

Overall unit dimension

36" high, 28" to 36" wide, 24¼" deep.

Firebox

Dimensions:	11 ¾" deep x 18¾" to 21" wide x 10½" to 11¾" high
Usable volume:	1.51 cubic feet

Convection Fan

Manufacturer: SuperFan ZP (Refer in Appendix F for detailed information)

Model:	BSU1238-H
CFM:	100 CFM

3.3 AIR SUPPLY SYSTEM

The air supply system is made with three different air channels, one of them being a main adjustable air intake located in the upper portion of the fire chamber. One secondary air intake and one start-up air are also present on the unit to feed the combustion chamber. Start-up air is used only to help starting the unit for the first 5 minutes max, as mentionned in the operational manual.

The following table shows the inlet and outlet sections of each system. The air introduction system number is referred on a set of drawings in Appendix E.

AIR INTRODUCTION SYSTEM		INLET (I) sq. in.			OUTLET (sq. in.)
Identification	Type	I_{min}	I_{max}	Controlled	
A	Secondary	---	1.127	No	2.465
B	Start-Up Air	---	0.366	On-Off type	0.338
C	Main	0.283	2.564	Yes	2.731

Legend:

Identification: Tag name referred on drawings in Appendix E, section airflow pattern
Type: Characterisation of air intake
$I_{min.}$: Minimum air intake of a particular air channel
$I_{max.}$: Maximum air intake of a particular air channel
Controlled: Determines if a provision for air control is present
Outlet: Total air outlet of a particular air channel

3.4 OPERATION DURING TEST

Run #1:

This run lasted 290 minutes. It was performed on November 12th, 2001.
The burn rate achieved is a Category 2 with 0.827 kg/hr.

Refer to the front page of test run data #1 in Appendix A for the detailed test sequence.

Run #2:

This run lasted 380 minutes. It was performed on November 13th, 2001.
The burn rate achieved is a Category 1 with 0.571 kg/hr.

Refer to the front page of test run data #2 in Appendix A for the detailed test sequence.

Run #3:

This run lasted 260 minutes. It was performed on November 14th, 2001.
The burn rate achieved is a Category 2 with 0.876 kg/hr.

Refer to the front page of test run data #3 in Appendix A for the detailed test sequence.

Run #4:

This run lasted 230 minutes. It was performed on November 20th, 2001.
The burn rate achieved is a Category 2 with 0.971 kg/hr.

Refer to the front page of test run data #4 in Appendix A for the detailed test sequence.

Run #5:

This run lasted 260 minutes. It was performed on November 21st, 2001.
The burn rate achieved is a Category 2 with 0.863 kg/hr.

Refer to the front page of test run data #5 in Appendix A for the detailed test sequence.

Run #6:

This run lasted 220 minutes. It was performed on November 22nd, 2001.
The burn rate achieved is a Category 2 with 1.020 kg/hr.
It was performed for the confirmation fan test.

Refer to the front page of test run data #6 in Appendix A for the detailed test sequence.

Run #7:

This run lasted 170 minutes. It was performed on November 28th, 2001.
The burn rate achieved is a Category 3 with 1.344 kg/hr.

Refer to the front page of test run data #7 in Appendix A for the detailed test sequence.

Run #8:

This run lasted 100 minutes. It was performed on November 29th, 2001.
The burn rate achieved is a Category 4 with 2.285 kg/hr.

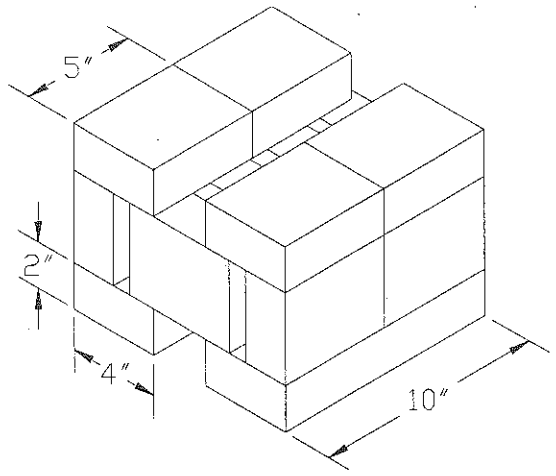
Refer to the front page of test run data #8 in Appendix A for the detailed test sequence.

3.5 START-UP OPERATION

Pre-test fuel charge

Cut a 2 x 4 lumber in **9** pieces of **5"** and **2** pieces of **10"**.
The weight of the pre-test has to be about ***11.50 lbs***. Add, substract or cut a piece of 2 x 4 lumber in order to reach the desired weight.
The pre-load of wood must be arranged according to the lay-out shown below:

Figure 1



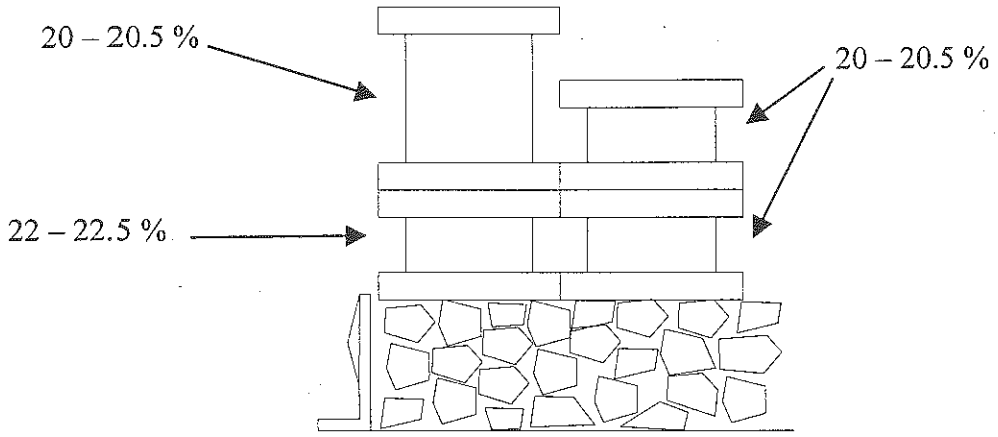
Test fuel charge

For categories 1, 2 and 3, the load of wood should weigh **between 10 and 11 lbs** including the weight of the spacers. Cut the pieces of wood so that the weight meets the requirements.

The test fuel charge consist of ***3 pieces of 1.5 x 1.5 and 1 piece of 1.5 x 3.5*** cut to a length of ***between 13 and 15.5 inches***. The logs have to respect the moisture content shown in figure 2 .

When loading the fireplace for testing, the wood must be arranged as shown below:

Figure 2



3.5.1 and 3.5.2Minimum burn rate testing procedure (Burn rate under 1.0 kg/hr)

3.5.1.1 and 3.5.2.1 Lighting procedure (kindling)

Crumple 8 sheets of newspaper (approx. 3" dia.) and place them in 2 rows covering the whole bottom surface of the firebox. Leave 1 inch of ash in the firebox.

Add ***3 lbs*** of small kindling wood

Open to the maximum both primary and start-up air control settings.

Light the newspaper and leave the door half opened. As you light the fire, start the timer.

At **1.0 lb**, open the door, and spread the embers evenly, using a poker. Then, add the pre-load of wood.

3.5.1.2 and 3.5.2.2 Pre-testing

Place the pre-test charge as shown in section 1 of this document and then close the door. Make sure that both primary and start-up air controls are opened.

At **8.5 lbs** close the primary air control completely but leave the start-up air control opened.

At **7 lbs** close the start-up air control.

Let the pre-load burn for 1 hour or until it reaches the Target weight (Between 25% and 20% of the test load).

Note : - If the fire goes out while pre testing, open the door to relight the load.

3.5.1.3 and 3.5.2.3 Testing

At Target :

Open the primary air control and start-up air control fully and then open the door.
Pack down the embers in order to get them parallel to the bottom of the firebox.
Place the load of wood in the firebox.
Begin testing : Start the chronometer and begin to collect the particles
Check the space between the embers and the load of wood. If the space is not large enough, move the embers using a poker.
Keep the door opened until the wood is ignited (about two and half minutes) and then close the door.
At the 5 minutes mark, close the primary air and start-up air controls

3.5.1 and 3.5.2Category 2 testing procedure (Burn rate between 0.80 and 1.25 kg/hr)

Perform another minimum burn rate test

3.5.3 Category 3 testing procedure (Burn rate between 1.25 and 1.90 kg/hr)

3.5.3.1 Lighting procedure (kindling)

Crumple 8 sheets of newspaper (approx. 3" dia.) and place them in 2 rows covering the whole bottom surface of the firebox. Leave 1 inch of ash in the firebox.

Add ***3 lbs*** of small kindling wood

Open to the maximum both primary and start-up air control settings.

Light the newspaper and leave the door half opened. As you light the fire, start the timer.

At **1.0 lb**, open the door, and spread the embers evenly, using a poker. Then, add the pre-load of wood.

3.5.3.2 Pre-testing

Place the pre-test charge as shown in section 1 of this document and then close the door. Make sure that both primary and start-up air controls are opened.

At **8.5 lbs** close the primary air control using a 0.25'' pin gauge and close the start-up air control completely.

Let the pre-load burn for 1 hour or until it reaches the Target weight (Between 25% and 20% of the test load).

Note : - If the fire goes out while pre testing, open the door to relight the load.

3.5.3.3 Testing

At Target :

Open the primary air control and start-up air control fully and then open the door.
Pack down the embers in order to get them parallel to the bottom of the firebox.
Place the load of wood in the firebox.
Begin testing : Start the chronometer and begin to collect the particles
Check the space between the embers and the load of wood. If the space is not large enough, move the embers using a poker.
Keep the door opened until the wood is ignited (about two minutes) and then close the door.
At the 4 minutes mark, close the primary air and start-up air controls

3.5.4 Category 4 testing procedure (Maximum burn rate)

3.5.4.1 Lighting procedure (kindling)

Crumple 8 sheets of newspaper (approx. 3" dia.) and place them in 2 rows covering the whole bottom surface of the firebox. Leave 1 inch of ash in the firebox.

Add *3 lbs* of small kindling wood

Open to the maximum both primary and start-up air control settings.

Light the newspaper and leave the door half opened. As you light the fire, start the timer.

At **1.0 lb**, open the door, and spread the embers evenly, using a poker. Then, add the pre-

load of wood.

3.5.4.2 Pre-testing

Place the pre-test charge as shown in section 1 of this document and then close the door. Make sure that both primary and start-up air controls are opened.

At **11.5 lbs** close the start-up air control completely.

At the 20 minutes mark, add three pieces of 2 x 4 x 5.

Let the pre-load burn for 1 hour or until it reaches the Target weight (Between 25% and 20% of the test load).

3.5.4.3 Testing

At Target :

Open the door.
Pack down the embers in order to get them parallel to the bottom of the firebox.
- Place the load of wood in the firebox and close the door.
Begin testing : Start the chronometer and begin to collect the particles

4.0 SAMPLING SYSTEMS

4.1 SAMPLING LOCATIONS

Particulate samples are collected from the dilution tunnel at a point 20 feet from the tunnel entrance. The tunnel has two elbows and two mixing baffles in the system ahead of the sampling section. The sampling section is a continuous 13 foot section of 6 inch diameter pipe straight over its entire length. Tunnel velocity pressure is determined by a standard pitot tube located 60 inches from the beginning of the sampling section. Thermocouple is installed on the pitot tube to measure the dry bulb temp. MC is assumed, as allowed, to be 4%. Tunnel samplers are located 60 inches downstream of the pitot tube and 36 inches upstream from the end of this section.

4.2 DRAWINGS

Various drawings of the stack gas sampling train and of dilution tunnel system are found in Appendix I.

4.3 EMISSIONS/EFFICIENCY TESTING EQUIPMENT LIST

ITEM DESCRIPTION	WH #	MANUFACTURER	MODEL	SERIAL #
1. CO, CO_2 & O_2 Analyzer	180-169	NOVA	7800CP3A	3819
2. Dry Gas Meter 1	180-175	American Meter Co. Ltd	DTM-200A	96X547016
3. Dry Gas Meter 2	180-176	American Meter Co. Ltd	DTM-200A	96X547017
4. Rotameter (1)	180-092	Omega	FL3839ST	064605
5. Rotameter (2)	180-131	Omega	FL3839ST	092489
6. Hot Wire Anemometer	180-222	Omega	HHf51	3436211
7. Inclined Manometer	180-139	Dwyer	125-AV	---
8. Pitot Tube	180-184	Dwyer	160S-18	---
9. Pitot Tube	180-290	Dwyer	160S-18	
10. Pressure gages (2)	180-291 / 180-292	Basco	0-15 PSI	---
11. Vacuum gages (2)	180-293 / 180-294	Basco	-30 - 0 in. Hg	---
12. Draft Indicator	180-156	Dwyer	2000-00	W42F
13. Scale, 1000lbs Cap./Record.	180-130	Papp	30" x 30"	---
14. Readout for 1000lbs Scale	180-129	Papp	UMC600AAAC	L6990
15. Scale, 8 kgs Capacity	180-083	Mettler	PC8000	826741
16. Analytical Balance	180-170	Ohaus	AP310S-0	1114501141
17. Diaphragm Pumps (2)	180-125	Barnant	400-1901	L94001630
	180-126	Barnant	400-1901	L94001743
18. Gases; Calibration, Zero, Span	---	Matheson	---	---
19. Moisture Meter	180-219	Delmhorst	J2000	14740
20. Humidity Chamber	180-160	Shop Built	---	---
21. Dilution Tunnel	180-142	Shop Built	---	---
22. Reference Dry Gas Meter	180-221	American Meter	DTM-200A	98Y990002
23. Spirometer	180-161	Shop built	---	---
24. Data Acquisition System	180-004	Fluke	2240-B	985022
25. Drying Oven	180-159	Quincy Lab. Inc.	21-350	9502106
26. Filter Holders, 47 mm (8)	180-157 & 180-158	Millipore	SX0004700	---
27. Type J T/C Plugs	---	Gordon	HMP	---
28. Sling Psychrometer	180-220	Omega	RHSP	A4Q
29. Dessicator cabinet	---	Nalgene	5317-0180	---
30. Exhaust blower	180-141	---	---	---
31. Drying columns	180-143	W.A. Hammond	---	---
	180-144	Drierite Co.	26800	---
32. Impinger train	180-140	Shop Built	---	---
33. Mercurial Barometer Nova	180-300	Princo	508-794mm	---

5.0 SAMPLING METHODS

5.1 PARTICULATE SAMPLING

Particulates were sampled in strict accordance with EPA Method 5G-3. 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.

6.0 QUALITY ASSURANCE

6.1 INSTRUMENT CALIBRATION

6.1.1 Dry Gas Meters

At the conclusion of each test program the dry gas meters are verified using the reference dry gas meter. This process involves sampling the train operation for 1 cubic foot of volume. With readings made to .001 ft^3, the resolution is .1%, giving an accuracy higher than the ∀2% required by the standard.

6.1.2 Stack Sample Rotameter

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 rotameter in series with one of the dry gas meters for 10 minutes with the rotameter at a constant setting. The dry gas meter volume measured is then corrected to standard temperature and pressure conditions.

6.1.3 Gas Analyzers

The continuous analyzers are zeroed and spanned before each test with NBS traceable gases. A mid-scale multi-component calibration gas is then analyzed (values are recorded). At the conclusion of a test, the instruments are checked again with zero, span and calibration gases (values are recorded only). 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 and 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.

6.2 TEST METHOD PROCEDURES

6.2.1 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. 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 the vacuum is typically less than 2 inches of mercury. Thus, leakage rates reported are expected to be much higher than actual leakage during the tests.

6.2.2 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.

6.2.3 Pm Sampling Proportionality (5g-3)

Proportionality was calculated in accordance with EPA Method 5G-3. The data and results are kept in file for future reference.

APPENDIX A
Data and Calculation Forms

							Type of	
							Stove:	2
					Weighted Average		1=cat	
							2=noncat	
							3=pellet	
		(E)						
		Ave.		Heat		(K)		
	Burn	Emission		Output		Weighting		
Test No.	Rate	Rate g/hr	(OHE)	(BTU/HR)	Prob.	Factor	(KxE)	KxOHE
1	0.863	2.465		10406.23	0.2660	0.3498	0.8624	0.00
2	0.971	3.932		11708.51	0.3498	0.3840	1.5097	0.00
3	1.344	3.467		16206.22	0.6499	0.5937	2.0582	0.00
4	2.285	4.934		27552.99	0.9435	0.3501	1.7273	0.00
				0.00	1.0000	0.0000	0.0000	0.00
				0.00	1.0000	0.0000	0.0000	0.00
				0.00	1.0000	0.0000	0.0000	0.00
				0.00	1.0000	0.0000	0.0000	0.00
				0.00	1.0000	0.0000	0.0000	0.00
				0.00	1.0000	0.0000	0.0000	0.00
4				0.00				
						1.67754	6.1576	0.00
ghted average emissions rate:							3.6706	
	Weighted Average OHE						0.00	

ITS Intertek Testing Services

Date: 2001-12-07

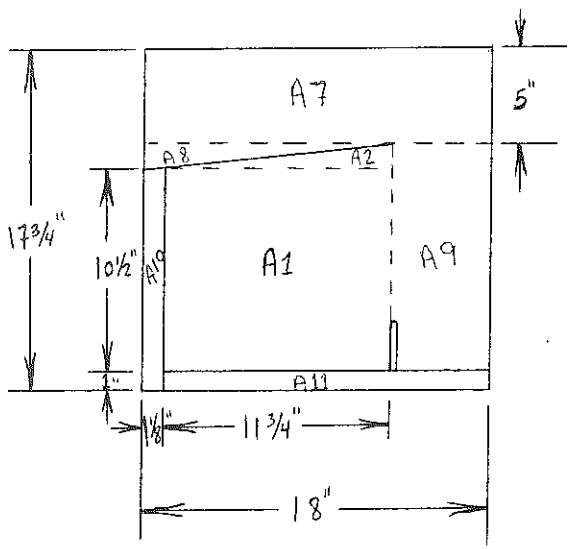
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Model: BIS VISTA

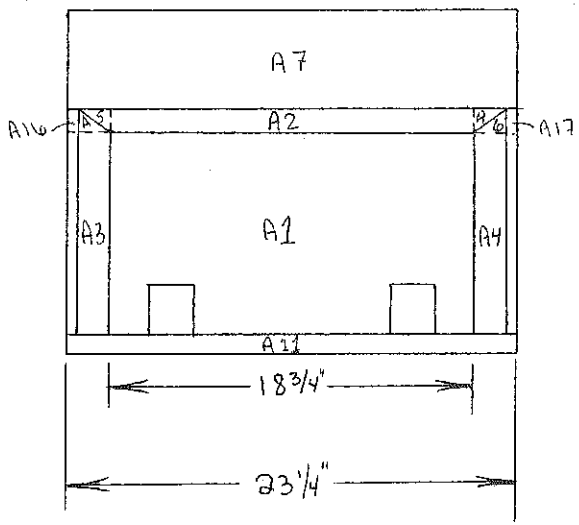
Project no.: 3008830

Tech.: CLAUDE PARÉ

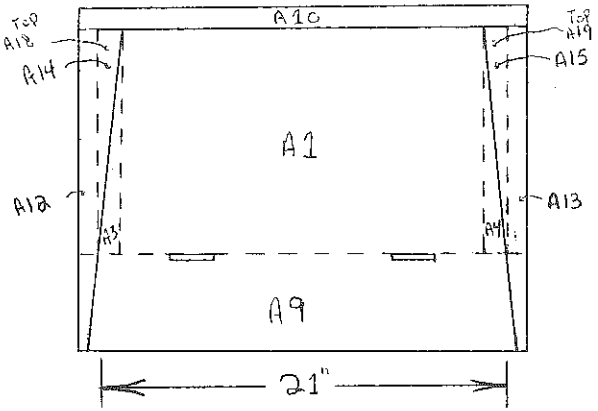
Side view



Front view



Top view



192-aq-9905

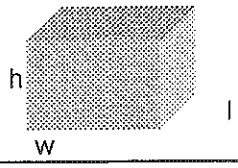
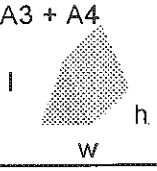
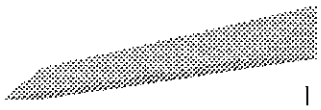
ITS Intertek Testing Services

Date: 2001-12-07 page 2

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

Project no.: 300830 Tech.: CLAUDE PARÉ

Addition ☒ Substraction ☐

Volume: A1 	l: 18.750 in. w: 11.750 in. h: 10.500 in.	l*w*h 2313.28 in.cu.
Volume: A3 + A4 	l: 1.125 in. w: 11.750 in. h: 10.500 in.	l*w*h/2 69.40 in.cu. 138.80 in.cu.
Volume: A2 	l: 18.750 in. w: 11.750 in. h: 1.250 in.	l*w*h/2 137.70 in.cu.
Volume: A5 + A6 	l: 1.125 in. w: 11.750 in. h: 1.250 in.	l*w*h/3 5.51 in.cu. 11.02 in.cu.
Volume Total:	A1+A2+A3+A4+A5+A6 V.T. in.cu. 2600.79	A1+A2+A3+A4+A5+A6 **V.T. cu.f.** **1.51**

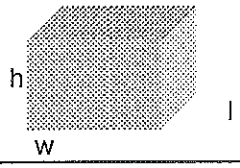
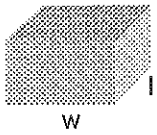
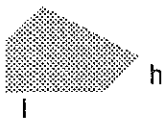
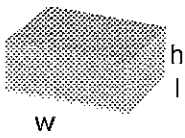
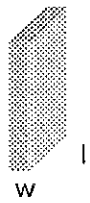
ITS Intertek Testing Services

Date: 2001-12-07 page 3

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

Project no.: 3008830 Tech.: CLAUDE PARÉ

Addition ☐ Substraction ☒

Volume: Atotal 	l: 23.250 in. w: 18.000 in. h: 17.750 in.	l*w*h 7428.375 in.cu. A.T. 7428.375
Volume A7 	l: 23.25 in. w: 18 in. h: 5 in.	l*w*h 2092.5 in.cu.
Volume: A8 	l: 23.25 in. w: 12.875 in. h: 1.25 in.	l*w*h/2 187.0898 in. cu.
Volume: A9 	l: 23.25 in. w: 5.125 in. h: 12.75 in.	l*w*h 1519.242 in. cu.
Volume: A10 	l: 23.25 w: 1.125 h: 11.5	l*w*h 300.7969 in. cu.

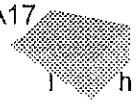
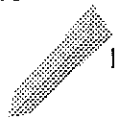
ITS Intertek Testing Services

Date: 2001-12-07 page 4

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

Project no.: 300830 Tech.: CLAUDE PARÉ

Addition ☐ Substraction ☒

Volume: A11 	l: 23.25 in. w: 11.75 in. h: 1 in.	l*w*h 273.19 in.cu.
Volume: A12 + A13 	l: 1.125 in. w: 11.75 in. h: 10.5 in.	l*w*h 138.80 in.cu. 277.59 in.cu.
Volume: A14 + A15 	l: 1.125 in. w: 11.75 in. h: 10.5 in.	l*w*h/2 69.40 in.cu. 138.80 in.cu.
Volume: A16 + A17 	l: 1.125 in. w: 11.75 in. h: 1.25 in.	l*w*h/2 8.26 in. cu. 16.52 in.cu.
Volume: A18 + A19 	l: 1.125 in. w: 11.75 in. h: 1.25 in.	l*w*h/3 5.51 in.cu. 11.02
Volume:	Atotal-(A7+A8+A9+A10+A11+ A12+A13+A14+A15+A16+A17+ A18+A19) V.T. in. cu. 2611.63	V.T cu. ft. **1.51**

ITS Intertek Testing Services

Date: 2001-12-07

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

Project no.: 3008830 Tech.: CLAUDE PARÉ

	ADDITION		SUBTRACTION	
	ft**3	Volume	ft**3	Volume
V measured	1.51	A1+A2+A3+A4+A5+A6	1.51	ATOTAL-(A7+A8+A9+A10 +A11+A12+A13+A14+A15 +A16+A17+A18+A19)
V ashlip	—		—	
%	—		—	
V usable	1.51		1.51	

Usable firebox volume: 1.51

Test load weight: 10.57 Minimum: 9.51 Maximum: 11.63

Deviation: 0,0 % (5% max.)

192-as-9905

INTERTEK TESTING SERVICES NA Ltd.

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:	Chem. Sec.	RESULTS	
Model:	Bis Vista		
Date:	2001-11-12	AVERAGE ADJUSTED EMISSION RATE:	5.859
Run:	1		
Project #:	3008830	Burn Rate (Dry kg/hr):	0.827
Test Duration: (minutes)	290		

PRESSURE FACTOR:		1.01070	BAROMETRIC PRESSURE		
				Average:	30.24
TEMPERATURE FACTORS				Start:	30.22
	DGM #1:	0.98842		End:	30.26
	DGM #2:	0.98997			
			DRY GAS METER VALUES		
VOLUMES SAMPLED			DGM #1	Final:	189.400
	DGM #1:	41.61672		Initial:	147.490
	DGM #2:	42.42946			
			DGM #2	Final:	222.539
TOTAL TUNNEL VOLUME (scf):		43266.491		Initial:	180.260
SAMPLE RATIOS			TEMPERATURES (DEG. RANKIN)		
	Sample Train 1:	1039.642		DGM #1:	534.183
	Sample Train 2:	1019.728		DGM #2:	533.350
TOTAL EMISSIONS			CALIBRATION FACTORS		
Sample Train 1 (g):		19.7532		DGM #1:	0.9940
Sample Train 2 (g):		19.7827		DGM #2:	1.0030
EMISSION RATES			TUNNEL FLOW RATE:		149.195
Sample Train 1 (g/hr):		4.0869			
Sample Train 2 (g/hr):		4.0930	PARTICULATE CATCH (mg)		
			Sample Train 1:		19.0000
ADJUSTED EMISSION RATES			Sample Train 2:		19.4000
Sample Train 1 (g/hr):		5.8550			
Sample Train 2 (g/hr):		5.8622			
	DEVIATION:	0.03%			

ITS Intertek Testing Services

Date: 2001-11-10

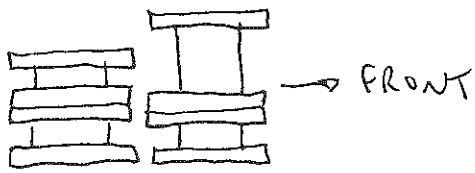
Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 1 Tech: CLAUDE PARÉ

COMMENTS

00:00 START FIRE WITH KINDLING, DOOR OPENED FOR 6 MINUTES
00:06 STIR THE FIRE, ADD PRETEST LOAD
00:24:30 CLOSE AIR INTAKE
00:33:30 CLOSE BOOST
01:34 POKE THE FIRE, ADD TEST LOAD
01:36:30 CLOSE THE DOOR
01:39 CLOSE AIR INTAKE AND CLOSE BOOST

TEST LOAD CONFIGURATION



192-k-9904

ITS Intertek Testing Services

Date: 2001-11-12

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 300830 Run: 1 Tech: CLAUDE PARÉ

Moisture Meter Calibration Check:

Pre/Post Checks		
Time: —	12: —	22: —

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	<50 fpm	<50 fpm
Smoke Capture Check	OK	OK
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	2001-11-09	
Date Dilution Tunnel Cleaned	2001-11-09	
Induced Draft Check	<0.005	OK
Tunnel Velocity	OK	
Flow Rate 140 cfm ±10%.		149.20
Pitot Leak Check:		
Side A	ok	ok
Side B	ok	ok
Temperature System:		
Ambient (65°- 90°F)	79.73 °F	
Wood Heater Surface (±125°F)	124.2 °F	
Proportional Checks:		
CO Analyzer Drift Check	ok	
CO_2 Analyzer Check	ok	
O_2 Analyzer Check	ok	
Thermocouple check	ok	

Sampling Train ID Numbers:	Train 1	Train 2
Probe	1	3
Filter Front	1	3
Filter Back	2	4
Filter Thermocouple	12	15
Filter 5G-3 (<90°F)	81	79

Termocouple Identification Number

Flue 1	Room 2	Dilution Tunnel Dry Bulb 3
Dilution Tunnel Wet Bulb 4	Unit Top 5	Unit Back 6
Unit Right Side 7	Unit Left Side 8	Unit Bottom 9
Catalyst/Combustion Chamber 10		

ITS Intertek Testing Services

Date: 2001-11-12

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 1 Tech: CLAUDE PARÉ

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers

	07 SYSTEM 1 16		29 SYSTEM 2 01	
Unplugged Flow Rate = .25cfm	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5	5	5	5
Final 1minute DGM (ft^3)	147.490	189.423	180.262	222.579
Initial 1minute DGM (ft^3)	147.489	189.422	180.257	222.573
Change (C) (ft^3)	0.001	0.001	0.005	0.006
Allowable leakage .04 x Sample rate or .02cfm	0.006	0.006	0.006	0.006
Check OK	ok	ok	ok	ok

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Vacuum (inches Hg.)	5	5
Rotometer Reading (mm)	15	15
Flow Rate (CFM)	0.002	0.002
Allowable (.04 x Sample Rate)	0.006	0.006
Check OK	ok	ok

ITS Intertek Testing Services

Date: 2001-11-12

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 1 Tech: CLAUDE PARÉ

Pre-Test Scale Audit

Scale Type	Audit Weight		Measured Weight	
Platform	6.60	lbs, Class F	6.60	lbs
Wood	2.20	lbs, Class F	2.20	lbs
Analytical	0.1000	mg, Class S	0.1000	mg

Post-Test Scale Audit

Scale Type	Audit Weight	Measured Weight
Platform	lbs, Class F	lbs
Wood	lbs, Class F	lbs
Analytical	mg, Class S	mg

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%

ITS Intertek Testing Services

Date: 2001-11-12

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 1 Tech: CLAUDE PARÉ

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.00	0.00	1.69	1.69	0.54	0.49
CO_2	0.01	0.00	16.9	16.9	4.51	5.02
O_2	0.0	0.0	21.5	21.5	6.5	6.50
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.02	1.73	0.55	0.02	0.04	0.01	ok	
CO_2	0.07	16.63	4.49	0.06	0.27	0.02	ok	
O_2	0.0	21.5	6.5	0.0	0.0	0.0	ok	

* Greater than ± 5% of the range used.

192-q-9904

ITS Intertek Testing Services

Date: 2001-11-18

Manufacturer: CHEMINÉES SÉCURITÉS Model: BIS VISTA

WHI LTO#: 3008830 Run: 1 Tech: CLAUDE PARÉ

FUEL DATA
PRE-TEST LOAD

FUEL DESCRIPTION:
Kindling weight: 3.10 lbs. Consisting of: DOUGLAS FIR Fire lit Time: 00:00

Pre-test load weight: 11.60 lbs. Consisting of: 2X4X 2:[illegible]10 6 inches Time loaded: 06:00

Pre-test moisture content: Corrected Dry: 20.5 % Wet: 17.0 %

Test Air Control Settings: COMPLETELY CLOSED Time: 00:24:30

Test Unit Fan Settings: FAN ON – MAXIMUM RATE Time: 00:00

TEST LOAD

	Lower Limit	Ideal	Upper Limit
Test Load Weight:	9.51 lbs.	10.57 lbs.	11.63 lbs.

Fire Box Volume:	1.51 ft.³	Ideal Length:	15 5/8 inches
Load Volume:	0.287 ft.³	Loading Density:	6.97 lbs/ft³
Number of Spacers	16 ¾x1½x5	Load Density:	36.12 lbs/ft³

Piece Size	Weight	Meter Moisture Content (% dry)*		
14 5/8 x 3½ x 1½ in.	1.66 lbs.	19.4 %	18.8 %	21.2 %
14 5/8 x 3½ x 1½ in.	1.62 lbs.	17.9 %	18.9 %	18.8 %
14 5/8 x 3½ x 1½ in.	1.61 lbs.	18.9 %	18.3 %	19.1 %
14 11/16 x 3½ x 3½ in.	3.67 lbs.	20.8 %	19.5 %	19.5 %
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%

*uncorrected range = 17.9% to 23.1%

TEST LOAD WEIGHT: 10.52 lbs **DRY WEIGHT:** 4.00 kg.

AVERAGE MOISTURE CONTENT:
CORRECTED TO TWO PIN: (DRY) 19.2 % (WET) 16.1 %

COAL BED RANGE:
2.10 lbs. to 2.63 lbs. (20% to 25% of test load)

TEST CHARGE:
Time loaded: 01:34 Coal bed weight: 2.15 lbs. Coal bed weight = 20.4 % of test load weight

CHARCOALIZATION: good|–|X|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|poor

ITS Intertek Testing Services

Date: 2001-11-12

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 1 Tech: CLAUDE PARÉ

DILUTION TUNNEL PARTICULATE SAMPLER DATA

FILTER TYPE: Gelman 47mm A/E

Samples in Desiccator Date: Time:

SYSTEM 1		SYSTEM 2	
Probe and Front Half Housing # 1	Filter Numbers 1 + 2	Probe and Front Half Housing # 3	Filter Numbers 3 + 4

Post Test Weight:	56.8115 grams	0.2403 grams	53.2663 grams	0.2439 grams
Pre Test Weight:	56.8086 grams	0.2242 grams	53.2634 grams	0.2274 grams
Gain:	0.0029 grams	0.0161 grams	0.0029 grams	0.0165 grams
	a1	b1	a2	b2

Total Gain: a1 + b1 = 0.0190 grams a2 + b2 = 0.0194 grams

Pre-test Weight Record		SYSTEM 1			SYSTEM 2				
		Probe & Housing Number	Front Filter Number	Back Filter Number	Probe & Housing Number	Front Filter Number	Back Filter Number	TEMP	HUMID
Date	Time	1	1	2	3	3	4	°F	%
01-11-12	6h30	56.8087	0.1141	0.1102	53.2634	0.1104	0.1170		
01-11-12	8h30	56.8086	0.1140	0.1102	53.2634	0.1104	0.1170		
		Total			Total				

Post-test Weight Record		SYSTEM 1			SYSTEM 2			TEMP	HUMID
		Probe & Housing Number	Combined Filter Weight Number		Probe & Housing Number	Combined Filter Weight Number			
Date	Time	1	1	2	3	3	4	°F	%
01-11-13	7h00	56.8115	0.1298	0.1107	53.2663	0.1266	0.1174		
01-11-13	14h16	56.8115	0.1297	0.1106	53.2663	0.1265	0.1174		

ITS Intertek Testing Services

Date: 2001-11-19

Manufacturer: CHEMINÉES SÉCURITÉ

Model: BIS VISTA

WHI LTO#: 3008830

Run: 1

Tech: CLAUDE PARÉ

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 30.22 (inches Hg.) Static pressure (P_q) 0,135 (inches w.c.)
Inside diameter: Port A 6in. Port B 6in. Tunnel cross sectional area: 0.1963Ft²
Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)	$\sqrt{\Delta p}$
A-Centroid	3.00	.0625	111	0.2500
B-Centroid	3.00	.065	114	0.2550
A-1	0.40	.06	112	0.2449
A-2	1.50	.065	113	0.2550
A-3	4.50	.06	113	0.2449
A-4	5.60	.05	99	0.2236
B-1	0.40	.065	114	0.2550
B-2	1.50	.0675	114	0.2598
B-3	4.50	.06	111	0.2449
B-4	5.60	.05	99	0.2236
		AVERAGE	109	0.2440

Adjustment factor application

$$V_s = K_P C_P F_P (\sqrt{\Delta_P})AVG \sqrt{\frac{T_S}{P_s M_s}}$$

$$V_s = K_p C_p (\sqrt{\Delta_p})avg. \sqrt{\frac{T_s}{P_s M_s}}$$

0.9663

Where,
C_p = pito tube coefficient = 0.84 for type S pitot
Δ_p = manometer reading (inches H_2O)
T_s = average absolute dilution tunnel temperature (°F + 460)
P_s = absolute dilution tunnel gas pressure or $P_{bar} + P_g$
P_g = static pressure $\frac{inches\ H_2O}{13.6}$

$$F_P = \frac{(\sqrt{\Delta_P})avg}{(\sqrt{\Delta_P})centroid}$$

Adjustment factor for alternative pitot tube placement:

M_s = 28.56, wet molecular weight of stack gas (alternatively, it may be measured)
K_p = 85.49 pitot tube constant, (conversion factor for english units)
$(\sqrt{\Delta_p})avg.$ = average of the square roots of the velocity heads (Δ_p) measured at each traverse point.

$(\sqrt{\Delta_P})centroid$ = average of the square roots of the velocity heads measured at the tunnel centroid (inches of H_2O)

ITS Intertek Testing Services

Date: 2001-11-12

Manufacturer: CHEMINÉES SÉCURITÉ

Model: BIS VISTA

WHI LTO#: 3008830

Run: 1

Tech: CLAUDE PARÉ

TEST DATA LOG

RAW DRY GAS METER READINGS

	System 1	System 2
Final (ft^3)	189.400	222.539
Initial (ft^3)	147.490	180.260

AMBIENT CONDITIONS

	Start	End
Barometer. (inches Hg)	30.22	30.26
Wet Bulb (°F)	58	57
Dry Bulb (°F)	77	76
Humidity (%)	29	29

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-12 Run #: 1 Sheet # 10 of 12

Time loaded: 01:34

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. ~~Side~~	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
					659	76	153	805	299	214	239	120								73	72	72	72	72	73			
					521	78	122	692	367	279	290	141								73	72	73	72	72	74			
					465	78	113	607	393	316	319	164								73	72	73	72	72	74			
					445	79	111	607	398	335	329	179								73	72	74	72	72	74			
					457	80	118	651	403	351	343	188								73	72	74	72	72	75			
					456	81	114	663	417	368	359	196								73	72	75	72	72	75			
					432	82	112	620	434	387	379	203								74	72	75	72	72	76			

Technician: CLAUDE PARÉ ☒ *Pre Test* ☐ *Test*

192-v-9904

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-18 Run #: 1 Sheet # 12 of 12

Time loaded: 01:34

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
240	0.50	1.05	1.64	18.1	207	78	88	289	299	306	294	215	—	—	2.0	182.147	60	215.130	55	75	74	72	74	73	72	0.060	0.035	ok
250	0.40	1.02	1.60	18.2	204	78	87	285	297	302	292	214	—	—	2.0	183.598	60	216.683	55	75	74	72	74	73	72	0.060	0.0325	ok
260	0.30	1.16	1.60	18.1	207	77	87	284	294	300	291	213	—	—	2.0	185.047	60	218.094	55	75	74	72	74	73	72	0.060	0.0325	ok
270	0.15	1.09	1.64	18.1	200	77	86	284	292	298	289	212	—	—	2.0	186.497	60	219.570	55	75	74	72	74	73	72	0.060	0.0325	ok
280	0.05	1.06	1.60	18.2	198	77	86	283	291	297	288	212	—	—	2.0	187.948	60	221.053	55	75	74	72	74	73	72	0.060	0.0325	ok
290	0.00	1.00	1.52	18.3	195	77	86	282	290	295	286	211	—	—	2.0	189.400	60	222.539	55	75	74	72	74	73	72	0.060	0.0325	ok

Technician: CLAUDE LARÉ ☐ *Pre Test* ☒ *Test*

192-v-9904

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-12 Run #: 1 Sheet # 11 of 12

Time loaded: 01:34

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	10.50	0.27	6.94	14.0	400	81	170	345	436	393	394	213			2.0	147.490	60	180.260	55	74	73	77	73	72	77	0.0575	0.050	ok
10	8.70	0.81	5.86	14.1	457	80	123	607	427	404	389	220			2.0	148.927	60	181.604	55	74	73	81	73	72	79	0.0625	0.065	ok
20	7.65	0.66	5.47	13.5	440	80	115	588	402	393	381	224			2.0	150.351	60	183.137	55	74	73	79	73	73	77	0.065	0.065	ok
30	6.45	0.81	7.12	12.3	452	81	116	661	400	392	380	224			2.0	151.782	60	184.606	55	74	73	78	73	73	76	0.0625	0.065	ok
40	5.70	1.02	7.24	12.9	456	84	118	698	417	400	384	221			2.0	153.212	60	186.079	55	74	73	78	73	73	76	0.0625	0.0675	ok
50	3.95	1.05	6.68	14.1	452	85	118	716	441	414	399	219			2.0	154.596	60	187.356	55	74	73	77	73	73	76	0.065	0.0675	ok
60	3.30	0.21	5.84	14.5	427	84	114	637	451	427	410	222			2.0	156.043	60	188.833	55	75	73	76	73	73	73	0.0625	0.0625	ok
70	2.95	0.35	5.13	14.8	393	83	111	562	440	429	418	221			2.0	157.498	60	190.252	55	75	73	76	74	73	76	0.0625	0.0575	ok
80	2.60	0.40	4.76	15.2	369	83	108	525	423	427	414	223			2.0	158.939	60	191.689	55	75	73	76	74	73	76	0.060	0.055	ok
90	2.35	0.54	4.55	15.5	352	82	106	497	409	420	408	220			2.0	160.390	60	193.111	55	75	73	77	74	73	77	0.060	0.055	ok
100	2.05	0.49	4.15	15.5	341	82	104	484	397	416	403	227			2.0	161.841	60	194.589	55	75	73	77	74	73	77	0.0625	0.0525	ok
110	1.80	0.64	4.11	16.5	323	81	102	464	389	412	402	228			2.0	163.293	60	195.932	55	75	73	77	74	73	76	0.065	0.050	ok
120	1.65	1.30	2.89	17.4	297	80	100	400	377	401	392	229			2.0	164.745	60	197.385	55	75	73	76	74	73	76	0.0625	0.0475	ok
130	1.60	1.29	2.61	17.6	278	80	97	369	362	389	377	225			2.0	166.203	60	198.884	55	75	74	76	74	73	75	0.065	0.045	ok
140	1.50	1.25	1.85	17.6	263	79	95	350	351	377	365	224			2.0	167.657	60	200.383	55	75	74	75	74	73	75	0.0625	0.0425	ok
150	1.45	1.29	1.80	17.7	251	79	94	337	341	365	353	226			2.0	169.116	60	201.867	55	75	74	75	74	73	74	0.0625	0.040	ok
160	1.30	1.27	1.78	17.7	248	78	93	330	334	355	342	224			2.0	170.575	60	203.332	55	75	74	74	74	73	74	0.0625	0.040	ok
170	1.20	1.29	1.75	17.7	234	78	92	319	326	346	330	221			2.0	172.098	60	204.734	55	75	74	74	74	73	73	0.060	0.0375	ok
180	1.10	1.27	1.74	17.7	228	78	91	315	321	339	326	222			2.0	173.478	60	206.271	55	75	74	74	74	73	73	0.0625	0.0375	ok
190	1.00	1.23	1.76	17.8	224	78	90	308	317	332	318	218			2.0	174.913	60	207.748	55	75	74	73	74	73	73	0.060	0.0375	ok
200	0.95	1.22	1.74	17.8	219	78	90	304	312	327	312	222			2.0	176.359	60	209.220	55	75	74	73	74	73	73	0.060	0.035	ok
210	0.85	1.16	1.73	17.9	216	78	89	298	309	321	308	219			2.0	177.805	60	210.694	55	75	74	73	74	73	72	0.060	0.035	ok
220	0.70	1.14	1.70	17.9	213	78	89	296	306	316	302	218			2.0	179.250	60	212.177	55	75	74	73	74	73	72	0.0625	0.035	ok
230	0.60	1.11	1.66	18.0	210	78	88	293	303	311	297	216			2.0	180.699	60	213.656	55	75	74	73	74	73	72	0.060	0.035	ok

Technician: [illegible] ☐ Pre Test ☒ Test

192-v-9904

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-13 Run #: 2 Sheet # 12 of 12

Time loaded: 01:39

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam.	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp [illegible]	Filter temp			
240	1.05	1.60	1.89	17.1	195	77	85	248	267	279	224	228			2.0	221.957	58	253.115	53	75	74	73	74	73	73	0.060	0.0325	ok
250	0.95	1.61	1.89	17.2	192	77	85	243	260	274	220	227			2.0	223.314	58	254.375	53	75	74	72	74	73	72	0.060	0.0325	ok
260	0.85	1.00	1.87	17.3	191	76	85	240	253	271	216	226			2.0	224.666	58	255.639	53	75	74	72	74	73	72	0.060	0.030	ok
270	0.70	0.99	2.07	17.3	189	76	85	239	251	267	217	226			2.0	226.020	58	256.897	53	75	74	72	74	73	72	0.060	0.030	ok
280	0.60	0.99	2.08	17.3	187	76	84	239	247	263	217	223			2.0	227.375	58	258.167	53	75	74	72	74	73	72	0.060	0.030	ok
290	0.50	0.97	1.99	17.5	186	76	84	235	246	261	215	221			2.0	228.730	58	259.427	53	75	74	72	74	73	72	0.060	0.030	ok
300	0.40	0.89	1.94	17.6	184	76	84	231	240	257	214	218			2.0	230.093	58	260.688	53	75	74	72	74	73	72	0.060	0.030	ok
310	0.30	0.88	1.82	17.8	181	76	84	229	239	252	210	217			2.0	231.450	58	261.959	53	75	74	72	74	74	72	0.060	0.030	ok
320	0.25	0.84	1.62	18.0	178	76	83	224	234	248	208	214			2.0	232.805	58	263.221	53	75	74	72	74	73	72	0.060	0.030	ok
330	0.20	0.88	1.51	18.1	175	76	83	218	227	242	205	210			2.0	234.165	58	264.487	53	75	74	72	74	73	72	0.060	0.030	ok
340	0.15	0.87	1.36	18.3	171	75	82	215	222	237	199	207			2.0	235.527	58	265.756	53	75	74	72	74	73	72	0.060	0.0275	ok
350	0.10	0.82	1.15	18.6	166	75	82	209	217	231	194	203			2.0	236.887	58	267.019	53	75	74	72	74	73	72	0.060	0.0275	ok
360	0.05	0.73	0.95	18.9	161	75	82	197	210	224	188	200			2.0	238.247	58	268.293	53	75	74	72	74	73	72	0.060	0.025	ok
370	0.05	0.65	0.86	19.0	156	75	81	188	202	216	183	196			2.0	239.574	58	269.526	53	75	74	72	74	73	72	0.060	0.025	ok
380	0.00	0.64	0.79	19.4	152	75	81	185	196	207	173	192			2.0	240.933	58	270.787	53	75	74	72	74	73	72	0.060	0.025	ok

Technician: CLAUDE PARÉ

☐ *Pre Test* ☒ *Test*

192-v-9904

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-13 Run #: 2 Sheet # 11 of 12

Time loaded: 01:39

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	9.60	0.14	3.63	16.9	393	81	168	530	402	395	376	203			2.0	189.455	58	220.608	53	74	73	76	73	73	77	0.060	0.055	ok
10	8.15	0.55	3.40	17.1	417	80	116	563	400	397	378	208			2.0	190.773	58	223.833	53	74	73	82	73	73	82	0.0625	0.0625	ok
20	7.70	0.67	2.05	18.8	337	78	105	403	370	379	355	209			2.0	192.159	58	225.125	53	74	73	79	73	73	79	0.065	0.0525	ok
30	7.45	0.59	1.07	19.3	288	78	99	338	328	353	331	205			2.0	193.547	58	226.418	53	75	73	77	73	73	77	0.065	0.045	ok
40	7.75	0.59	0.83	19.4	255	78	95	299	299	328	311	201			2.0	194.924	58	227.706	53	75	74	76	73	73	76	0.065	0.040	ok
50	7.10	0.64	0.82	19.3	232	77	91	278	277	307	293	196			2.0	196.308	58	228.995	53	75	73	75	74	73	75	0.065	0.0375	ok
60	6.85	0.85	0.90	19.0	216	77	90	260	259	290	277	191			2.0	197.685	58	230.288	53	75	73	74	74	73	74	0.060	0.035	ok
70	6.45	1.27	1.21	18.5	209	77	88	259	248	278	266	187			2.0	199.053	58	231.562	53	75	73	74	74	73	74	0.060	0.0325	ok
80	5.75	1.73	1.77	17.9	210	76	88	268	246	270	256	183			2.0	200.407	58	232.833	53	75	73	73	74	73	73	0.060	0.0325	ok
90	4.90	2.22	2.40	17.1	217	76	88	285	251	268	253	182			2.0	201.729	58	234.076	53	75	74	73	74	73	73	0.060	0.035	ok
100	4.20	2.35	2.74	16.5	218	76	87	295	261	270	253	180			2.0	203.048	58	235.381	53	75	74	73	74	73	73	0.060	0.035	ok
110	3.80	2.41	2.64	16.2	219	77	87	300	276	274	257	180			2.0	204.362	58	236.705	53	75	74	72	74	73	73	0.060	0.035	ok
120	3.45	2.07	2.64	16.5	219	77	87	305	291	281	259	179			2.0	205.708	58	237.990	53	75	74	72	74	73	73	0.060	0.035	ok
130	3.15	2.06	2.44	16.4	220	77	87	305	297	291	267	180			2.0	207.069	58	239.354	53	75	74	72	74	73	73	0.060	0.035	ok
140	2.95	2.06	2.43	16.3	219	77	88	286	295	291	235	206			2.0	208.430	58	240.523	53	75	74	73	74	73	73	0.060	0.035	ok
150	2.75	2.12	2.53	16.2	217	77	87	281	289	292	231	214			2.0	209.787	58	241.782	53	75	74	73	74	73	73	0.060	0.035	ok
160	2.55	2.01	2.53	16.4	215	77	87	272	283	293	232	217			2.0	211.139	58	243.047	53	75	74	73	74	73	73	0.060	0.035	ok
170	2.30	1.94	2.44	16.4	213	76	87	273	282	293	231	222			2.0	212.496	58	244.310	53	75	74	73	74	73	73	0.060	0.035	ok
180	2.05	1.95	2.47	16.4	211	77	87	267	277	294	233	223			2.0	213.853	58	245.566	53	75	74	73	74	73	73	0.060	0.035	ok
190	1.85	1.90	2.48	16.5	210	77	87	269	280	293	232	226			2.0	215.208	58	246828	53	75	74	73	74	73	73	0.060	0.035	ok
200	1.60	1.83	2.39	16.7	207	77	87	266	274	292	232	227			2.0	216.557	58	248.085	53	75	74	73	74	73	73	0.060	0.0325	ok
210	1.45	1.69	2.22	16.9	204	77	86	260	275	290	228	228			2.0	217.906	58	249.339	53	75	74	73	74	73	73	0.060	0.0325	ok
220	1.30	1.64	2.04	17.0	201	77	86	259	271	288	227	228			2.0	219.253	58	250.598	53	75	74	73	74	74	73	0.060	0.035	ok
230	1.20	1.58	1.94	17.1	197	77	86	249	268	284	225	229			2.0	220.604	58	251.858	53	75	74	73	74	73	73	0.060	0.0325	ok

Technician: CLAUDE PARÉ

☐ *Pre Test* ☒ *Test*

192-v-9904

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-13 Run #: 2 Sheet # 10 of 12

Time loaded: 01:39

Elapsed time	~~Weight~~ remaining	CO	CO_2	O_2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
					502	75	137	587	243	193	215	111								73	72	72	72	72	73			
					606	78	153	801	301	235	254	134								73	72	73	72	72	74			
					507	81	125	721	344	292	303	155								73	72	74	72	72	74			
					470	81	116	665	352	324	330	169								73	72	75	72	72	75			
					452	81	114	646	362	343	340	176								74	72	75	72	72	75			
					440	82	113	649	372	357	354	182								74	73	75	73	72	76			
					403	83	109	622	401	388	375	197								74	73	76	73	73	77			

Technician: CLAUDE PARÉ

☒ *Pre Test* ☐ *Test*

192-v-9904

INTERTEK TESTING SERVICES NA Ltd.

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-13
Run:	2
Project #:	3008830
Test Duration: (minutes)	380

RESULTS

AVERAGE ADJUSTED EMISSION RATE:	38.935
Burn Rate (Dry kg/hr):	0.571

PRESSURE FACTOR:		1.01053
TEMPERATURE FACTORS		
	DGM #1:	0.98810
	DGM #2:	0.98976
VOLUMES SAMPLED		
	DGM #1:	51.09251
	DGM #2:	48.33235
TOTAL TUNNEL VOLUME (scf):		57645.234
SAMPLE RATIOS		
	Sample Train 1:	1128.252
	Sample Train 2:	1192.684
TOTAL EMISSIONS		
Sample Train 1 (g):		251.0361
Sample Train 2 (g):		256.4271
EMISSION RATES		
Sample Train 1 (g/hr):		39.6373
Sample Train 2 (g/hr):		40.4885
ADJUSTED EMISSION RATES		
Sample Train 1 (g/hr):		38.5920
Sample Train 2 (g/hr):		39.2787
	DEVIATION:	0.44%

BAROMETRIC PRESSURE

Average:	30.235
Start:	30.31
End:	30.16

DRY GAS METER VALUES

DGM #1	Final:	240.933
	Initial:	189.455
DGM #2	Final:	270.787
	Initial:	222.608

TEMPERATURES (DEG. RANKIN)

DGM #1:	534.359
DGM #2:	533.462

CALIBRATION FACTORS

DGM #1:	0.9940
DGM #2:	1.0030

TUNNEL FLOW RATE:	151.698
PARTICULATE CATCH (mg)	
Sample Train 1:	222.5000
Sample Train 2:	215.0000

ITS Intertek Testing Services

Date: 2001-11-13

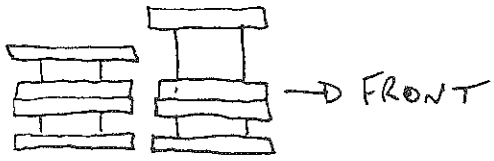
Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 2 Tech: CLAUDE PARÉ

COMMENTS

00:00 START FIRE WITH KINDLING
00:06:30 STIR THE FIRE, ADD PRETEST LOAD, CLOSE THE DOOR
00:30 CLOSE AIR INTAKE
00:39 CLOSE BOOST
01:39 POKE FIRE, ADD TEST LOAD
01:41:30 CLOSE THE DOOR
01:44 CLOSE AIR INTAKE, CLOSE BOOST

TEST LOAD CONFIGURATION



ITS Intertek Testing Services

Date: 2001-11-13

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 2 Tech: CLAUDE PARÉ

Moisture Meter Calibration Check:

Pre/Post Checks		
Time: —	12: —	22: —

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	< 50 fpm	< 50 fpm
Smoke Capture Check	Ok	Ok
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	2001-11-09	
Date Dilution Tunnel Cleaned	2001-11-09	
Induced Draft Check	< 0.005	Ok
Tunnel Velocity	Ok	
Flow Rate 140 cfm ±10%.		149.20
Pitot Leak Check:		
Side A	Ok	Ok
Side B	Ok	Ok
Temperature System:		
Ambient (65°- 90°F)		79.73 °F
Wood Heater Surface (±125°F)		-124.2 °F
Proportional Checks:		
CO Analyzer Drift Check		Ok
CO_2 Analyzer Check		Ok
O_2 Analyzer Check		Ok
Thermocouple check		Ok

Sampling Train ID Numbers:	Train 1	Train 2
Probe	4	7
Filter Front	5	7
Filter Back	6	8
Filter Thermocouple	12	15
Filter 5G-3 (<90°F)	82	82

Termocouple Identification Number

Flue 1	Room 2	Dilution Tunnel Dry Bulb 3
Dilution Tunnel Wet Bulb 4	Unit Top 5	Unit Back 6
Unit Right Side 7	Unit Left Side 8	Unit Bottom 9
Catalyst/Combustion Chamber 10		

ITS Intertek Testing Services

Date: 2001-11-13

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 2 Tech: CLAUDE PARÉ

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers

	08 SYSTEM 1 24		23 SYSTEM 2 31	
Unplugged Flow Rate = .25cfm	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5	5	5	5
Final 1minute DGM (ft^3)	189.455	240.963	222.611	270.818
Initial 1minute DGM (ft^3)	189.451	240.959	222.608	270.813
Change (C) (ft^3)	0.004	0.004	0.003	0.005
Allowable leakage .04 x Sample rate or .02cfm	0.005	0.005	0.005	0.005
Check OK	ok	OK	ok	ok

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Vacuum (inches Hg.)	5	5
Rotometer Reading (mm)	22	22
Flow Rate (CFM)	0.003	0.003
Allowable (.04 x Sample Rate)	0.006	0.006
Check OK	ok	ok

192-n-9904

ITS Intertek Testing Services

Date: 2001-11-13

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 2 Tech: CLAUDE PARÉ

Pre-Test Scale Audit

Scale Type	Audit Weight		Measured Weight	
Platform	6.60	lbs, Class F	6.60	lbs
Wood	2.20	lbs, Class F	2.20	lbs
Analytical	0.1000	mg, Class S	0.1000	mg

Post-Test Scale Audit

Scale Type	Audit Weight	Measured Weight
Platform	lbs, Class F	lbs
Wood	lbs, Class F	lbs
Analytical	mg, Class S	mg

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%

ITS Intertek Testing Services

Date: 2001-11-13

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 2 Tech: CLAUDE PABÉ

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.01	0.00	1.70	1.69	0.52	0.49
CO_2	0.03	0.00	16.92	16.9	4.48	5.02
O_2	0.0	0.0	21.5	21.5	6.5	6.50
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.03	1.69	0.54	0.02	0.0	0.02	OK	
CO_2	0.04	16.51	4.45	0.01	0.39	0.03	OK	
O_2	0.0	21.2	6.3	0.0	0.3	0.2	OK	

- Greater than 5% of the range used.

ITS Intertek Testing Services

Date: 2001-11-13

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 0 Tech: CLAUDEPARÉ

FUEL DATA

PRE-TEST LOAD

FUEL DESCRIPTION:
Kindling weight: 3.05 lbs. Consisting of: DOUGLAS FIR 2:10 INCHES Fire lit Time: 00:00

Pre-test load weight: 11.60 lbs. Consisting of: 2X4X 6 inches Time loaded: 00:06:30

Pre-test moisture content: Corrected Dry: 20.5 % Wet: 17.0 %

Test Air Control Settings: COMPLETELY CLOSED Time: 00:30

Test Unit Fan Settings: FAN ON – MAXIMUM RATE Time: 00:00

TEST LOAD

	Lower Limit	Ideal	Upper Limit
Test Load Weight:	9.51 lbs.	10.57 lbs.	11.63 lbs.

Fire Box Volume:	1.51 ft.³	Ideal Length:	15 5/8 inches
Load Volume:	0.212 ft.³	Loading Density:	6.39 lbs/ft³
Number of Spacers	16 ¾x1½x5	Load Density:	36.23 lbs/ft³

Piece Size	Weight	Meter Moisture Content (% dry)*		
13 1/8 x 3 1/2 x 1 1/2 in.	1.50 lbs.	20.4 %	21.5 %	21.3 %
13 1/16 x 3 1/2 x 1 1/2 in.	1.47 lbs.	20.0 %	21.3 %	21.1 %
13 1/16 x 3 1/2 x 1 1/2 in.	1.48 lbs.	20.4 %	18.8 %	21.0 %
13 1/16 x 3 1/2 x 3 1/2 in.	3.23 lbs.	19.4 %	19.8 %	22.0 %
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%

*uncorrected range = 17.9% to 23.1%

TEST LOAD WEIGHT: 9.65 lbs **DRY WEIGHT:** 3.63 kg.

AVERAGE MOISTURE CONTENT:
CORRECTED TO TWO PIN: (DRY) 20.5 % (WET) 17.0 %

COAL BED RANGE:
1.93 lbs. to 2.41 lbs. (20% to 25% of test load)

TEST CHARGE:
Time loaded: 01:39 Coal bed weight: 2.35 lbs. Coal bed weight = 24.4 % of test load weight

CHARCOALIZATION: good|–|–|–|X|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|poor

192-o-9904

ITS Intertek Testing Services

Date: 2001-11-13

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 2 Tech: CLAUDE PARÉ

DILUTION TUNNEL PARTICULATE SAMPLER DATA

FILTER TYPE: Gelman 47mm A/E

Samples in Desiccator Date: Time:

	SYSTEM 1		SYSTEM 2	
	Probe and Front Half Housing # 4	Filter Numbers 5 + 6	Probe and Front Half Housing # 7	Filter Numbers 7 + 8
Post Test Weight:	55.9710 grams	0.4190 grams	61.4385 grams	0.4090 grams
Pre Test Weight:	55.9436 grams	0.2239 grams	61.4058 grams	0.2267 grams
Gain:	0.0274 grams	0.1951 grams	0.0327 grams	0.1823 grams
	a1	b1	a2	b2

Total Gain: a1 + b1 = 0.2285 grams a2 + b2 = 0.2150 grams

Pre-test Weight Record		SYSTEM 1			SYSTEM 2				
		Probe & Housing Number	Front Filter Number	Back Filter Number	Probe & Housing Number	Front Filter Number	Back Filter Number	TEMP	HUMID
Date	Time	4	5	6	7	7	8	°F	%
01-11-12	6h30	55.9437	0.1137	0.1102	61.4063	0.1166	0.1102		
01-11-13	7h00	55.9436	0.1137	0.1102	61.4058	0.1166	0.1102		
		Total			Total				

Post-test Weight Record		SYSTEM 1			SYSTEM 2			TEMP	HUMID
		Probe & Housing Number	Combined Filter Weight Number		Probe & Housing Number	Combined Filter Weight Number			
Date	Time	4	5	6	7	7	8	°F	%
01-11-14	6h45	55.9712	0.3075	0.1115	61.4385	0.2976	0.1116		
01-11-14	16h31	55.9710	0.3075	0.1115	61.4385	0.2974	0.1116		

ITS Intertek Testing Services

Date: 2001-11-13

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 2 Tech: CLAUDE PARÉ

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 30.31 (inches Hg.) Static pressure (P_q) .1425 (inches w.c.)
Inside diameter: Port A 6in. Port B 6in. Tunnel cross sectional area: 0.1963Ft^2
Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)	$\sqrt{\Delta p}$
A-Centroid	3.00	.065	112	0.2550
B-Centroid	3.00	.0625	110	0.2500
A-1	0.40	.065	112	0.2550
A-2	1.50	.070	112	0.2646
A-3	4.50	.0575	110	0.2398
A-4	5.60	.05	98	0.2236
B-1	0.40	.0675	111	0.2598
B-2	1.50	.070	112	0.2646
B-3	4.50	.065	108	0.2550
B-4	5.60	.0475	96	0.2179
		AVERAGE	107	0.2475

Adjustment factor application

0.9804

$$V_s = K_P C_P F_P (\sqrt{\Delta_P}) AVG \sqrt{\frac{T_S}{P_s M_s}} \qquad V_s = K_p C_p (\sqrt{\Delta_p}) avg. \sqrt{\frac{T_s}{P_s M_s}}$$

Where,
C_p = pito tube coefficient = 0.84 for type S pitot
Δ_p = manometer reading (inches H_2O)
T_s = average absolute dilution tunnel temperature (°F + 460)
P_s = absolute dilution tunnel gas pressure or $P_{bar} + P_g$
P_g = static pressure $\frac{inches\ H_2O}{13.6}$

$$F_P = \frac{(\sqrt{\Delta_P})avg}{(\sqrt{\Delta_P})centroid}$$

Adjustment factor for alternative pitot tube placement:

M_s = 28.56, wet molecular weight of stack gas (alternatively, it may be measured)
K_p = 85.49 pitot tube constant, (conversion factor for english units)
$(\sqrt{\Delta_p})avg.$ = average of the square roots of the velocity heads (Δ_p) measured at each traverse point.

$(\sqrt{\Delta_P})centroid$ = average of the square roots of the velocity heads measured at the tunnel centroid (inches of H_2O)

ITS Intertek Testing Services

Date: 2001-11-13

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 2 Tech: CLAUDE PARÉ

TEST DATA LOG

RAW DRY GAS METER READINGS

	System 1	System 2
Final (ft^3)	240.933	270.787
Initial (ft^3)	189.455	222.608

AMBIENT CONDITIONS

	Start	End
Barometer. (inches Hg)	30.31	30.16
Wet Bulb (°F)	58	57
Dry Bulb (°F)	78	75
Humidity (%)	28	30

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SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-14
Run:	3
Project #:	3008830
Test Duration: (minutes)	260

RESULTS

AVERAGE ADJUSTED EMISSION RATE:	53.876
Burn Rate (Dry kg/hr):	0.876

PRESSURE FACTOR:	1.00184

TEMPERATURE FACTORS

DGM #1:	0.98842
DGM #2:	0.98976

VOLUMES SAMPLED

DGM #1:	36.85502
DGM #2:	37.70949
TOTAL TUNNEL VOLUME (scf):	38795.847

SAMPLE RATIOS

Sample Train 1:	1052.661
Sample Train 2:	1028.808

TOTAL EMISSIONS

Sample Train 1 (g):	251.1649
Sample Train 2 (g):	262.3462

EMISSION RATES

Sample Train 1 (g/hr):	57.9611
Sample Train 2 (g/hr):	60.5414

ADJUSTED EMISSION RATES

Sample Train 1 (g/hr):	52.9024
Sample Train 2 (g/hr):	54.8498
DEVIATION:	0.90%

BAROMETRIC PRESSURE

Average:	29.975
Start:	30
End:	29.95

DRY GAS METER VALUES

DGM #1	Final:	278.435
	Initial:	240.992
DGM #2	Final:	308.766
	Initial:	270.850

TEMPERATURES (DEG. RANKIN)

DGM #1:	534.185
DGM #2:	533.463

CALIBRATION FACTORS

DGM #1:	0.9940
DGM #2:	1.0030

TUNNEL FLOW RATE:	149.215

PARTICULATE CATCH (mg)

Sample Train 1:	238.6000
Sample Train 2:	255.0000

ITS Intertek Testing Services

Date: 2001-11-14

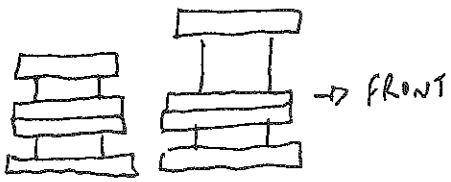
Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 3 Tech: CLAUDE PARÉ

COMMENTS

00:00 START FIRE WITH KINDLING
00:08 STIR THE FIRE, ADD PRETEST LOAD, CLOSE THE DOOR
00:22 REPLACE SOME PIECE OF WOOD
00:29 CLOSE AIR INTAKE
00:38 CLOSE BOOST
01:43 POKE FIRE, ADD TEST LOAD
01:45:30 CLOSE THE DOOR
01:48 CLOSE AIR INTAKE, CLOSE BOOST

TEST LOAD CONFIGURATION



192-k-9904

ITS Intertek Testing Services

Date: 2001-11-14

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 3 Tech: CLAUDE PARÉ

Moisture Meter Calibration Check:

Pre/Post Checks		
Time: —	12: —	22: —

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	<50 fpm	<50 fpm
Smoke Capture Check	OK	OK
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	2001-11-09	
Date Dilution Tunnel Cleaned	2001-11-09	
Induced Draft Check	<0.005	OK
Tunnel Velocity	OK	
Flow Rate 140 cfm ±10%.		149.22
Pitot Leak Check:		
Side A	OK	OK
Side B	OK	OK
Temperature System:		
Ambient (65°- 90°F)		77.50 °F
Wood Heater Surface (±125°F)		-76.0 °F
Proportional Checks:		
CO Analyzer Drift Check		OK
CO_2 Analyzer Check		OK
O_2 Analyzer Check		OK
Thermocouple check		OK

Sampling Train ID Numbers:	Train 1	Train 2
Probe	9	10
Filter Front	9	11
Filter Back	10	12
Filter Thermocouple	12	15
Filter 5G-3 (<90°F)	80	80

Termocouple Identification Number

Flue 1	Room 2	Dilution Tunnel Dry Bulb 3
Dilution Tunnel Wet Bulb 4	Unit Top 5	Unit Back 6
Unit Right Side 7	Unit Left Side 8	Unit Bottom 9
Catalyst/Combustion Chamber 10		

ITS Intertek Testing Services

Date: 2001-11-14

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 300 8830 Run: 3 Tech: CLAUDE PARÉ

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers

	52 SYSTEM 1 23		00 SYSTEM 2 00	
Unplugged Flow Rate = .25cfm	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5	5	5	5
Final 1minute DGM (ft^3)	240.990	278.462	270.852	308.796
Initial 1minute DGM (ft^3)	240.989	278.458	270.847	308.792
Change (C) (ft^3)	0.003	0.004	0.005	0.004
Allowable leakage .04 x Sample rate or .02cfm	0.006	0.006	0.006	0.006
Check OK	ok	ok	ok	ok

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Vacuum (inches Hg.)	5	5
Rotometer Reading (mm)	22	22
Flow Rate (CFM)	0.003	0.003
Allowable (.04 x Sample Rate)	0.006	0.006
Check OK	ok	ok

ITS Intertek Testing Services

Date: 2001-11-14

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 3 Tech: CLAUDE PARÉ

Pre-Test Scale Audit

Scale Type	Audit Weight		Measured Weight	
Platform	6.60	lbs, Class F	6.60	lbs
Wood	2.20	lbs, Class F	2.20	lbs
Analytical	0.1000	mg, Class S	0.1000	mg

Post-Test Scale Audit

Scale Type	Audit Weight	Measured Weight
Platform	lbs, Class F	lbs
Wood	lbs, Class F	lbs
Analytical	mg, Class S	mg

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%

ITS Intertek Testing Services

Date: 2001-11-14

Manufacturer: CHÉMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 3 Tech: CLAUDE PARÉ

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.00	0.00	1.70	1.69	0.53	0.49
CO_2	0.00	0.00	16.95	16.9	4.50	5.02
O_2	0.0	0.0	21.5	21.5	6.5	6.5
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.03	1.73	0.56	0.03	0.04	0.03	ok	
CO_2	0.05	16.70	4.47	0.05	0.02	0.03	ok	
O_2	0.0	21.5	6.5	0.0	0.0	0.0	ok	

- Greater than 3% of the range used.

ITS Intertek Testing Services

Date: 2001-11-14

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3009830 Run: 3 Tech: CLAUDE PARÉ

FUEL DATA
PRE-TEST LOAD

FUEL DESCRIPTION:
Kindling weight: 3.30 lbs. Consisting of: DOUGLAS FIR 2:10 Fire lit Time: 00:00

Pre-test load weight: 11.60 lbs. Consisting of: 2X4X 6 inches Time loaded: 00:08

Pre-test moisture content: Corrected Dry: 19.1 % Wet: 16.0 %

Test Air Control Settings: COMPLETELY CLOSED Time: 00:20

Test Unit Fan Settings: USE WITH THERMODISC Time: —

TEST LOAD

	Lower Limit	Ideal	Upper Limit
Test Load Weight:	9.51 lbs.	10.57 lbs.	11.63 lbs.

Fire Box Volume:	1.51 ft.³	Ideal Length:	15 5/8 inches
Load Volume:	0.221 ft.³	Loading Density:	6.63 lbs/ft³
Number of Spacers	16 ¾x1½x5	Load Density:	35.93 lbs/ft³

Piece Size	Weight	Meter Moisture Content (% dry)*		
13 1/2 x 3 9/16 x 1 1/2 in.	1.48 lbs.	18.7 %	18.7 %	18.8 %
13 1/2 x 3 9/16 x 1 1/2 in.	1.56 lbs.	20.9 %	22.1 %	21.3 %
13 1/2 x 3 9/16 x 1 1/2 in.	1.53 lbs.	17.6 %	18.8 %	18.2 %
13 9/16 x 3 1/2 x 3 1/2 in.	3.37 lbs.	20.4 %	21.7 %	17.5 %
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%

*uncorrected range = 17.9% to 23.1%

TEST LOAD WEIGHT: 10.61 lbs **DRY WEIGHT:** 3.80 kg.

AVERAGE MOISTURE CONTENT:
CORRECTED TO TWO PIN: (DRY) 19.5 % (WET) 16.3 %

COAL BED RANGE:
2.00 lbs. to 2.50 lbs. (20% to 25% of test load)

TEST CHARGE:
Time loaded: 01:43 Coal bed weight: 2.50 lbs. Coal bed weight = 25.0 % of test load weight

CHARCOALIZATION: good|–|–|X|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|poor

192-o-9904

ITS Intertek Testing Services

Date: 2001-11-14

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 3 Tech: CLAUDE PARE

DILUTION TUNNEL PARTICULATE SAMPLER DATA

FILTER TYPE: Gelman 47mm A/E

Samples in Desiccator Date: Time:

	SYSTEM 1		SYSTEM 2	
	Probe and Front Half Housing # 9	Filter Numbers 9 + 10	Probe and Front Half Housing # 10	Filter Numbers 11 + 12
Post Test Weight:	55.1027 grams	0.4303 grams	55.7681 grams	0.4496 grams
Pre Test Weight:	55.0689 grams	0.2255 grams	55.7367 grams	0.2260 grams
Gain:	0.0338 grams	0.2048 grams	0.0314 grams	0.2236 grams
	a1	b1	a2	b2

Total Gain: a1 + b1 = 0.2386 grams a2 + b2 = 0.2550 grams

Pre-test Weight Record		SYSTEM 1 Probe & Housing Number	SYSTEM 1 Front Filter Number	SYSTEM 1 Back Filter Number	SYSTEM 2 Probe & Housing Number	SYSTEM 2 Front Filter Number	SYSTEM 2 Back Filter Number	TEMP	HUMID
Date	Time	9	9	10	10	11	12	°F	%
01-11-13	17h06	55.0689	0.1159	0.1096	55.7367	0.1093	0.1167		
01-11-14	6h45	55.0689	0.1159	0.1096	55.7367	0.1093	0.1167		
		Total			Total				

Post-test Weight Record		SYSTEM 1 Probe & Housing Number	SYSTEM 1 Combined Filter Weight Number		SYSTEM 2 Probe & Housing Number	SYSTEM 2 Combined Filter Weight Number		TEMP	HUMID
Date	Time	9	9	10	10	11	12	°F	%
01-11-15	7h05	55.1029	0.3195	0.1110	55.7682	0.3314	0.1182		
01-11-15	10h18	55.1027	0.3193	0.1110	55.7681	0.3314	0.1182		

ITS Intertek Testing Services

Date: 2001-11-14

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 3 Tech: CLAUDE PARÉ

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 30.00 (inches Hg.) Static pressure (P_q) 0,145 (inches w.c.)
Inside diameter: Port A 6in. Port B 6in. Tunnel cross sectional area: 0.1963Ft²
Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)	$\sqrt{\Delta p}$
A-Centroid	3.00	0,0675	109	0.2598
B-Centroid	3.00	0,065	112	0.2550
A-1	0.40	0,0625	111	0.2500
A-2	1.50	0,0675	111	0.2598
A-3	4.50	0,060	110	0.2449
A-4	5.60	0,0525	96	0.2291
B-1	0.40	0,070	112	0.2646
B-2	1.50	0,070	112	0.2646
B-3	4.50	0,065	109	0.2550
B-4	5.60	0,050	96	0.2236
		AVERAGE	107	0.2489

Adjustment factor application

0.9672

$$V_s = K_P C_P F_P (\sqrt{\Delta_P})AVG \sqrt{\frac{T_S}{P_s M_s}} \qquad V_s = K_p C_p (\sqrt{\Delta_p})avg. \sqrt{\frac{T_s}{P_s M_s}}$$

Where,
C_p = pito tube coefficient = 0.84 for type S pitot
Δ_p = manometer reading (inches H_2O)
T_s = average absolute dilution tunnel temperature (°F + 460)
P_s = absolute dilution tunnel gas pressure or $P_{bar} + P_g$
P_g = static pressure $\frac{inches\ H_2O}{13.6}$

$$F_P = \frac{(\sqrt{\Delta_P})avg}{(\sqrt{\Delta_P})centroid}$$

Adjustment factor for alternative pitot tube placement:

M_s = 28.56, wet molecular weight of stack gas (alternatively, it may be measured)
K_p = 85.49 pitot tube constant, (conversion factor for english units)
$(\sqrt{\Delta_p})avg.$ = average of the square roots of the velocity heads (Δ_p) measured at each traverse point.

$(\sqrt{\Delta_p})centroid$ = average of the square roots of the velocity heads measured at the tunnel centroid (inches of H_2O)

ITS Intertek Testing Services

Date: 2001-11-14

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 300830 Run: 3 Tech: CLAUDE PARÉ

TEST DATA LOG

RAW DRY GAS METER READINGS

	System 1	System 2
Final (ft^3)	278.435	308.766
Initial (ft^3)	240.997	270.850

AMBIENT CONDITIONS

	Start	End
Barometer. (inches Hg)	30.00	29.95
Wet Bulb (°F)	59	59
Dry Bulb (°F)	78	76
Humidity (%)	30	34

ITS Intertek Testing Services

Project #: 300 8830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-14 Run #: 3 Sheet # 12 of 12

Time loaded: 01:43

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
240	0.20	1.66	2.19	17.1	208	79	86	273	293	297	260	236	—	—	2.0	275.562	60	305.941	55	75	74	73	74	74	74	0.0575	0.0325	OK
250	0.05	1.61	2.05	17.2	205	77	86	263	284	294	258	238	—	—	2.0	276.997	60	307.351	55	75	74	73	74	73	74	0.060	0.0325	OK
260	0.00	1.54	2.01	17.3	202	77	85	259	275	290	255	239	—	—	2.0	278.435	60	308.766	55	75	74	74	74	74	75	0.060	0.0325	OK

Technician: CLAUDE LABÉ

☐ *Pre Test* ☒ *Test*

192-v-9904

ITS Intertek Testing Services

Project #: 300 8830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-14 Run #: 3 Sheet # 11 of 12

Time loaded: 01:43

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	10.00	0.46	4.28	16.5	346	80	159	383	369	374	333	239			2.0	240.992	60	270.850	55	73	72	79	72	72	79	0.0575	0.045	OK
10	8.50	0.59	4.44	16.4	381	78	114	497	362	362	323	245			2.0	242.442	60	272.300	55	74	73	80	73	73	80	0.0625	0.055	OK
20	8.05	0.63	2.32	18.8	304	78	102	342	336	339	303	250			2.0	243.873	60	273.736	55	74	73	77	73	73	78	0.0625	0.0475	OK
30	7.75	0.77	1.20	18.9	262	77	96	277	295	310	277	249			2.0	245.323	60	275.199	55	74	73	76	73	73	77	0.0625	0.040	OK
40	7.40	0.92	1.20	18.7	236	77	93	249	266	286	262	243			2.0	246.780	60	276.678	55	75	73	75	73	73	75	0.0625	0.0375	OK
50	6.95	1.27	1.46	18.3	221	77	91	243	249	268	243	239			2.0	248.233	60	278.155	55	75	73	74	74	73	75	0.0625	0.035	OK
60	6.30	1.65	1.86	17.8	216	76	89	240	240	254	231	235			2.0	249.673	60	279.623	55	75	73	74	74	73	74	0.0625	0.035	OK
70	5.45	2.05	2.42	17.2	218	76	89	250	241	246	223	231			2.0	251.090	60	281.065	55	75	73	73	74	73	75	0.0625	0.035	OK
80	4.55	2.32	2.86	16.8	221	76	88	268	254	245	222	228			2.0	252.540	60	282.515	55	75	73	73	74	73	74	0.065	0.035	OK
90	3.90	2.43	2.92	16.4	221	77	87	276	272	245	220	226			2.0	253.958	60	283.914	55	75	74	73	74	73	74	0.065	0.035	OK
100	3.45	2.39	2.90	16.1	222	77	87	288	285	249	224	225			2.0	255.416	60	285.385	55	75	73	73	74	73	74	0.0625	0.035	OK
110	3.05	2.24	3.01	16.0	222	77	87	294	294	255	230	223			2.0	256.879	60	286.868	55	75	73	73	74	73	74	0.065	0.035	OK
120	2.75	2.15	2.97	16.0	222	77	87	292	303	264	241	223			2.0	258.337	60	288.336	55	75	74	73	74	73	74	0.060	0.035	OK
130	2.40	2.07	2.97	16.1	223	77	87	296	309	272	249	225			2.0	259.792	60	289.807	55	75	74	73	74	73	74	0.060	0.035	OK
140	2.10	2.02	2.94	16.2	222	78	87	297	310	280	256	225			2.0	261.240	60	291.262	55	75	74	73	74	73	74	0.060	0.035	OK
150	1.80	1.99	2.92	16.2	223	78	87	298	311	288	260	227			2.0	262.684	60	292.713	55	75	74	73	74	73	74	0.060	0.035	OK
160	1.45	2.01	2.97	16.2	224	78	87	300	310	293	264	228			2.0	264.122	60	294.143	55	75	74	73	74	73	74	0.060	0.035	OK
170	1.25	1.94	2.85	16.4	222	78	87	294	312	298	268	228			2.0	265.550	60	295.561	55	75	74	73	74	73	75	0.060	0.035	OK
180	1.05	1.92	2.69	16.4	221	78	87	294	312	299	268	230			2.0	266.982	60	297.047	55	75	74	74	74	73	75	0.060	0.035	OK
190	0.90	1.87	2.59	16.5	219	78	87	288	308	301	266	232			2.0	268.411	60	298.554	55	75	74	74	74	73	75	0.060	0.035	OK
200	0.75	1.83	2.56	16.5	218	78	87	288	308	302	265	233			2.0	269.841	60	300.049	55	75	74	74	74	74	75	0.060	0.035	OK
210	0.60	1.84	2.54	16.6	217	78	87	282	307	302	266	235			2.0	271.264	60	301.536	55	75	74	73	74	74	74	0.060	0.035	OK
220	0.45	1.78	2.51	16.7	215	78	87	281	304	302	267	235			2.0	272.687	60	303.019	55	75	74	73	74	73	74	0.060	0.035	OK
230	0.30	1.75	2.45	16.7	213	78	86	280	300	300	264	235			2.0	274.126	60	304.516	55	75	74	73	74	74	74	0.0575	0.035	OK

Technician: CLAUDE PARÉ

☐ *Pre Test* ☒ *Test*

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-14 Run #: 3 Sheet # 10 of 12

Time loaded: 01:43

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
					513	81	124	713	353	295	299	166								74	73	75	73	72	75			
					469	81	118	615	361	328	320	191								74	73	76	73	73	76			
					444	82	115	592	363	347	324	206								74	73	77	73	73	77			
					421	81	113	576	372	362	331	216								72	71	77	71	72	77			
					399	80	110	564	373	370	335	225								72	72	78	71	72	78			
					378	81	108	516	376	375	336	234								73	72	78	72	72	78			
					341	80	104	440	380	373	331	239								73	72	79	72	72	78			

Technician: CLAUDE PARÉ

☒ *Pre Test* ☐ *Test*

192-v-9904

INTERTEK TESTING SERVICES NA Ltd.

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-20
Run:	4
Project #:	3008830
Test Duration: (minutes)	230

RESULTS

AVERAGE ADJUSTED EMISSION RATE: 3.932

Burn Rate (Dry kg/hr): 0.971

PRESSURE FACTOR: 0.99248

TEMPERATURE FACTORS

DGM #1:	0.98873
DGM #2:	0.99015

VOLUMES SAMPLED

DGM #1:	43.90872
DGM #2:	33.02542

TOTAL TUNNEL VOLUME (scf): 32604.090

SAMPLE RATIOS

Sample Train 1:	742.543
Sample Train 2:	987.242

TOTAL EMISSIONS

Sample Train 1 (g):	9.1333
Sample Train 2 (g):	10.2673

EMISSION RATES

Sample Train 1 (g/hr):	2.3826
Sample Train 2 (g/hr):	2.6784

ADJUSTED EMISSION RATES

Sample Train 1 (g/hr):	3.7413
Sample Train 2 (g/hr):	4.1230

DEVIATION: 2.43%

BAROMETRIC PRESSURE

Average:	29.695
Start:	29.69
End:	29.7

DRY GAS METER VALUES

DGM #1	Final:	323.478
	Initial:	278.462
DGM #2	Final:	342.365
	Initial:	308.859

TEMPERATURES (DEG. RANKIN)

DGM #1:	534.021
DGM #2:	533.250

CALIBRATION FACTORS

DGM #1:	0.9940
DGM #2:	1.0030

TUNNEL FLOW RATE: 141.757

PARTICULATE CATCH (mg)

Sample Train 1:	12.3000
Sample Train 2:	10.4000

ITS Intertek Testing Services

Date: 2001-11-20

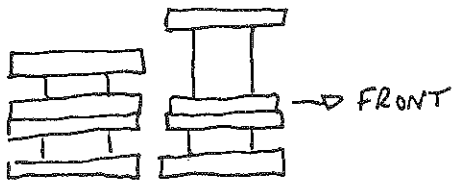
Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 4 Tech: CLAUDE PARÉ

COMMENTS

00:00 START FIRÉ WITH KINDLING, DOOR CLOSED 6 MIN. LATER
00:06 STIR THE FIRE, ADD PRETEST LOAD
00:26 CLOSE ~~FUEL~~ AIR INTAKE
00:34 CLOSE BOOST
01:36 POKE FIRE, ADD TEST LOAD
01:38:30 CLOSE THE DOOR
01:41 CLOSE AIR INTAKE, CLOSE BOOST

TEST LOAD CONFIGURATION



192-k-9904

ITS Intertek Testing Services

Date: 2001-11-20

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 4 Tech: CLAUDE PARÉ

Moisture Meter Calibration Check:

Pre/Post Checks		
Time: —	12: —	22: —

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	450 fpm	450 fpm
Smoke Capture Check	ok	ok
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	2001-11-09	
Date Dilution Tunnel Cleaned	2001-11-09	
Induced Draft Check	<0.005	ok
Tunnel Velocity	ok	
Flow Rate 140 cfm ±10%.		141.76
Pitot Leak Check:		
Side A	ok	ok
Side B	ok	ok
Temperature System:		
Ambient (65°- 90°F)		81.29 °F
Wood Heater Surface (±125°F)		65.8 °F
Proportional Checks:		
CO Analyzer Drift Check		ok
CO_2 Analyzer Check		ok
O_2 Analyzer Check		ok
Thermocouple check		ok

Sampling Train ID Numbers:	Train 1	Train 2
Probe	4	7
Filter Front	13	15
Filter Back	14	16
Filter Thermocouple	12	15
Filter 5G-3 (<90°F)	83	81

Termocouple Identification Number

Flue 1
Dilution Tunnel Wet Bulb 4
Unit Right Side 7
Catalyst/Combustion Chamber 10
Room 2
Unit Top 5
Unit Left Side 8
Dilution Tunnel Dry Bulb 3
Unit Back 6
Unit Bottom 9

ITS Intertek Testing Services

Date: 2001-11-20

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 4 Tech: CLAUDE PARÉ

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers

	36 SYSTEM 1 45		41 SYSTEM 2 05	
Unplugged Flow Rate = .25cfm	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5	5	5	5
Final 1minute DGM (ft^3)	278.464	323.513	308.862	342.402
Initial 1minute DGM (ft^3)	278.461	323.509	308.860	342.398
Change (C) (ft^3)	0.003	0.004	0.002	0.004
Allowable leakage .04 x Sample rate or .02cfm	0.008	0.008	0.006	0.006
Check OK	ok	ok	ok	ok

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Vacuum (inches Hg.)	5	5
Rotometer Reading (mm)	15	15
Flow Rate (CFM)	0.002	0.002
Allowable (.04 x Sample Rate)	0.008	0.008
Check OK	ok	ok

ITS Intertek Testing Services

Date: 2001-11-20

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3009830 Run: 4 Tech: CLAUDE PARÉ

Pre-Test Scale Audit

Scale Type	Audit Weight		Measured Weight	
Platform	6.60	lbs, Class F	6.60	lbs
Wood	2.20	lbs, Class F	2.20	lbs
Analytical	0.1000	mg, Class S	0.1000	mg

Post-Test Scale Audit

Scale Type	Audit Weight	Measured Weight
Platform	lbs, Class F	lbs
Wood	lbs, Class F	lbs
Analytical	mg, Class S	mg

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%

ITS Intertek Testing Services

Date: 2001-11-20

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 4 Tech: CLAUDE PARÉ

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.01	0.00	1.69	1.69	0.52	0.49
CO_2	0.01	0.00	16.95	16.9	4.61	5.02
O_2	0.0	0.0	21.6	21.5	6.6	6.5
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.01	1.69	0.53	0.00	0.00	0.01	ok	
CO_2	0.04	16.69	4.49	0.03	0.26	0.12	ok	
O_2	0.1	21.1	6.3	0.1	0.5	0.3	ok	

- Greater than 5% of the range used.

ITS Intertek Testing Services

Date: 2001-11-20

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 4 Tech: CLAUDE PARÉ

FUEL DATA
PRE-TEST LOAD

FUEL DESCRIPTION:
Kindling weight: 3.05 lbs. Consisting of: DOUGLAS FIR 2:10" Fire lit Time: 00:00

Pre-test load weight: 11.50 lbs. Consisting of: 2X4X 6 inches Time loaded: 00:06

Pre-test moisture content: Corrected Dry: 20.0 % Wet: 16.7 %

Test Air Control Settings: COMPLETELY CLOSED Time: 00:26

Test Unit Fan Settings: USE WITH THERMODISC Time: —

TEST LOAD

	Lower Limit	Ideal	Upper Limit
Test Load Weight:	9.51 lbs.	10.57 lbs.	11.63 lbs.

Fire Box Volume:	1.51 ft.³	Ideal Length:	15 7/8 inches
Load Volume:	0.238 ft.³	Loading Density:	6.60 lbs/ft³
Number of Spacers	16 ¾x1½x5	Load Density:	34.70 lbs/ft³

Piece Size	Weight	Meter Moisture Content (% dry)*		
14 1/8 x 3 9/16 x 1 1/2 in.	1.75 lbs.	19.9 %	21.1 %	20.4 %
14 1/8 x 3 9/16 x 1 1/2 in.	1.58 lbs.	22.7 %	23.0 %	22.7 %
14 1/8 x 3 9/16 x 1 1/2 in.	1.75 lbs.	20.9 %	20.5 %	20.3 %
14 3/16 x 3 1/2 x 3 1/2 in.	2.97 lbs.	21.1 %	21.1 %	21.6 %
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%

*uncorrected range = 17.9% to 23.1%

TEST LOAD WEIGHT: 9.97 lbs DRY WEIGHT: 3.73 kg.

AVERAGE MOISTURE CONTENT:
CORRECTED TO TWO PIN: (DRY) 21.2 % (WET) 17.5 %

COAL BED RANGE:
1.99 lbs. to 2.49 lbs. (20% to 25% of test load)

TEST CHARGE:
Time loaded: 01:36 Coal bed weight: 2.30 lbs. Coal bed weight = 23.1 % of test load weight

CHARCOALIZATION: good|--|--|X|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|poor

192-o-9904

ITS Intertek Testing Services

Date: 2001-11-20

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 4 Tech: CLAUDE PARÉ

DILUTION TUNNEL PARTICULATE SAMPLER DATA

FILTER TYPE: Gelman 47mm A/E

Samples in Desiccator Date: Time:

	SYSTEM 1		SYSTEM 2	
	Probe and Front Half Housing # 4	Filter Numbers 13+14	Probe and Front Half Housing # 7	Filter Numbers 15+16
Post Test Weight:	55.9558 grams	0.2372 grams	61.4224 grams	0.2369 grams
Pre Test Weight:	55.9553 grams	0.2254 grams	61.4220 grams	0.2269 grams
Gain:	0.0005 grams	0.0118 grams	0.0004 grams	0.0100 grams
	a1	b1	a2	b2

Total Gain: a1 + b1 = 0.0123 grams a2 + b2 = 0.0104 grams

Pre-test Weight Record		SYSTEM 1 Probe & Housing Number	SYSTEM 1 Front Filter Number	SYSTEM 1 Back Filter Number	SYSTEM 2 Probe & Housing Number	SYSTEM 2 Front Filter Number	SYSTEM 2 Back Filter Number	TEMP	HUMID
Date	Time	4	13	14	7	15	16	°F	%
01-11-19	19h20	55.9557	0.1148	0.1106	61.4225	0.1108	0.1161		
01-11-20	9h21	55.9553	0.1148	0.1106	61.4220	0.1108	0.1161		
		Total			Total				

Post-test Weight Record		SYSTEM 1 Probe & Housing Number	SYSTEM 1 Combined Filter Weight Number		SYSTEM 2 Probe & Housing Number	SYSTEM 2 Combined Filter Weight Number		TEMP	HUMID
Date	Time	4	13	14	7	15	16	°F	%
01-11-21	6h33	55.9558	0.1259	0.1114	61.4224	0.1206	0.1164		
01-11-21	8h35	55.9558	0.1258	0.1114	61.4224	0.1205	0.1164		

ITS Intertek Testing Services

Date: 2001-11-20

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 4 Tech: CLAUDE PARÉ

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 29.69 (inches Hg.) Static pressure (P_q) 0,1375 (inches w.c.)

Inside diameter: Port A 6in. Port B 6in. Tunnel cross sectional area: 0.1963Ft^2

Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)	$\sqrt{\Delta p}$
A-Centroid	3.00	0,0625	111	0.2500
B-Centroid	3.00	0,0625	110	0.2500
A-1	0.40	0,0650	111	0.2550
A-2	1.50	0,0600	111	0.2449
A-3	4.50	0,0600	110	0.2449
A-4	5.60	0,0525	98	0.2291
B-1	0.40	0,0600	110	0.2449
B-2	1.50	0,0675	110	0.2598
B-3	4.50	0,0600	110	0.2449
B-4	5.60	0,0475	97	0.2179
		AVERAGE	107	0.2427

Adjustment factor application

0,9708

$$V_s = K_P C_P F_P (\sqrt{\Delta_P}) AVG \sqrt{\frac{T_S}{P_s M_s}} \qquad V_s = K_p C_p (\sqrt{\Delta_p}) avg. \sqrt{\frac{T_s}{P_s M_s}}$$

Where,

C_p = pito tube coefficient = 0.84 for type S pitot

Δ_p = manometer reading (inches H_2O)

T_s = average absolute dilution tunnel temperature (°F + 460)

P_s = absolute dilution tunnel gas pressure or $P_{bar} + P_g$

P_g = static pressure $\frac{inches\ H_2O}{13.6}$

$$F_P = \frac{(\sqrt{\Delta_P})avg}{(\sqrt{\Delta_P})centroid}$$

Adjustment factor for alternative pitot tube placement:

M_s = 28.56, wet molecular weight of stack gas (alternatively, it may be measured)

K_p = 85.49 pitot tube constant, (conversion factor for english units)

$(\sqrt{\Delta_p})avg.$ = average of the square roots of the velocity heads (Δ_p) measured at each traverse point.

$(\sqrt{\Delta_p})centroid$ = average of the square roots of the velocity heads measured at the tunnel centroid (inches of H_2O)

ITS Intertek Testing Services

Date: 2001-11-20

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 4 Tech: CLAUDE PARÉ

TEST DATA LOG

RAW DRY GAS METER READINGS

	System 1	System 2
Final (ft^3)	323.478	342.365
Initial (ft^3)	278.462	308.859

AMBIENT CONDITIONS

	Start	End
Barometer. (inches Hg)	29.69	29.70
Wet Bulb (°F)	58	59
Dry Bulb (°F)	77	79
Humidity (%)	29	28

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-20 Run #: 4 Sheet # 11 of 11

Time loaded: 01:36

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	9.95	0.21	5.14	15.1	380	80	170	419	402	372	337	241	—	—	2.0	278.462	55	308.859	55	73	72	78	72	72	78	0.055	0.055	ok
10	8.70	0.49	5.56	14.5	437	80	121	547	399	374	342	250	—	—	2.0	280.547	55	310.342	55	74	72	83	73	72	81	0.060	0.060	ok
20	7.15	0.35	5.16	14.4	414	81	115	522	380	367	333	256	—	—	2.0	282.517	55	311.826	55	74	73	79	73	72	79	0.060	0.0575	ok
30	6.15	0.45	5.16	13.6	414	80	114	563	366	361	326	256	—	—	2.0	284.498	55	313.246	55	74	72	77	73	72	77	0.060	0.0575	ok
40	4.95	0.50	7.23	12.1	435	83	116	627	375	372	331	255	—	—	2.0	286.466	55	314.671	55	74	73	76	73	72	76	0.0575	0.060	ok
50	3.75	0.71	8.25	11.3	452	85	118	670	396	388	342	255	—	—	2.0	288.455	55	316.144	55	75	73	76	74	73	76	0.060	0.0625	ok
60	2.90	0.35	7.73	12.0	445	86	117	652	411	405	355	256	—	—	2.0	290.437	55	317.622	55	75	73	76	74	73	76	0.060	0.060	ok
70	2.40	0.20	5.92	14.4	406	85	113	515	419	411	360	256	—	—	2.0	292.387	55	319.082	55	75	73	76	74	73	76	0.060	0.055	ok
80	2.05	0.29	4.60	15.1	372	84	109	449	414	408	357	256	—	—	2.0	294.420	55	320.574	55	75	73	77	74	73	77	0.055	0.0525	ok
90	1.75	0.26	4.35	14.9	356	83	107	433	404	402	351	256	—	—	2.0	296.376	55	322.027	55	75	74	78	74	73	77	0.055	0.050	ok
100	1.60	0.53	4.16	15.7	329	82	104	397	395	399	346	256	—	—	2.0	298.315	55	323.471	55	75	74	78	74	73	78	0.055	0.045	ok
110	1.40	0.75	3.40	15.8	308	82	102	369	376	392	344	260	—	—	2.0	300.243	55	324.920	55	75	74	78	74	73	78	0.055	0.0425	ok
120	1.25	0.83	3.37	15.7	294	81	100	350	359	383	337	264	—	—	2.0	302.174	55	326.372	55	75	74	77	74	74	78	0.055	0.0425	ok
130	1.10	0.98	3.26	15.8	282	81	98	335	344	375	330	269	—	—	2.0	304.108	55	327.826	55	75	74	77	74	74	77	0.055	0.040	ok
140	1.00	1.19	2.98	16.3	271	79	98	324	331	369	325	274	—	—	2.0	306.041	55	329.279	55	74	73	78	73	72	78	0.055	0.0375	ok
150	0.90	1.05	2.75	16.4	260	79	95	314	326	360	316	276	—	—	2.0	307.980	55	330.735	55	74	73	77	73	73	78	0.055	0.0375	ok
160	0.75	1.00	2.74	16.3	252	79	94	309	324	350	312	276	—	—	2.0	309.912	55	332.189	55	75	73	77	74	73	77	0.055	0.0375	ok
170	0.60	1.00	2.73	16.3	246	80	94	308	321	344	307	276	—	—	2.0	311.852	55	333.644	55	75	74	75	74	73	77	0.055	0.035	ok
180	0.50	1.08	2.71	16.4	242	81	93	307	316	338	297	276	—	—	2.0	313.792	55	335.098	55	75	74	74	74	73	77	0.055	0.035	ok
190	0.40	1.16	2.66	16.4	238	81	93	302	310	333	294	276	—	—	2.0	315.726	55	336.549	55	75	74	74	74	73	78	0.055	0.035	ok
200	0.25	1.10	2.49	16.5	235	80	93	296	305	328	287	274	—	—	2.0	317.668	55	338.001	55	75	74	73	74	73	78	0.055	0.035	ok
210	0.15	1.11	2.46	16.5	231	80	92	294	306	324	285	274	—	—	2.0	319.602	55	339.453	55	75	74	73	74	73	78	0.055	0.035	ok
220	0.05	1.03	2.39	16.8	228	80	92	291	300	318	282	273	—	—	2.0	321.545	55	340.910	55	75	74	73	74	73	77	0.055	0.0325	ok
230	0.00	0.91	2.43	16.7	226	79	92	286	296	313	276	271	—	—	2.0	323.478	55	342.365	55	75	74	74	74	73	78	0.0575	0.0325	ok

Technician: CLAUDE PARÉ

☐ *Pre Test* ☒ *Test*

192-v-9904

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-20 Run #: 4 Sheet # 10 of 11

Time loaded: 01:36

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
					579	75	131	764	299	233	229	137								67	67	71	67	68	74			
					508	77	120	684	354	295	283	169								69	68	73	68	69	74			
					470	78	116	631	378	316	294	182								71	70	74	70	70	75			
					451	79	114	593	389	333	308	195								72	71	74	71	71	76			
					425	79	112	530	390	343	316	205								72	71	75	71	71	76			
					410	81	111	533	394	352	320	218								73	72	76	72	72	77			
					388	81	110	488	404	365	327	232								73	72	78	72	72	78			

Technician: CLAUDE PARÉ

☒ *Pre Test* ☐ *Test*

192-v-9904

INTERTEK TESTING SERVICES NA Ltd.

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-21
Run:	5
Project #:	3008830
Test Duration: (minutes)	260

RESULTS

AVERAGE ADJUSTED EMISSION RATE: 2.465

Burn Rate (Dry kg/hr): 0.863

PRESSURE FACTOR: 0.99749

TEMPERATURE FACTORS

DGM #1:	0.98719
DGM #2:	0.98842

VOLUMES SAMPLED

DGM #1:	37.18192
DGM #2:	38.72241

TOTAL TUNNEL VOLUME (scf): 38573.682

SAMPLE RATIOS

Sample Train 1:	1037.431
Sample Train 2:	996.159

TOTAL EMISSIONS

Sample Train 1 (g):	6.0171
Sample Train 2 (g):	6.4750

EMISSION RATES

Sample Train 1 (g/hr):	1.3886
Sample Train 2 (g/hr):	1.4942

ADJUSTED EMISSION RATES

Sample Train 1 (g/hr):	2.3900
Sample Train 2 (g/hr):	2.5400

DEVIATION: 1.52%

BAROMETRIC PRESSURE

Average:	29.845
Start:	29.89
End:	29.8

DRY GAS METER VALUES

DGM #1	Final:	361.535
	Initial:	323.548
DGM #2	Final:	381.595
	Initial:	342.438

TEMPERATURES (DEG. RANKIN)

DGM #1:	534.852
DGM #2:	534.185

CALIBRATION FACTORS

DGM #1:	0.9940
DGM #2:	1.0030

TUNNEL FLOW RATE: 148.360

PARTICULATE CATCH (mg)

Sample Train 1:	5.8000
Sample Train 2:	6.5000

ITS Intertek Testing Services

Date: 2001-11-21

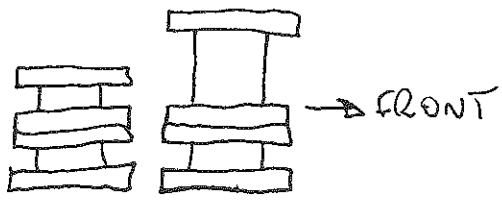
Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 5 Tech: CLAUDE PARÉ

COMMENTS

00:00 START FIRE WITH KINDLING, DOOR CLOSED 8 MINUTES LATER
00:08 STIR THE FIRE, ADD PRETEST LOAD
00:26 CLOSE AIR INTAKE
00:37 CLOSE ~~[illegible]~~ BOOST
01:46 POKE FIRE, ADD TEST LOAD
01:48:30 CLOSE THE DOOR
01:51 CLOSE AIR INTAKE, CLOSE BOOST

TEST LOAD CONFIGURATION



192-k-9904

ITS Intertek Testing Services

Date: 2001-11-21

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 5 Tech: CLAUDE PARÉ

Moisture Meter Calibration Check:

Pre/Post Checks		
Time: —	12: —	22: —

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	<50 fpm	<50 fpm
Smoke Capture Check	ok	ok
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	2001-11-09	
Date Dilution Tunnel Cleaned	2001-11-09	
Induced Draft Check	<0.005	ok
Tunnel Velocity	ok	
Flow Rate 140 cfm ±10%.		148.47
Pitot Leak Check:		
Side A	ok	ok
Side B	ok	ok
Temperature System:		
Ambient (65°- 90°F)		80.15 °F
Wood Heater Surface (±125°F)		-86.8 °F
Proportional Checks:		
CO Analyzer Drift Check		ok
CO_2 Analyzer Check		ok
O_2 Analyzer Check		ok
Thermocouple check		ok

Sampling Train ID Numbers:	Train 1	Train 2
Probe	9	10
Filter Front	17	19
Filter Back	18	20
Filter Thermocouple	12	15
Filter 5G-3 (<90°F)	81	82

Termocouple Identification Number

Flue 1
Dilution Tunnel Wet Bulb 4
Unit Right Side' 7
Catalyst/Combustion Chamber 10
Room 2
Unit Top 5
Unit Left Side 8
Dilution Tunnel Dry Bulb 3
Unit Back 6
Unit Bottom 9

ITS Intertek Testing Services

Date: 2001-11-21

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 5 Tech: CLAUDÉ PARÉ

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers

	SYSTEM 1		33 SYSTEM 2 35	
Unplugged Flow Rate = .25cfm	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5	5	5	5
Final 1minute DGM (ft^3)	323.547	361.572	342.439	381.627
Initial 1minute DGM (ft^3)	323.545	361.569	342.435	381.622
Change (C) (ft^3)	0.002	0.003	0.004	0.005
Allowable leakage .04 x Sample rate or .02cfm	0.006	0.006	0.006	0.006
Check OK	ok	ok	ok	ok

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Vacuum (inches Hg.)	5	5
Rotometer Reading (mm)	20	20
Flow Rate (CFM)	0.003	0.003
Allowable (.04 x Sample Rate)	0.006	0.006
Check OK	ok	ok

ITS Intertek Testing Services

Date: 2001-11-21

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 5 Tech: CLAUDE PARÉ

Pre-Test Scale Audit

Scale Type	Audit Weight	Measured Weight
Platform	6.60 lbs, Class F	6.60 lbs
Wood	2.20 lbs, Class F	2.20 lbs
Analytical	0.1000 mg, Class S	0.1000 mg

Post-Test Scale Audit

Scale Type	Audit Weight	Measured Weight
Platform	lbs, Class F	lbs
Wood	lbs, Class F	lbs
Analytical	mg, Class S	mg

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%

ITS Intertek Testing Services

Date: 2001-11-21

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 5 Tech: CLAUDE PARÉ

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.00	0.00	1.70	1.69	0.52	0.49
CO_2	0.03	0.00	16.98	16.9	4.50	5.02
O_2	0.0	0.0	21.5	21.5	6.50	6.50
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.03	1.73	0.55	0.03	0.03	0.03	ok	
CO_2	0.05	16.51	4.46	0.02	0.47	0.04	ok	
O_2	0.0	21.6	6.5	0.0	0.1	0.0	ok	

- Greater than 5% of the range used.

ITS Intertek Testing Services

Date: 2001-11-21

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 5 Tech: CLAUDE PARÉ

FUEL DATA
PRE-TEST LOAD

FUEL DESCRIPTION:
Kindling weight: 2.90 lbs. Consisting of: DOUGLAS FIR Fire lit Time: 00:00

Pre-test load weight: 11.45 lbs. Consisting of: 2X4X 2:10 INCHES 6 inches Time loaded: 00:08

Pre-test moisture content: Corrected Dry: 20.2 % Wet: 16.8 %

Test Air Control Settings: COMPLETY CLOSED Time: 00:26

Test Unit Fan Settings: USE WITH THERMODISC Time: —

TEST LOAD

	Lower Limit	Ideal	Upper Limit
Test Load Weight:	9.51 lbs.	10.57 lbs.	11.63 lbs.

Fire Box Volume:	1.51 ft.³	Ideal Length:	15 5/8 inches
Load Volume:	0.214 ft.³	Loading Density:	6.61 lbs/ft³
Number of Spacers	16 ¾x1½x5	Load Density:	37.66 lbs/ft³

Piece Size	Weight	Meter Moisture Content (% dry)*		
13 3/16 x 3 1/2 x 1 1/2 in.	1.44 lbs.	22.4 %	22.8 %	22.7 %
13 3/16 x 3 1/2 x 1 1/2 in.	1.66 lbs.	19.7 %	20.6 %	20.4 %
13 3/16 x 3 1/2 x 1 1/2 in.	1.62 lbs.	19.7 %	20.5 %	20.3 %
13 3/16 x 3 1/2 x 3 1/2 in.	3.34 lbs.	19.2 %	19.5 %	21.2 %
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%

*uncorrected range = 17.9% to 23.1%

TEST LOAD WEIGHT: 9.98 lbs **DRY WEIGHT:** 3.75 kg.

AVERAGE MOISTURE CONTENT:
CORRECTED TO TWO PIN: (DRY) 20.7 % (WET) 17.1 %

COAL BED RANGE:
2.00 lbs. to 2.50 lbs. (20% to 25% of test load)

TEST CHARGE:
Time loaded: 01:46 Coal bed weight: 2.45 lbs. Coal bed weight = 24.5 % of test load weight

CHARCOALIZATION: good|--|--|X|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|poor

192-o-9904

ITS Intertek Testing Services

Date: 2001-11-21

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 5 Tech: CLAUDE PARÉ

DILUTION TUNNEL PARTICULATE SAMPLER DATA

FILTER TYPE: Gelman 47mm A/E

Samples in Desiccator Date: Time:

SYSTEM 1		SYSTEM 2	
Probe and Front Half Housing # 9	Filter Numbers 17 + 18	Probe and Front Half Housing # 10	Filter Numbers 19+20

Post Test Weight:	55.0874 grams	0.2327 grams	55.7524 grams	0.2330 grams
Pre Test Weight:	55.0867 grams	0.2276 grams	55.7521 grams	0.2268 grams
Gain:	0.0007 grams	0.0051 grams	0.0003 grams	0.0062 grams
	a1	b1	a2	b2

Total Gain: a1 + b1 = 0.0058 grams a2 + b2 = 0.0065 grams

		SYSTEM 1			SYSTEM 2				
Pre-test Weight Record		Probe & Housing Number	Front Filter Number	Back Filter Number	Probe & Housing Number	Front Filter Number	Back Filter Number	TEMP	HUMID
Date	Time	9	17	18	10	19	20	°F	%
01-11-20	16h39	55.0869	0.1100	0.1176	55.7526	0.1164	0.1104		
01-11-21	8h35	55.0867	0.1100	0.1176	55.7521	0.1164	0.1104		
		Total			Total				

		SYSTEM 1			SYSTEM 2				
Post-test Weight Record		Probe & Housing Number	Combined Filter Weight Number		Probe & Housing Number	Combined Filter Weight Number		TEMP	HUMID
Date	Time	9	17	18	10	19	20	°F	%
01-11-22	6h56	55.0879	0.1152	0.1177	55.7525	0.1222	0.1109		
01-11-22	14h15	55.0874	0.1151	0.1176	55.7524	0.1221	0.1109		

ITS Intertek Testing Services

Date: 2001-11-21

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 5 Tech: CLAUDE PARÉ

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 29.89 (inches Hg.) Static pressure (P_g) 0.1375 (inches w.c.)
Inside diameter: Port A 6in. Port B 6in. Tunnel cross sectional area: 0.1963Ft^2
Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)	$\sqrt{\Delta p}$
A-Centroid	3.00	0.065	105	0.2550
B-Centroid	3.00	0.0575	103	0.2398
A-1	0.40	0.060	105	0.2449
A-2	1.50	0.065	106	0.2550
A-3	4.50	0.060	105	0.2449
A-4	5.60	0.0525	94	0.2291
B-1	0.40	0.0600	105	0.2449
B-2	1.50	0.065	105	0.2550
B-3	4.50	0.060	104	0.2449
B-4	5.60	0.0525	93	0.2291
		AVERAGE	102	0.2435

Adjustment factor application

0.9843

$$V_s = K_P C_P F_P (\sqrt{\Delta_P}) AVG \sqrt{\frac{T_S}{P_s M_s}} \qquad V_s = K_p C_p (\sqrt{\Delta_p}) avg. \sqrt{\frac{T_s}{P_s M_s}}$$

Where,
C_p = pito tube coefficient = 0.84 for type S pitot
Δ_p = manometer reading (inches H_2O)
T_s = average absolute dilution tunnel temperature (°F + 460)
P_s = absolute dilution tunnel gas pressure or $P_{bar} + P_g$
P_g = static pressure $\frac{inches\ H_2O}{13.6}$

$$F_P = \frac{(\sqrt{\Delta_P}) avg}{(\sqrt{\Delta_P}) centroid}$$

Adjustment factor for alternative pitot tube placement:

M_s = 28.56, wet molecular weight of stack gas (alternatively, it may be measured)
K_p = 85.49 pitot tube constant, (conversion factor for english units)
$(\sqrt{\Delta_p}) avg.$ = average of the square roots of the velocity heads (Δ_p) measured at each traverse point.

$(\sqrt{\Delta_P}) centroid$ = average of the square roots of the velocity heads measured at the tunnel centroid (inches of H_2O)

ITS Intertek Testing Services

Date: 2001-11-21

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3009830 Run: 5 Tech: CLAUDE PARÉ

TEST DATA LOG

RAW DRY GAS METER READINGS

	System 1	System 2
Final (ft^3)	361.535	381.595
Initial (ft^3)	323.548	342.438

AMBIENT CONDITIONS

	Start	End
Barometer. (inches Hg)	29.89	29.80
Wet Bulb (°F)	58	57
Dry Bulb (°F)	78	77
Humidity (%)	28	27

ITS Intertek Testing Services

Project #: 3009830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-21 Run #: 5 Sheet # 10 of 12

Time loaded: 01:46

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
					480	79	116	641	379	293	276	177																
					427	79	110	518	389	313	288	191								74	72	75	72	72	74			
					411	79	108	525	369	324	293	201								74	73	76	73	72	76			
					412	81	106	557	367	338	303	214								74	73	77	73	73	77			
					392	81	104	499	365	351	314	223								74	73	78	73	73	78			
					379	82	103	485	373	357	322	233								74	73	78	73	73	78			
					356	82	104	455	379	362	328	247								74	73	79	73	73	79			
																				74	73	80	73	73	80			

Technician: CLAUDE PARÉ

☒ *Pre Test* ☐ *Test*

192-v-9904

INTERTEK TESTING SERVICES NA Ltd.

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-22
Run:	6
Project #:	3008830
Test Duration: (minutes)	220

RESULTS

AVERAGE ADJUSTED EMISSION RATE:	2.134
Burn Rate (Dry kg/hr):	1.020

PRESSURE FACTOR:	1.00033

TEMPERATURE FACTORS

DGM #1:	0.98676
DGM #2:	0.98792

VOLUMES SAMPLED

DGM #1:	31.61110
DGM #2:	32.28584
TOTAL TUNNEL VOLUME (scf):	33007.918

SAMPLE RATIOS

Sample Train 1:	1044.187
Sample Train 2:	1022.365

TOTAL EMISSIONS

Sample Train 1 (g):	4.3856
Sample Train 2 (g):	4.4984

EMISSION RATES

Sample Train 1 (g/hr):	1.1961
Sample Train 2 (g/hr):	1.2268

ADJUSTED EMISSION RATES

Sample Train 1 (g/hr):	2.1116
Sample Train 2 (g/hr):	2.1566
DEVIATION:	0.53%

BAROMETRIC PRESSURE

Average:	29.93
Start:	29.91
End:	29.95

DRY GAS METER VALUES

DGM #1	Final:	393.819
	Initial:	361.601
DGM #2	Final:	414.207
	Initial:	381.635

TEMPERATURES (DEG. RANKIN)

DGM #1:	535.087
DGM #2:	534.457

CALIBRATION FACTORS

DGM #1:	0.9940
DGM #2:	1.0030

TUNNEL FLOW RATE: 150.036

PARTICULATE CATCH (mg)

Sample Train 1:	4.2000
Sample Train 2:	4.4000

ITS Intertek Testing Services

Date: 2001-11-22

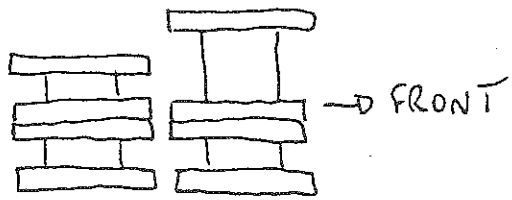
Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 300830 Run: 6 Tech: CLAUDE PARÉ

COMMENTS

00:00 START FIRE WITH KINDLING, DOOR CLOSED 5 MINUTES LATER
00:05 STIR THE FIRE, ADD PRETEST LOAD
00:18 CLOSE AIR INTAKE UP TO 1/16"
00:28 CLOSE BOOST
01:29 POKE FIRE, ADD TEST LOAD
01:31:30 CLOSE THE DOOR
01:34 CLOSE AIR INTAKE UP TO 1/16", CLOSE BOOST

TEST LOAD CONFIGURATION



192-k-9904

ITS Intertek Testing Services

Date: 2001-11-22

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 6 Tech: CLAUDE PARÉ

Moisture Meter Calibration Check:

Pre/Post Checks		
Time: ✓	12: —	22: —

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	<50 fpm	<50 fpm
Smoke Capture Check	OK	OK
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	2001-11-09	
Date Dilution Tunnel Cleaned	2001-11-09	
Induced Draft Check	<0.005	ok
Tunnel Velocity	OK	
Flow Rate 140 cfm ±10%.		150.04
Pitot Leak Check:		
Side A	ok	ok
Side B	ok	ok
Temperature System:		
Ambient (65°- 90°F)		82.70 °F
Wood Heater Surface (±125°F)		79.8 °F
Proportional Checks:		
CO Analyzer Drift Check		OK
CO_2 Analyzer Check		OK
O_2 Analyzer Check		OK
Thermocouple check		OK

Sampling Train ID Numbers:	Train 1	Train 2
Probe	1	3
Filter Front	21	23
Filter Back	22	24
Filter Thermocouple	12	15
Filter 5G-3 (<90°F)	83	82

Termocouple Identification Number

Flue 1	Room 2	Dilution Tunnel Dry Bulb 3
Dilution Tunnel Wet Bulb 4	Unit Top 5	Unit Back 6
Unit Right Side' 7	Unit Left Side 8	Unit Bottom 9
Catalyst/Combustion Chamber 10		

ITS Intertek Testing Services

Date: 2001-11-22

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3009830 Run: 6 Tech: CLAUDE PARÉ

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers

	35 SYSTEM 1 15		00 SYSTEM 2 23	
Unplugged Flow Rate = .25cfm	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5	5	5	5
Final 1minute DGM (ft^3)	361.603	393.845	381.638	414.223
Initial 1minute DGM (ft^3)	361.599	393.841	381.636	414.221
Change (C) (ft^3)	0.004	0.004	0.002	0.002
Allowable leakage .04 x Sample rate or .02cfm	0.006	0.006	0.006	0.006
Check OK	ok	ok	ok	ok

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Vacuum (inches Hg.)	5	5
Rotometer Reading (mm)	20	20
Flow Rate (CFM)	0.003	0.003
Allowable (.04 x Sample Rate)	0.006	0.006
Check OK	ok	ok

ITS Intertek Testing Services

Date: 2001-11-22

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 6 Tech: CLAUDE PABE

Pre-Test Scale Audit

Scale Type	Audit Weight		Measured Weight	
Platform	6.60	lbs, Class F	6.60	lbs
Wood	2.20	lbs, Class F	2.20	lbs
Analytical	0.1000	mg, Class S	0.1000	mg

Post-Test Scale Audit

Scale Type	Audit Weight	Measured Weight
Platform	lbs, Class F	lbs
Wood	lbs, Class F	lbs
Analytical	mg, Class S	mg

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%

ITS Intertek Testing Services

Date: 2001-11-22

Manufacturer: CHEMINÉES SÉCURITÉ Model: B15 VISTA

WHI LTO#: 3008830 Run: 6 Tech: CLAUDE PARÉ

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.00	0.00	1.68	1.69	0.52	0.49
CO_2	0.01	0.01	16.89	16.9	4.54	5.02
O_2	0.0	0.0	21.6	21.5	6.5	6.5
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.00	1.71	0.54	0.02	0.03	0.02	ok	
CO_2	0.04	16.71	4.52	0.03	0.18	0.02	ok	
O_2	0.0	21.4	6.4	0.0	0.2	0.1	ok	

- Greater than 5% of the range used.

ITS Intertek Testing Services

Date: 2001-11-22

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 6 Tech: CLAUDE PARÉ

FUEL DATA

PRE-TEST LOAD

FUEL DESCRIPTION:

Kindling weight: 3.15 lbs. Consisting of: DOUGLAS FIR Fire lit Time: 00:00

Pre-test load weight: 11.15 lbs. Consisting of: 2X4X 2:10 INCHES 5 inches Time loaded: 00:05

Pre-test moisture content: Corrected Dry: 20.9 % Wet: 17.3 %

Test Air Control Settings: CLOSED UP TO 1/16" (PIN GAUGE) Time: 00:18

Test Unit Fan Settings: FAN OFF (FAN CONFIRMATION) Time: —

TEST LOAD

	Lower Limit	Ideal	Upper Limit
Test Load Weight:	9.51 lbs.	10.57 lbs.	11.63 lbs.

Fire Box Volume:	1.51 ft.^{3}	Ideal Length:	15 5/8 inches
Load Volume:	0.221 ft.^{3}	Loading Density:	6.59 lbs/ft^3
Number of Spacers	16 ¾x1½x5	Load Density:	36.88 lbs/ft^3

Piece Size	Weight	Meter Moisture Content (% dry)*		
13 5/8 x 3½ x 1½ in.	1.68 lbs.	21.0 %	20.6 %	20.9 %
13 5/8 x 3½ x 1½ in.	1.63 lbs.	19.7 %	19.0 %	20.0 %
13 5/8 x 3½ x 1½ in.	1.43 lbs.	22.6 %	22.0 %	22.4 %
13 5/8 x 3½ x 3½ in.	3.41 lbs.	19.7 %	20.2 %	20.3 %
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%

*uncorrected range = 17.9% to 23.1%

TEST LOAD WEIGHT: 9.95 lbs **DRY WEIGHT:** 3.74 kg.

AVERAGE MOISTURE CONTENT:

CORRECTED TO TWO PIN: (DRY) 20.7 % (WET) 17.1 %

COAL BED RANGE: 1.99 lbs. to 2.49 lbs. (20% to 25% of test load)

TEST CHARGE:

Time loaded: 01:29 Coal bed weight: 2.15 lbs. Coal bed weight = 21.6 % of test load weight

CHARCOALIZATION: good|–|–|X|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|–|poor

192-o-9904

ITS Intertek Testing Services

Date: 2001-11-22

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 6 Tech: CLAUDE PARÉ

DILUTION TUNNEL PARTICULATE SAMPLER DATA

FILTER TYPE: Gelman 47mm A/E

Samples in Desiccator Date: Time:

SYSTEM 1		SYSTEM 2	
Probe and Front Half Housing # 1	Filter Numbers 21+22	Probe and Front Half Housing # 3	Filter Numbers 23+24

Post Test Weight:	56.8111 grams	0.2308 grams	53.2655 grams	0.2303 grams
Pre Test Weight:	56.8109 grams	0.2268 grams	53.2653 grams	0.2261 grams
Gain:	0.0002 grams	0.0040 grams	0.0002 grams	0.0042 grams
	a1	b1	a2	b2

Total Gain: a1 + b1 = 0.0042 grams a2 + b2 = 0.0044 grams

Pre-test Weight Record		SYSTEM 1			SYSTEM 2				
		Probe & Housing Number	Front Filter Number	Back Filter Number	Probe & Housing Number	Front Filter Number	Back Filter Number	TEMP	HUMID
Date	Time	1	21	22	3	23	24	°F	%
01-11-21	1501	56.8114	0.1102	0.1166	53.2657	0.1158	0.1104		
01-11-22	0656	56.8109	0.1102	0.1166	53.2653	0.1158	0.1103		
		Total			Total				

Post-test Weight Record		SYSTEM 1			SYSTEM 2			TEMP	HUMID
		Probe & Housing Number	Combined Filter Weight Number		Probe & Housing Number	Combined Filter Weight Number			
Date	Time	1	21	22	3	23	24	°F	%
01-11-23	7456	56.8111	0.1140	0.1168	53.2655	0.1198	0.1105		
01-11-23	1545	56.8111	0.1140	0.1168	53.2655	0.1198	0.1105		

ITS Intertek Testing Services

Date: 2001-11-22

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 6 Tech: CLAUDE PARÉ

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 29.91 (inches Hg.) Static pressure (P_g) 0,1400 (inches w.c.)

Inside diameter: Port A 6in. Port B 6in. Tunnel cross sectional area: 0.1963Ft²

Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)	$\sqrt{\Delta p}$
A-Centroid	3.00	0,0700	115	0.2646
B-Centroid	3.00	0,0625	116	0.2500
A-1	0.40	0,0675	115	0.2598
A-2	1.50	0,0750	116	0.2739
A-3	4.50	0,0625	116	0.2500
A-4	5.60	0,0550	98	0.2345
B-1	0.40	0,0650	117	0.2550
B-2	1.50	0,0725	117	0.2693
B-3	4.50	0,0625	115	0.2500
B-4	5.60	0,0625	98	0.2500
		AVERAGE	110	0.2553

Adjustment factor application

0.9923

$$V_s = K_P C_P F_P (\sqrt{\Delta_P}) AVG \sqrt{\frac{T_S}{P_S M_S}} \qquad V_s = K_p C_p (\sqrt{\Delta_p}) avg. \sqrt{\frac{T_s}{P_s M_s}}$$

Where,

C_p = pito tube coefficient = 0.84 for type S pitot

Δ_p = manometer reading (inches H_2O)

T_s = average absolute dilution tunnel temperature (°F + 460)

P_s = absolute dilution tunnel gas pressure or $P_{bar} + P_g$

P_g = static pressure $\frac{inches\ H_2O}{13.6}$

$$F_p = \frac{(\sqrt{\Delta_p})avg}{(\sqrt{\Delta_p})centroid}$$

Adjustment factor for alternative pitot tube placement:

M_s = 28.56, wet molecular weight of stack gas (alternatively, it may be measured)

K_p = 85.49 pitot tube constant, (conversion factor for english units)

$(\sqrt{\Delta_p})avg.$ = average of the square roots of the velocity heads (Δ_p) measured at each traverse point.

$(\sqrt{\Delta_p})centroid$ = average of the square roots of the velocity heads measured at the tunnel centroid (inches of H_2O)

ITS Intertek Testing Services

Date: 2001-11-22

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 6 Tech: CLAUDE PARÉ

TEST DATA LOG

RAW DRY GAS METER READINGS

	System 1	System 2
Final (ft^3)	393.819	414.207
Initial (ft^3)	361.601	381.635

AMBIENT CONDITIONS

	Start	End
Barometer. (inches Hg)	29.91	29.95
Wet Bulb (°F)	59	59
Dry Bulb (°F)	76	78
Humidity (%)	35	30

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-22 Run #: 6 Sheet # 10 of 11

Time loaded: 01:29

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
					571	80	135	740	341	277	269	155								73	72	74	72	72	74			
					472	80	121	572	372	318	301	195								73	72	75	72	72	75			
					449	80	118	556	364	330	308	220								73	73	75	73	73	76			
					456	81	117	619	357	347	319	241								74	73	76	73	73	76			
					446	83	116	605	369	370	333	258								74	73	76	73	73	77			
					444	84	117	617	382	388	349	273								74	73	77	74	73	77			
					426	84	115	544	400	402	364	289								75	74	78	74	74	78			

Technician: CLAUDE PARÉ

☒ *Pre Test* ☐ *Test*

192-v-9904

ITS Intertek Test

Project #: 3008830 Clie

Time loaded: 01:29

Sheet # 11 of 11

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Dry gas meter # 2			Tun velo	Draft	smoke
							Filter Temp	Temp Inlet	Temp outlet	Filter temp				
0	9.95	0.17	6.38	14.3	427	82	78	74	74	79	0.065	0.0575	ok
10	8.05	0.29	7.45	13.0	489	83	83	74	74	82	0.070	0.065	ok
20	6.85	0.56	7.25	12.3	469	84	81	74	74	80	0.065	0.0625	ok
30	5.65	0.62	7.79	11.7	468	84	79	74	74	78	0.060	0.0625	ok
40	4.35	0.94	9.00	10.2	487	86	78	75	74	77	0.060	0.065	ok
50	3.40	0.34	9.22	10.9	480	87	78	75	74	77	0.060	0.0625	ok
60	2.75	0.09	7.90	12.7	455	87	78	75	74	77	0.060	0.060	ok
70	2.35	0.29	5.69	14.4	417	86	78	75	74	77	0.060	0.0575	ok
80	2.05	0.32	4.99	14.6	391	86	78	75	74	77	0.060	0.055	ok
90	1.75	0.26	5.20	14.7	378	85	78	75	74	77	0.060	0.0525	ok
100	1.60	0.70	4.39	15.5	348	84	78	75	74	77	0.060	0.050	ok
110	1.50	0.81	3.90	15.6	329	83	78	75	74	78	0.060	0.0475	ok
120	1.35	0.88	3.62	15.8	316	79	78	75	74	78	0.060	0.045	ok
130	1.20	0.95	3.71	15.5	306	81	77	74	74	77	0.060	0.045	ok
140	1.05	0.99	3.68	15.5	299	81	77	74	74	77	0.060	0.0425	ok
150	0.85	1.16	3.59	15.6	294	81	77	75	74	77	0.060	0.0425	ok
160	0.75	1.12	3.61	15.6	289	81	76	75	74	76	0.060	0.0425	ok
170	0.60	1.03	3.32	16.2	279	81	76	75	74	76	0.060	0.0425	ok
180	0.45	1.07	3.24	16.1	273	81	76	75	74	76	0.060	0.040	ok
190	0.30	1.24	2.99	16.3	266	80	76	75	74	76	0.060	0.040	ok
200	0.20	1.30	2.63	16.8	258	80	75	75	75	75	0.060	0.040	ok
210	0.05	1.18	2.30	17.1	249	80	75	75	75	75	0.060	0.0375	ok
220	0.00	1.05	2.22	17.3	241	80	75	75	75	75	0.060	0.0375	ok
							75	75	75	75	0.060	0.0375	ok

Technician: CLAUDE PARÉ

INTERTEK TESTING SERVICES NA Ltd.

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-28
Run:	7
Project #:	3008830
Test Duration: (minutes)	170

RESULTS

AVERAGE ADJUSTED EMISSION RATE:	3.467
Burn Rate (Dry kg/hr):	1.344

PRESSURE FACTOR:		1.01086
TEMPERATURE FACTORS		
	DGM #1:	0.98748
	DGM #2:	0.98892
VOLUMES SAMPLED		
	DGM #1:	19.73420
	DGM #2:	20.73700
TOTAL TUNNEL VOLUME (scf):		25024.628
SAMPLE RATIOS		
	Sample Train 1:	1268.084
	Sample Train 2:	1206.762
TOTAL EMISSIONS		
Sample Train 1 (g):		5.4528
Sample Train 2 (g):		6.8785
EMISSION RATES		
Sample Train 1 (g/hr):		1.9245
Sample Train 2 (g/hr):		2.4277
ADJUSTED EMISSION RATES		
Sample Train 1 (g/hr):		3.1337
Sample Train 2 (g/hr):		3.8000
	DEVIATION:	4.81%

BAROMETRIC PRESSURE

Average:	30.245
Start:	30.23
End:	30.26

DRY GAS METER VALUES

DGM #1	Final:	413.748
	Initial:	393.859
DGM #2	Final:	435.068
	Initial:	414.386

TEMPERATURES (DEG. RANKIN)

DGM #1:	534.694
DGM #2:	533.917

CALIBRATION FACTORS

DGM #1:	0.9940
DGM #2:	1.0030

TUNNEL FLOW RATE:	147.204
PARTICULATE CATCH (mg)	
Sample Train 1:	4.3000
Sample Train 2:	5.7000

ITS Intertek Testing Services

Date: 2001-11-28

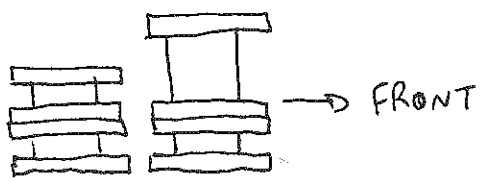
Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 7 Tech: CLAUDE PARÉ

COMMENTS

00:00 START FIRE WITH KINDLING, DOOR CLOSED 7 MINUTES LATER
00:07 STIR THE FIRE, ADD PRETEST LOAD
00:22:30 CLOSE AIR INTAKE UP TO 1/4", CLOSE BOOST
01:18 ADD 0,87 LBS OF PIECE OF WOOD
01:27 POKE FIRE, ADD TEST LOAD
01:29 CLOSE THE DOOR
01:32 CLOSE AIR INTAKE UP TO 1/4", CLOSE BOOST

TEST LOAD CONFIGURATION



192-k-9904

ITS Intertek Testing Services

Date: 2001-11-28

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 300830 Run: 7 Tech: CLAUDE PARÉ

Moisture Meter Calibration Check:

Pre/Post Checks		
Time: —	12: —	22: —

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	<50 fpm	<50 fpm
Smoke Capture Check	OK	OK
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	2001-11-09	
Date Dilution Tunnel Cleaned	2001-11-09	
Induced Draft Check	<0.005	OK
Tunnel Velocity	OK	
Flow Rate 140 cfm ±10%.		147.20
Pitot Leak Check:		
Side A	OK	OK
Side B	OK	OK
Temperature System:		
Ambient (65°- 90°F)	82.72 °F	
Wood Heater Surface (±125°F)	- 82.4 °F	
Proportional Checks:		
CO Analyzer Drift Check	OK	
CO_2 Analyzer Check	OK	
O_2 Analyzer Check	OK	
Thermocouple check	OK	

Sampling Train ID Numbers:	Train 1	Train 2
Probe	1	3
Filter Front	25	27
Filter Back	26	28
Filter Thermocouple	12	15
Filter 5G-3 (<90°F)	81	81

Termocouple Identification Number

Flue 1	Room 2	Dilution Tunnel Dry Bulb 3
Dilution Tunnel Wet Bulb 4	Unit Top 5	Unit Back 6
Unit Right Side 7	Unit Left Side 8	Unit Bottom 9
Catalyst/Combustion Chamber 10		

ITS Intertek Testing Services

Date: 2001-11-28

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 7 Tech: CLAUDE PARÉ

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers

	48 SYSTEM 1 43		09 SYSTEM 2 10	
Unplugged Flow Rate = .25cfm	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5	5	5	5
Final 1minute DGM (ft^3)	393.865	413.768	414.396	435.108
Initial 1minute DGM (ft^3)	393.863	413.767	414.391	435.103
Change (C) (ft^3)	0.002	0.001	0.005	0.005
Allowable leakage .04 x Sample rate or .02cfm	0.005	0.005	0.005	0.005
Check OK	OK	OK	OK	OK

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Vacuum (inches Hg.)	5	5
Rotometer Reading (mm)	25	25
Flow Rate (CFM)	0.003	0.003
Allowable (.04 x Sample Rate)	0.005	0.005
Check OK	OK	OK

ITS Intertek Testing Services

Date: 2001-11-28

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 7 Tech: CLAUDÉ PARÉ

Pre-Test Scale Audit

Scale Type	Audit Weight		Measured Weight	
Platform	6.60	lbs, Class F	6.60	lbs
Wood	2.20	lbs, Class F	2.20	lbs
Analytical	0.1000	mg, Class S	0.1000	mg

Post-Test Scale Audit

Scale Type	Audit Weight	Measured Weight
Platform	lbs, Class F	lbs
Wood	lbs, Class F	lbs
Analytical	mg, Class S	mg

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%

ITS Intertek Testing Services

Date: 2001-11-28

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 7 Tech: CLAUDE PARÉ

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	6.01	0.00	1.70	1.69	0.55	0.49
CO_2	0.03	0.00	16.87	16.9	4.55	5.02
O_2	0.0	0.0	21.5	21.5	6.5	6.5
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.04	1.74	0.57	0.03	0.04	0.02	OK	
CO_2	0.05	16.66	4.55	0.02	0.21	0.00	OK	
O_2	0.0	21.5	6.5	0.0	0.0	0.0	OK	

- Greater than 5% of the range used.

ITS Intertek Testing Services

Date: 2001-11-28

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 7 Tech: CLAUDE PARÉ

FUEL DATA
PRE-TEST LOAD

FUEL DESCRIPTION:
Kindling weight: 3.05 lbs. Consisting of: DOUGLAS FIR Fire lit Time: 00:00

Pre-test load weight: 11.00 lbs. Consisting of: 2X4X 5 inches (2:10 INCHES) Time loaded: 00:07

Pre-test moisture content: Corrected Dry: 21.5 % Wet: 17.7 %

Test Air Control Settings: CLOSE UP TO 1/4" Time: 00:22:30

Test Unit Fan Settings: USE WITH THERMODISC Time: —

TEST LOAD

	Lower Limit	Ideal	Upper Limit
Test Load Weight:	9.51 lbs.	10.57 lbs.	11.63 lbs.

Fire Box Volume:	1.51 ft.³	Ideal Length:	15 5/8 inches
Load Volume:	0.224 ft.³	Loading Density:	6.69 lbs/ft³
Number of Spacers	16 ¾x1½x5	Load Density:	36.07 lbs/ft³

Piece Size	Weight	Meter Moisture Content (% dry)*		
14 x3½ x1½ in.	1.77 lbs.	19.5 %	20.2 %	19.4 %
14 1/16 x3½ x1½ in.	1.75 lbs.	19.3 %	20.3 %	19.2 %
14 x3½ x 1½ in.	1.52 lbs.	22.2 %	23.0 %	20.6 %
14 x3 7/16 x3 7/16 in.	3.04 lbs.	19.8 %	19.3 %	19.9 %
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%

*uncorrected range = 17.9% to 23.1%

TEST LOAD WEIGHT: 10.10 lbs **DRY WEIGHT:** 3.81 kg.

AVERAGE MOISTURE CONTENT:
CORRECTED TO TWO PIN: (DRY) 20.4 % (WET) 16.9 %

COAL BED RANGE:
2.02 lbs. to 2.53 lbs. (20% to 25% of test load)

TEST CHARGE:
Time loaded: 01:27 Coal bed weight: 2.05 lbs. Coal bed weight = 20.3 % of test load weight

CHARCOALIZATION: good|--|--|X|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|poor

192-o-9904

ITS Intertek Testing Services

Date: 2001-11-28

Manufacturer: CHEMINÉES SÉCURITÉ Model: B15 VISTA

WHI LTO#: 3008830 Run: 7b Tech: CLAUDE PARÉ

DILUTION TUNNEL PARTICULATE SAMPLER DATA

FILTER TYPE: Gelman 47mm A/E

Samples in Desiccator Date: Time:

SYSTEM 1		SYSTEM 2	
Probe and Front Half Housing # 1	Filter Numbers 25+26	Probe and Front Half Housing # 3	Filter Numbers 27+28

Post Test Weight:	56.8099 grams	0.2299 grams	53.2651 grams	0.2329 grams
Pre Test Weight:	56.8098 grams	0.2257 grams	53.2650 grams	0.2273 grams
Gain:	0.0001 grams	0.0042 grams	0.0001 grams	0.0056 grams
	a1	b1	a2	b2

Total Gain: a1 + b1 = 0.0043 grams a2 + b2 = 0.0057 grams

Pre-test Weight Record		SYSTEM 1 Probe & Housing Number	SYSTEM 1 Front Filter Number	SYSTEM 1 Back Filter Number	SYSTEM 2 Probe & Housing Number	SYSTEM 2 Front Filter Number	SYSTEM 2 Back Filter Number	TEMP	HUMID
Date	Time	1	25	26	3	27	28	°F	%
01-11-26	7442	56.8103	0.1159	0.1099	53.2655	0.1103	0.1171		
01-11-28	7443	56.8098	0.1159	0.1098	53.2650	0.1102	0.1171		
		Total			Total				

Post-test Weight Record		SYSTEM 1 Probe & Housing Number	SYSTEM 1 Combined Filter Weight Number		SYSTEM 2 Probe & Housing Number	SYSTEM 2 Combined Filter Weight Number		TEMP	HUMID
Date	Time	1	25	26	3	27	28	°F	%
01-11-29	8428	56.8099	0.1201	0.1098	53.2651	0.1158	0.1172		
01-11-29	15431	56.8099	0.1201	0.1098	53.2651	0.1157	0.1172		

ITS Intertek Testing Services

Date: 2001-11-28

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 7 Tech: CLAUDE PARÉ

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 30.23 (inches Hg.) Static pressure (P_g) 0,1575 (inches w.c.)

Inside diameter: Port A 6in. Port B 6in. Tunnel cross sectional area: 0.1963Ft^2

Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)	$\sqrt{\Delta p}$
A-Centroid	3.00	0,0700	130	0.2646
B-Centroid	3.00	0,0675	125	0.2598
A-1	0.40	0,0675	130	0.2598
A-2	1.50	0,0750	130	0.2739
A-3	4.50	0,0650	129	0.2550
A-4	5.60	0,0550	107	0.2345
B-1	0.40	0,0700	127	0.2646
B-2	1.50	0,0750	127	0.2739
B-3	4.50	0,0675	127	0.2598
B-4	5.60	0,0525	105	0.2291
		AVERAGE	123	0.2563

Adjustment factor application

0,9776

$$V_s = K_p C_p F_p (\sqrt{\Delta_p})AVG \sqrt{\frac{T_S}{P_s M_s}} \qquad V_s = K_p C_p (\sqrt{\Delta_p})avg. \sqrt{\frac{T_s}{P_s M_s}}$$

Where,

C_p = pito tube coefficient = 0.84 for type S pitot

Δ_p = manometer reading (inches H_2O)

T_s = average absolute dilution tunnel temperature (°F + 460)

P_s = absolute dilution tunnel gas pressure or $P_{bar} + P_g$

P_g = static pressure $\frac{inches\ H_2O}{13.6}$

$$F_P = \frac{(\sqrt{\Delta_p})avg}{(\sqrt{\Delta_p})centroid}$$

Adjustment factor for alternative pitot tube placement:

M_s = 28.56, wet molecular weight of stack gas (alternatively, it may be measured)

K_p = 85.49 pitot tube constant, (conversion factor for english units)

$(\sqrt{\Delta_p})avg.$ = average of the square roots of the velocity heads (Δ_p) measured at each traverse point.

$(\sqrt{\Delta_p})centroid$ = average of the square roots of the velocity heads measured at the tunnel centroid (inches of H_2O)

ITS Intertek Testing Services

Date: 2001-11-28

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 7 Tech: CLAUDE PARÉ

TEST DATA LOG

RAW DRY GAS METER READINGS

	System 1	System 2
Final (ft^3)	413.748	435.068
Initial (ft^3)	393.859	414.386

AMBIENT CONDITIONS

	Start	End
Barometer. (inches Hg)	30.23	30.26
Wet Bulb (°F)	59	58
Dry Bulb (°F)	78	77
Humidity (%)	30	29

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-21 Run #: 5 Sheet # 11 of 17

Time loaded: 01:46

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	9.95	0.23	5.37	15.1	367	80	161	413	381	364	338	252			2.0	323.548	60	342.438	55	75	73	80	73	73	80	0.0525	0.050	ok
10	8.40	0.38	5.84	14.6	415	79	115	538	377	361	342	261			2.0	324.998	60	343.911	55	75	74	81	74	73	82	0.0575	0.0575	ok
20	7.45	0.30	5.48	14.2	401	80	110	506	367	352	333	268			2.0	326.409	60	345.353	55	75	74	79	74	73	79	0.0625	0.0575	ok
30	6.45	0.35	6.00	13.4	405	81	110	552	355	347	326	269			2.0	327.836	60	346.840	55	75	74	78	74	73	78	0.0625	0.060	ok
40	5.45	0.35	7.62	12.2	418	82	111	582	363	357	331	268			2.0	329.290	60	348.357	55	75	74	76	74	73	77	0.060	0.060	ok
50	4.30	0.67	8.80	10.7	441	84	114	645	380	373	341	268			2.0	330.755	60	349.871	55	75	74	76	74	74	77	0.060	0.0625	ok
60	3.45	0.30	8.26	11.8	436	85	113	644	390	388	353	268			2.0	332.226	60	351.366	55	75	74	77	74	74	77	0.060	0.060	ok
70	2.90	0.15	7.26	13.7	408	84	110	539	398	397	358	267			2.0	333.683	60	352.865	55	75	74	78	74	74	77	0.060	0.0575	ok
80	2.50	0.26	5.45	14.6	375	82	107	460	402	396	359	264			2.0	335.099	60	354.375	55	75	74	78	74	74	78	0.060	0.0525	ok
90	2.20	0.34	4.97	14.8	353	82	105	428	393	394	351	265			2.0	336.526	60	355.854	55	76	74	77	74	74	78	0.060	0.050	ok
100	1.90	0.33	5.02	14.6	340	81	103	424	383	389	347	265			2.0	338.009	60	357.374	55	76	74	77	74	74	78	0.060	0.0475	ok
110	1.70	0.53	4.50	15.2	317	81	101	383	374	386	339	267			2.0	339.497	60	358.914	55	76	74	77	75	74	78	0.060	0.045	ok
120	1.60	0.78	4.01	15.7	299	80	99	362	365	381	337	269			2.0	340.995	60	360.454	55	76	74	78	75	74	78	0.060	0.0425	ok
130	1.45	0.90	3.61	15.8	285	80	98	347	353	375	331	271			2.0	342.468	60	361.976	55	76	74	77	75	74	78	0.0575	0.0425	ok
140	1.30	0.99	3.55	15.9	274	79	96	335	341	365	331	273			2.0	343.929	60	363.476	55	76	74	77	75	74	78	0.0575	0.040	ok
150	1.20	1.10	3.40	15.9	265	79	95	325	336	358	329	273			2.0	345.391	60	364.987	55	76	74	76	75	74	77	0.0575	0.0375	ok
160	1.05	1.21	3.27	16.1	258	79	94	317	327	350	320	272			2.0	346.857	60	366.492	55	76	74	76	75	74	76	0.060	0.0375	ok
170	0.90	1.31	3.14	16.1	252	79	93	308	318	343	316	272			2.0	348.323	60	367.998	55	76	74	75	75	74	76	0.060	0.0375	ok
180	0.80	1.28	3.11	16.1	246	79	93	303	312	336	311	273			2.0	349.787	60	369.510	55	76	74	75	75	74	76	0.060	0.0375	ok
190	0.70	1.33	3.05	16.2	241	79	92	298	303	328	307	274			2.0	351.248	60	371.015	55	76	74	75	75	74	75	0.060	0.035	ok
200	0.55	1.44	2.91	16.3	236	79	92	296	296	322	299	274			2.0	352.715	60	372.528	55	76	74	75	75	74	75	0.060	0.035	ok
210	0.40	1.41	2.83	16.4	232	79	91	289	290	316	294	274			2.0	354.185	60	374.035	55	76	74	74	75	74	75	0.060	0.035	ok
220	0.30	1.48	2.44	16.7	226	79	90	279	282	310	291	272			2.0	355.656	60	375.548	55	76	74	74	75	74	75	0.060	0.0325	ok
230	0.20	1.56	2.07	17.0	219	78	89	269	277	302	284	270			2.0	357.124	60	377.061	55	76	75	74	75	74	75	0.060	0.0325	ok

Technician: CLAUDE LARÉ

☐ *Pre Test* ☒ *Test*

192-v-9904

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-21 Run #: 5 Sheet # 12 of 12

Time loaded: 01:46

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
240	0.15	1.60	1.98	17.0	214	78	88	261	273	295	275	268	—	—	2.0	358.590	60	378.570	55	76	75	74	75	74	75	0.060	0.0325	ok
250	0.05	1.62	1.99	17.0	210	78	88	258	267	288	267	265	—	—	2.0	360.059	60	380.084	55	76	74	74	75	74	74	0.060	0.0325	ok
260	0.00	1.44	2.00	17.3	205	78	87	247	262	282	259	264	—	—	2.0	361.535	60	381.595	55	76	74	75	75	74	75	0.060	0.030	ok

Technician: CLAUDE PARÉ

☐ *Pre Test* ☒ *Test*

192-v-9904

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-28 Run #: 7 Sheet # 11 of 11

Time loaded: 01:27

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	10.10	0.18	7.60	13.3	447	82	187	525	453	413	377	270	—	—	2.0	393.859	55	414.386	50	75	73	78	73	73	78	0.065	0.0525	ok
10	8.15	0.21	7.55	11.8	528	83	137	666	429	408	385	291	—	—	2.0	395.017	55	415.625	50	75	74	81	74	73	81	0.0625	0.070	ok
20	6.55	0.44	9.02	10.5	543	84	135	713	418	407	384	294	—	—	2.0	396.163	55	416.838	50	75	74	81	74	73	79	0.065	0.0725	ok
30	5.05	0.52	9.54	10.0	559	85	137	736	425	415	397	295	—	—	2.0	397.306	55	418.032	50	75	74	80	74	73	79	0.065	0.0725	ok
40	3.50	0.87	10.65	8.7	572	88	139	782	442	435	409	294	—	—	2.0	398.475	55	419.222	50	75	74	80	74	74	78	0.060	0.0725	ok
50	2.50	0.19	9.58	11.1	541	88	136	690	457	459	424	296	—	—	2.0	399.651	55	420.905	50	75	74	78	74	74	74	0.060	0.0675	ok
60	2.00	0.24	6.38	14.7	471	86	128	547	460	468	425	298	—	—	2.0	400.851	55	421.695	50	75	74	77	74	74	75	0.060	0.0625	OK
70	1.70	0.37	4.92	15.2	428	85	122	488	438	397	413	303	—	—	2.0	402.025	55	422.897	50	75	74	77	74	74	77	0.0575	0.0575	ok
80	1.40	0.33	4.84	14.8	406	84	119	482	413	448	400	308	—	—	2.0	403.210	55	424.103	50	76	74	78	74	74	77	0.0575	0.0575	ok
90	1.15	0.69	4.32	15.7	380	83	115	419	400	437	385	312	—	—	2.0	404.330	55	425.315	50	76	74	77	74	74	77	0.060	0.0525	ok
100	1.00	0.88	3.75	15.9	357	82	111	390	381	424	374	317	—	—	2.0	405.470	55	426.529	50	76	74	77	74	74	77	0.060	0.0525	ok
110	0.85	0.98	3.45	16.2	338	81	108	370	369	411	359	320	—	—	2.0	406.650	55	427.746	50	76	74	77	74	74	77	0.060	0.050	ok
120	0.70	1.07	3.26	16.3	324	80	106	358	349	399	352	321	—	—	2.0	407.819	55	428.964	50	75	74	77	74	74	77	0.060	0.0475	ok
130	0.50	1.13	3.21	16.2	314	80	105	350	346	388	336	322	—	—	2.0	408.998	55	430.183	50	75	74	77	74	74	77	0.060	0.045	ok
140	0.35	1.04	3.35	16.2	307	80	103	345	342	379	330	321	—	—	2.0	410.179	55	431.405	50	76	74	77	74	74	77	0.060	0.045	ok
150	0.20	1.11	3.26	16.3	300	80	102	338	340	370	323	322	—	—	2.0	411.364	55	432.624	50	76	74	77	74	74	76	0.060	0.045	ok
160	0.05	1.15	3.08	16.6	291	79	101	325	340	361	320	323	—	—	2.0	412.556	55	433.846	50	76	74	76	75	74	76	0.060	0.0425	ok
170	0.00	1.16	2.72	16.8	282	79	99	316	332	350	308	320	—	—	2.0	413.748	55	435.068	50	76	74	76	75	74	76	0.060	0.0425	OK

Technician: CLAUDÉ PARÉ

☐ *Pre Test* ☑ *Test*

192-v-9904

ITS Intertek Testing Services

Project #: 3008810 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-28 Run #: 7 Sheet # 10 of 11

Time loaded: 01:27

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
					523	75	148	580	208	171	177	94																
					530	78	136	682	288	235	217	131								74	73	73	73	72	73			
					469	77	123	556	312	282	244	165								74	73	73	73	72	73			
					505	79	127	681	339	308	261	189								74	73	74	73	73	74			
					533	81	131	727	372	332	286	199								74	73	74	73	73	74			
					534	84	132	728	405	365	321	220								74	73	75	73	73	75			
					508	84	132	622	449	400	358	255								74	73	76	73	73	76			
																				75	73	77	73	73	77			

Technician: CLAUDE LARÉ

☒ *Pre Test* ☐ *Test*

192-v-9904

INTERTEK TESTING SERVICES NA Ltd.

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-29
Run:	8
Project #:	3008830
Test Duration: (minutes)	100

RESULTS

AVERAGE ADJUSTED EMISSION RATE:	4.934
Burn Rate (Dry kg/hr):	2.285

PRESSURE FACTOR:		1.00251
TEMPERATURE FACTORS		
	DGM #1:	0.98675
	DGM #2:	0.98792
VOLUMES SAMPLED		
	DGM #1:	9.51920
	DGM #2:	10.01218
TOTAL TUNNEL VOLUME (scf):		15046.979
SAMPLE RATIOS		
	Sample Train 1:	1580.699
	Sample Train 2:	1502.867
TOTAL EMISSIONS		
Sample Train 1 (g):		5.3744
Sample Train 2 (g):		5.7109
EMISSION RATES		
Sample Train 1 (g/hr):		3.2246
Sample Train 2 (g/hr):		3.4265
ADJUSTED EMISSION RATES		
Sample Train 1 (g/hr):		4.8096
Sample Train 2 (g/hr):		5.0583
	DEVIATION:	1.26%

BAROMETRIC PRESSURE

Average:	29.995
Start:	30.03
End:	29.96

DRY GAS METER VALUES

DGM #1	Final:	423.477
	Initial:	413.796
DGM #2	Final:	445.223
	Initial:	435.144

TEMPERATURES (DEG. RANKIN)

DGM #1:	535.091
DGM #2:	534.455

CALIBRATION FACTORS

DGM #1:	0.9940
DGM #2:	1.0030

TUNNEL FLOW RATE: 150.470

PARTICULATE CATCH (mg)

Sample Train 1:	3.4000
Sample Train 2:	3.8000

ITS Intertek Testing Services

Date: 2001-11-29

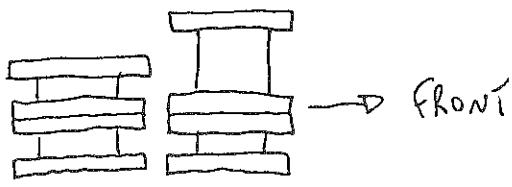
Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 8 Tech: CLAUDE PARÉ

COMMENTS

00:00 START FIRE WITH KINDLING
00:07 STIR THE FIRE, ADD PRETEST LOAD
00:08 CLOSE THE DOOR
00:13 CLOSE BOOST
00:24 ADD 2.7 LBS
00:26:30 CLOSE THE DOOR
01:35 POKE FIRE, ADD TEST LOAD, CLOSE THE DOOR

TEST LOAD CONFIGURATION



192-k-9904

ITS Intertek Testing Services

Date: 2001-11-29

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 8 Tech: CLAUDE PARÉ

Moisture Meter Calibration Check:

Pre/Post Checks		
Time: —	12: —	22: —

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	<50 fpm	<50 fpm
Smoke Capture Check	ok	ok
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	2001-11-09	
Date Dilution Tunnel Cleaned	2001-11-09	
Induced Draft Check	<0.005	ok
Tunnel Velocity	ok	
Flow Rate 140 cfm ±10%.		150.47
Pitot Leak Check:		
Side A	ok	ok
Side B	ok	ok
Temperature System:		
Ambient (65°- 90°F)		88.09 °F
Wood Heater Surface (±125°F)		-22.6 °F
Proportional Checks:		
CO Analyzer Drift Check		ok
CO_2 Analyzer Check		ok
O_2 Analyzer Check		ok
Thermocouple check		ok

Sampling Train ID Numbers:	Train 1	Train 2
Probe	4	7
Filter Front	29	31
Filter Back	30	32
Filter Thermocouple	12	15
Filter 5G-3 (<90°F)	84	82

Termocouple Identification Number

Flue 1	Room 2	Dilution Tunnel Dry Bulb 3
Dilution Tunnel Wet Bulb 4	Unit Top 5	Unit Back 6
Unit Right Side 7	Unit Left Side 8	Unit Bottom 9
Catalyst/Combustion Chamber 10		

ITS Intertek Testing Services

Date: 2001-11-29

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3009830 Run: 8 Tech: CLAUDE PARÉ

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers

	35 SYSTEM 1 51		58 SYSTEM 2 19	
Unplugged Flow Rate = .25cfm	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5	5	5	5
Final 1minute DGM (ft^3)	413.795	423.509	435.146	445.248
Initial 1minute DGM (ft^3)	413.792	423.505	435.143	445.246
Change (C) (ft^3)	0.003	0.004	0.003	0.002
Allowable leakage .04 x Sample rate or .02cfm	0.004	0.004	0.004	0.004
Check OK	OK	ok	OK	ok

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Vacuum (inches Hg.)	5	5
Rotometer Reading (mm)	15	15
Flow Rate (CFM)	0.002	0.002
Allowable (.04 x Sample Rate)	0.004	0.004
Check OK	OK	OK

ITS Intertek Testing Services

Date: 2001-11-29

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 8 Tech: CLAUDE PARÉ

Pre-Test Scale Audit

Scale Type	Audit Weight		Measured Weight	
Platform	6.60	lbs, Class F	6.60	lbs
Wood	2.20	lbs, Class F	2.20	lbs
Analytical	0.1000	mg, Class S	0.1000	mg

Post-Test Scale Audit

Scale Type	Audit Weight	Measured Weight
Platform	lbs, Class F	lbs
Wood	lbs, Class F	lbs
Analytical	mg, Class S	mg

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%

ITS Intertek Testing Services

Date: 2001-11-29

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 8 Tech: CLAUDE PARÉ

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.01	0.00	1.70	1.69	0.52	0.49
CO_2	0.03	0.00	16.83	16.9	4.50	5.02
O_2	0.0	0.0	21.5	21.5	6.4	6.5
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.00	1.64	0.51	0.01	0.06	0.01	ok	
CO_2	0.03	16.44	4.40	0.00	0.39	0.10	ok	
O_2	0.0	21.4	6.4	0.0	0.1	0.0	ok	

- Greater than 5% of the range used.

ITS Intertek Testing Services

Date: 2001-11-29

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 8 Tech: CLAUDE PARÉ

FUEL DATA
PRE-TEST LOAD

FUEL DESCRIPTION:
Kindling weight: 3.10 lbs. Consisting of: DOUGLAS FIR 2:10 Fire lit Time: 00:00

Pre-test load weight: 11.60 lbs. Consisting of: 2X4X 5 inches Time loaded: 00:07

Pre-test moisture content: Corrected Dry: 21.5 % Wet: 17.7 %

Test Air Control Settings: COMPLETELY OPENED Time: 00:00

Test Unit Fan Settings: USE WITH THERMODISC Time: —

TEST LOAD

	Lower Limit	Ideal	Upper Limit
Test Load Weight:	9.51 lbs.	10.57 lbs.	11.63 lbs.

Fire Box Volume:	1.51 ft.³	Ideal Length:	15 5/8 inches
Load Volume:	0.243 ft.³	Loading Density:	6.77 lbs/ft³
Number of Spacers	16 ¾x1½x5	Load Density:	33.37 lbs/ft³

Piece Size	Weight	Meter Moisture Content (% dry)*		
15 x 3⅛ x 1½ in.	1.56 lbs.	20.2 %	22.3 %	20.5 %
15 x 3½ x 1½ in.	1.57 lbs.	20.2 %	20.5 %	20.2 %
15 x 3½ x 1½ in.	1.70 lbs.	22.0 %	22.6 %	22.6 %
15 x 3½ x 3½ in.	3.28 lbs.	21.1 %	19.7 %	20.0 %
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%

*uncorrected range = 17.9% to 23.1%

TEST LOAD WEIGHT: 10.22 lbs DRY WEIGHT: 3.89 kg.

AVERAGE MOISTURE CONTENT:
CORRECTED TO TWO PIN: (DRY) 20.9 % (WET) 17.3 %

COAL BED RANGE:
2.04 lbs. to 2.56 lbs. (20% to 25% of test load)

TEST CHARGE:
Time loaded: 01:35 Coal bed weight: 2.55 lbs. Coal bed weight = 25.0 % of test load weight

CHARCOALIZATION: good|--|--|--|X|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|poor

ITS Intertek Testing Services

Date: 2001-11-29

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 8 Tech: CLAUDE PARÉ

DILUTION TUNNEL PARTICULATE SAMPLER DATA

FILTER TYPE: Gelman 47mm A/E

Samples in Desiccator Date: Time:

SYSTEM 1		SYSTEM 2	
Probe and Front Half Housing # 4	Filter Numbers 29 + 30	Probe and Front Half Housing # 7	Filter Numbers 31 + 32

Post Test Weight:	55.9537 grams	0.2295 grams	61.4189 grams	0.2318 grams
Pre Test Weight:	55.9531 grams	0.2267 grams	61.4187 grams	0.2282 grams
Gain:	0.0006 grams	0.0028 grams	0.0002 grams	0.0036 grams
	a1	b1	a2	b2

Total Gain: a1 + b1 = 0.0034 grams a2 + b2 = 0.0038 grams

Pre-test Weight Record		SYSTEM 1 Probe & Housing Number	SYSTEM 1 Front Filter Number	SYSTEM 1 Back Filter Number	SYSTEM 2 Probe & Housing Number	SYSTEM 2 Front Filter Number	SYSTEM 2 Back Filter Number	TEMP	HUMID
Date	Time	4	29	30	7	31	32	°F	%
01-11-28	15h40	55.9535	0.1162	0.1106	61.4188	0.1098	0.1184		
01-11-29	8h28	55.9531	0.1161	0.1106	61.4187	0.1098	0.1184		
		Total			Total				

Post-test Weight Record		SYSTEM 1 Probe & Housing Number	SYSTEM 1 Combined Filter Weight Number		SYSTEM 2 Probe & Housing Number	SYSTEM 2 Combined Filter Weight Number		TEMP	HUMID
Date	Time	4	29	30	7	31	32	°F	%
01-11-30	8h10	55.9538	0.1187	0.1108	61.4189	0.1134	0.1184		
01-11-30	11h49	55.9537	0.1187	0.1108	61.4189	0.1134	0.1184		

ITS Intertek Testing Services

Date: 2001-11-29

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 8 Tech: CLAUDE PARÉ

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 30.03 (inches Hg.) Static pressure (P_g) 0,1800 (inches w.c.)
Inside diameter: Port A 6in. Port B 6in. Tunnel cross sectional area: 0.1963Ft^2
Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)	$\sqrt{\Delta p}$
A-Centroid	3.00	0,0800	158	0.2828
B-Centroid	3.00	0,0775	153	0.2784
A-1	0.40	0,0825	156	0.2872
A-2	1.50	0,0875	158	0.2958
A-3	4.50	0,0750	160	0.2739
A-4	5.60	0,0750	117	0.2739
B-1	0.40	0,0850	154	0.2915
B-2	1.50	0,0875	156	0.2958
B-3	4.50	0,0850	155	0.2915
B-4	5.60	0,0650	112	0.2550
		AVERAGE	145	0.2831

Adjustment factor application 1.0088

$$V_s = K_p C_p F_p (\sqrt{\Delta_p})AVG \sqrt{\frac{T_S}{P_s M_s}} \qquad V_s = K_p C_p (\sqrt{\Delta_p})avg. \sqrt{\frac{T_s}{P_s M_s}}$$

Where,
C_p = pito tube coefficient = 0.84 for type S pitot
Δ_p = manometer reading (inches H_2O)
T_s = average absolute dilution tunnel temperature (°F + 460)
P_s = absolute dilution tunnel gas pressure or $P_{bar} + P_g$
P_g = static pressure $\frac{inches\ H_2O}{13.6}$

$$F_P = \frac{(\sqrt{\Delta_p})avg}{(\sqrt{\Delta_p})centroid}$$

Adjustment factor for alternative pitot tube placement:

M_s = 28.56, wet molecular weight of stack gas (alternatively, it may be measured)
K_p = 85.49 pitot tube constant, (conversion factor for english units)
$(\sqrt{\Delta_p})avg.$ = average of the square roots of the velocity heads (Δ_p) measured at each traverse point.

$(\sqrt{\Delta_p})centroid$ = average of the square roots of the velocity heads measured at the tunnel centroid (inches of H_2O)

ITS Intertek Testing Services

Date: 2001-11-29

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run: 8 Tech: CLAUDE PARÉ

TEST DATA LOG

RAW DRY GAS METER READINGS

	System 1	System 2
Final (ft^3)	423.477	445.223
Initial (ft^3)	413.796	435.144

AMBIENT CONDITIONS

	Start	End
Barometer. (inches Hg)	30.03	29.96
Wet Bulb (°F)	58	59
Dry Bulb (°F)	78	81
Humidity (%)	28	25

ITS Intertek Test

Project #: 3008830 Clie

Sheet # 11 of 11

Time loaded: 01:35

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Dry gas meter # 2			Tun velo	Draft	smoke
							Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	10.15	0.11	6.91	13.5	555	87						
10	7.95	0.12	8.79	9.8	715	88	80	74	74	80	0.065	0.0825	ok
20	5.85	0.09	9.77	10.1	737	90	82	74	74	82	0.065	0.0825	ok
30	3.90	0.15	9.81	9.5	763	90	83	74	74	81	0.065	0.0825	ok
40	2.35	0.13	10.33	9.7	754	89	83	74	74	80	0.065	0.0825	ok
50	1.55	0.13	7.41	13.6	644	89	84	75	74	79	0.065	0.0825	ok
60	1.05	0.20	5.33	14.4	579	89	84	75	74	77	0.065	0.0725	ok
70	0.60	0.24	5.04	14.7	542	88	84	75	74	78	0.065	0.070	ok
80	0.35	0.55	4.37	15.5	497	87	83	75	74	80	0.065	0.0675	ok
90	0.10	0.69	3.87	15.7	468	86	82	75	75	80	0.065	0.0625	ok
100	0.00	0.77	3.59	16.1	442	86	82	75	75	81	0.0625	0.0625	ok
							82	75	75	82	0.0625	0.060	ok

Technician: CLAUDE PARÉ

192-v-9904

ITS Intertek Testing Services

Project #: 3008830 Client: CHEMINÉES SÉCURITÉ Date: 2001-11-29 Run #: 8 Sheet # 10 of 11

Time loaded: 01:35

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
					397	76	171	383	222	194	206	143								74	73	73	73	73	73			
					441	76	127	504	241	220	229	176								74	73	74	73	73	74			
					545	78	137	670	276	240	249	201								75	73	74	73	77	74			
					625	80	150	757	329	267	271	212								74	73	75	73	73	75			
					691	84	163	788	383	324	327	230								75	74	76	93	73	76			
					714	88	171	822	437	387	382	250								75	74	77	74	73	77			
					665	89	166	741	446	428	418	276								75	74	79	74	74	79			

Technician: CLAUDE LALÉ

☒ *Pre Test* ☐ *Test*

192-v-9904

APPENDIX B
Laboratory Operating Procedures

SFBA EMISSIONS AND EFFICIENCY TESTING
LABORATORY OPERATING PROCEDURE

INTRODUCTION

This document provides a step by step guide for the technician conducting tests to Oregon and/or EPA standard requirements. Procedures outlined here, when followed, will result in tests in conformance with Oregon Department of Environmental Quality Method Om42 and EPA Methods 28 and 5G.

The primary measurements to be made are particulate emissions rates. The technician's duties include the following steps.

1. Incoming inspection of test units.
2. Set-up of test units.
3. Preliminary testing to establish unit operating procedures and familiarity with operating controls.
4. Calibration of test equipment.
5. Set-up, checking and operation of sampling apparatus.
6. Conduct of tests including complete record keeping and data recording for non-automated functions.
7. Operation of hardware and software included in automatic data acquisition system.
8. Review and analysis of data at test completion to ensure test validity.

The technician running this test must be familiar with the following documents, which are to be kept in the laboratory at all, times.

EPA METHODS

a. Method 28
b. Method 28a
c. Method 5G

Test forms are provided for all collected data and calibration records are found in appendix for each instrument.

I. APPLIANCE INSPECTION AND SET-UP

A. INCOMING INSPECTION

1. Check for completeness of unit including parts, accessories, installation and operating instructions, drawings and specifications etc. Note any discrepancies or missing parts or information.
2. Check for shipping damage. If damage has occurred, notify the laboratory manager. In some cases, repairs may be made, provided the manufacturer and laboratory manager concur that repairs will not affect the unit's performance. If damage is irrepairable, a new unit will need to be obtained.
3. Note whether unit is catalytic of non-catalytic.
4. Mark unit with manufacturer's name, model number, work order number and date received.
5. If unit is safety listed, note label data including listing agency and serial number. If unit is not listed, mark all data sheets "UNLISTED". Test results will not be released until unit passes safety tests without modification unless authorized by laboratory manager.

B. UNIT SET-UP

1. All new units must be operated for a breaking in period as follows.

    a) Non-catalytic units: Ten (10) hours at medium burn rate with Douglas Fir scrap or cordwood.
    b) Catalytic units: Fifty (50) hours at medium burn rate with Douglas Fir scrap or cordwood.

    During these break-in runs the unit may be connected to a lab chimney and fuel additions noted on data form no. 192-ai-9904. For catalytic units, a thermocouple must be installed in the catalyst.

    Record catalyst temperature at 1-hour intervals or on chart recorder. Operating should continue until data shows at least fifty (50) hours of operation with catalyst temperature in excess of 800 degrees Fahrenheit (active range).

    For non-catalytic units a stack thermocouple should be installed and stack temperature recorded at 1-hour intervals. Ten (10) hours minimum burn time with a stack temperature of at least 250 degrees Fahrenheit is required.

2. Once break-in is completed, allow unit to cool. Clean unit thoroughly.

3. Unit is to be placed on scale for testing. Prior to proceeding with verification process, scale should be turned on and allowed to warm up for one (1) hour minimum. Zero scale and check calibration with standard weights. One (1) 1 kg weight and one (1) 2 kg weight are provided for this purpose. Use scale verification test form no. 192-m-9904 to record results. If scale fails to reproduce weights within tolerance, check with laboratory manager before proceeding.
4. If scale checks out, place unit on scale and align so chimney will be centered in hood. Note unit weight on form no. 192-af-9904.
5. Attach chimney connector and chimney. Be sure all joints are sealed below sampling points. Chimney and connector should be cleaned with a wire brush. Be sure chimney connector terminates and chimney starts at proper level above scale platform. Chimney must be supported from scale so that it does not touch test enclosure or hood walls.
6. Thermocouples should be attached to surfaces of unit prior to testing. EPA requires a thermocouple on the bottom of the firebox. This must be installed prior to putting the unit on the scale. In some cases, the required thermocouple locations will be inaccessible on finished units. These units should have thermocouples installed by the manufacturer during construction. Check with the laboratory manager if problems are encountered in proper thermocouple attachment.
7. Measure firebox dimensions and record on data form nos. 192-ar-9905 and 192-aq-9905. Make a three dimensional sketch of the firebox including firebrick, baffles and obstructions. Calculate firebox volume in cubic feet. See Section 6.2.4 of EPA Method 28 for details of firebox volume determination.
8. If unit is catalytically equipped, additional thermocouples must be installed upstream and downstream of catalyst. Thermocouples should also be placed in the primary and secondary combustion chambers of all units.
9. Plug thermocouples into data acquisition system jacks making a record of locations and jack numbers for each test on data form no. 192-ah-9904.
10. Note that inserts are tested as if they are freestanding stoves.
11. Dilution tunnel should be cleaned prior to each certification test series and at anytime a higher burn rate follows a lower test burn rate.

II. SAMPLING SYSTEM – SET-UP

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)

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.
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.

III. 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.

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.

   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.

IV. POST TEST PROCEDURES

A. 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.

B. 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.

C. 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 C
Sampling Proportionality Results

(EPA Formulas from PR5G)

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-12
Run:	1

PR1	PR2	#1 dDGM Vol.Std. (ft3)	#2 dDGM Vol.Std. (ft3)	Time
				0
100.72	100.36	1.429	1.451	10
97.20	96.90	1.416	1.439	20
99.70	101.39	1.423	1.475	30
99.80	101.84	1.422	1.479	40
94.71	86.58	1.376	1.282	50
100.54	101.76	1.437	1.483	60
100.83	97.42	1.445	1.424	70
101.66	100.43	1.431	1.442	80
102.18	99.20	1.441	1.427	90
99.94	96.75	1.441	1.423	100
97.89	93.71	1.442	1.407	110
99.65	98.79	1.442	1.458	120
97.77	99.67	1.447	1.504	130
99.25	101.46	1.443	1.504	140
99.50	100.36	1.448	1.489	150
99.41	98.98	1.448	1.470	160
105.82	96.59	1.511	1.406	170
93.86	103.66	1.369	1.542	180
99.52	101.57	1.424	1.482	190
100.28	101.23	1.435	1.477	200
100.19	101.27	1.435	1.479	210
98.10	99.83	1.434	1.488	220
100.31	101.53	1.438	1.484	230
100.24	101.18	1.437	1.479	240
100.36	101.71	1.440	1.488	250
100.22	101.57	1.438	1.486	260
100.20	101.13	1.439	1.481	270
100.27	101.61	1.440	1.488	280
100.33	101.82	1.441	1.491	290

(EPA Formulas from PR5G)

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-13
Run:	2

PR1	PR2	#1 dDGM Vol.Std. (ft3)	#2 dDGM Vol.Std. (ft3)	Time
				0
98.21	97.45	1.310	1.230	10
100.30	99.82	1.378	1.297	20
99.81	99.37	1.378	1.298	30
98.58	98.63	1.366	1.293	40
98.81	98.26	1.374	1.293	50
102.23	102.49	1.368	1.297	60
101.38	100.80	1.359	1.278	70
100.34	100.57	1.345	1.275	80
97.88	98.35	1.312	1.247	90
97.57	103.16	1.309	1.309	100
97.20	104.66	1.304	1.328	110
99.57	101.58	1.335	1.289	120
100.68	99.92	1.350	1.268	130
100.77	100.41	1.350	1.273	140
100.38	99.52	1.346	1.263	150
100.01	100.00	1.341	1.269	160
100.38	99.84	1.346	1.267	170
100.38	99.29	1.346	1.260	180
100.23	99.76	1.344	1.266	190
99.79	99.37	1.338	1.261	200
99.70	99.04	1.338	1.258	210
99.55	99.34	1.336	1.262	220
99.84	99.51	1.340	1.264	230
99.90	99.18	1.342	1.261	240
100.20	99.42	1.346	1.264	250
99.83	99.74	1.341	1.268	260
99.97	99.26	1.343	1.262	270
99.96	99.72	1.344	1.269	280
99.96	99.72	1.344	1.269	290
100.55	99.41	1.352	1.265	300
100.10	100.10	1.346	1.274	310
99.86	99.40	1.344	1.266	320
100.23	99.71	1.349	1.270	330
100.29	99.86	1.351	1.273	340
100.14	99.38	1.349	1.267	350
100.14	100.25	1.349	1.278	360
97.62	96.93	1.317	1.237	370
99.97	99.13	1.348	1.265	380

(EPA Formulas from PR5G)

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-14
Run:	3

PR1	PR2	#1 dDGM Vol.Std. (ft3)	#2 dDGM Vol.Std. (ft3)	Time
				0
101.57	100.26	1.429	1.443	10
99.19	98.25	1.410	1.429	20
99.97	99.56	1.429	1.456	30
100.08	100.38	1.435	1.472	40
99.63	99.97	1.431	1.469	50
98.56	99.18	1.418	1.460	60
96.98	97.42	1.395	1.434	70
97.23	95.97	1.428	1.442	80
94.90	92.51	1.395	1.391	90
99.61	99.20	1.436	1.463	100
98.01	98.07	1.440	1.475	110
101.57	101.04	1.434	1.460	120
101.36	100.90	1.431	1.458	130
100.87	100.49	1.424	1.452	140
100.59	99.87	1.420	1.443	150
100.17	98.42	1.415	1.422	160
99.48	97.60	1.405	1.410	170
99.76	102.28	1.409	1.478	180
99.55	103.72	1.406	1.499	190
99.62	102.80	1.407	1.485	200
99.13	102.25	1.400	1.477	210
99.13	102.07	1.400	1.475	220
102.31	105.06	1.416	1.487	230
102.09	100.00	1.413	1.416	240
99.87	96.96	1.412	1.402	250
99.99	97.12	1.415	1.406	260

(EPA Formulas from PR5G)

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-20
Run:	4

PR1	PR2	#1 dDGM Vol.Std. (ft3)	#2 dDGM Vol.Std. (ft3)	Time
				0
105.00	100.29	2.037	1.464	10
98.60	99.84	1.923	1.465	20
99.16	95.45	1.936	1.402	30
100.71	98.01	1.921	1.406	40
99.72	99.17	1.940	1.451	50
99.03	99.42	1.928	1.456	60
97.59	97.87	1.907	1.438	70
105.63	104.09	1.983	1.470	80
101.35	101.19	1.906	1.431	90
100.21	100.30	1.889	1.423	100
99.46	100.47	1.879	1.427	110
99.44	100.40	1.882	1.429	120
99.41	100.36	1.885	1.431	130
99.55	100.58	1.887	1.434	140
99.59	100.42	1.893	1.436	150
99.05	100.10	1.884	1.432	160
99.36	100.17	1.890	1.433	170
99.27	100.01	1.890	1.432	180
98.97	99.80	1.885	1.429	190
99.38	99.87	1.892	1.430	200
96.70	97.59	1.885	1.430	210
99.34	100.12	1.893	1.435	220
96.65	97.79	1.884	1.433	230

(EPA Formulas from PR5G)

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-21
Run:	5

PR1	PR2	#1 dDGM Vol.Std. (ft3)	#2 dDGM Vol.Std. (ft3)	Time
				0
102.22	100.80	1.420	1.458	10
94.99	94.24	1.382	1.428	20
96.07	97.18	1.398	1.472	30
99.99	101.28	1.424	1.502	40
101.02	101.25	1.435	1.498	50
101.34	99.89	1.441	1.479	60
100.11	99.89	1.427	1.483	70
97.04	100.36	1.387	1.494	80
97.53	98.13	1.396	1.463	90
101.18	100.67	1.451	1.504	100
101.34	101.72	1.456	1.522	110
101.84	101.54	1.466	1.522	120
102.20	102.42	1.441	1.504	130
101.19	100.75	1.430	1.482	140
101.16	101.40	1.431	1.493	150
99.22	98.78	1.434	1.487	160
99.13	98.76	1.434	1.488	170
98.99	99.15	1.432	1.494	180
98.70	98.60	1.430	1.487	190
99.10	99.13	1.435	1.495	200
99.22	98.65	1.438	1.489	210
99.19	98.95	1.439	1.495	220
98.81	98.86	1.435	1.495	230
98.58	98.51	1.433	1.491	240
98.88	98.83	1.437	1.496	250
99.26	98.55	1.444	1.493	260

(EPA Formulas from PR5G)

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-22
Run:	6

PR1	PR2	#1 dDGM Vol.Std. (ft3)	#2 dDGM Vol.Std. (ft3)	Time
				0
94.47	92.59	1.434	1.435	10
95.95	96.01	1.409	1.440	20
98.74	99.91	1.395	1.441	30
101.19	99.51	1.427	1.433	40
99.78	100.18	1.408	1.444	50
101.53	102.05	1.437	1.475	60
100.63	102.93	1.429	1.493	70
100.76	101.41	1.436	1.476	80
101.00	100.83	1.441	1.470	90
100.53	100.16	1.439	1.464	100
100.12	100.39	1.435	1.470	110
100.50	100.46	1.446	1.476	120
100.91	100.19	1.452	1.472	130
100.39	100.55	1.445	1.479	140
100.07	100.26	1.442	1.476	150
100.32	99.90	1.447	1.472	160
100.36	100.42	1.449	1.481	170
100.02	100.08	1.444	1.476	180
100.07	100.30	1.446	1.480	190
100.52	99.67	1.454	1.472	200
100.09	99.92	1.449	1.477	210
99.71	100.10	1.445	1.481	220

(EPA Formulas from PR5G)

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-28
Run:	7

PR1	PR2	#1 dDGM Vol.Std. (ft3)	#2 dDGM Vol.Std. (ft3)	Time
				0
98.85	101.75	1.149	1.243	10
95.76	97.52	1.137	1.217	20
95.67	96.15	1.134	1.198	30
102.02	99.82	1.160	1.193	40
102.37	107.35	1.167	1.286	50
103.75	98.90	1.191	1.193	60
103.16	101.52	1.165	1.205	70
103.76	101.59	1.175	1.209	80
95.67	99.60	1.111	1.215	90
97.04	99.42	1.130	1.217	100
100.18	99.40	1.170	1.220	110
99.17	99.31	1.160	1.221	120
99.93	99.30	1.170	1.222	130
99.82	99.37	1.171	1.225	140
100.07	99.04	1.175	1.222	150
100.57	99.10	1.182	1.224	160
100.40	98.93	1.182	1.224	170

(EPA Formulas from PR5G)

Manufacturer:	Chem. Sec.
Model:	Bis Vista
Date:	2001-11-29
Run:	8

PR1	PR2	#1 dDGM Vol.Std. (ft3)	#2 dDGM Vol.Std. (ft3)	Time
				0
98.84	98.71	0.933	0.980	10
99.41	98.36	0.937	0.975	20
99.13	100.80	0.932	0.997	30
99.50	103.36	0.937	1.024	40
100.52	101.57	0.959	1.019	50
100.03	98.11	0.962	0.992	60
99.66	97.74	0.964	0.994	70
98.60	95.94	0.960	0.982	80
100.92	101.44	0.966	1.021	90
100.70	101.41	0.968	1.025	100

APPENDIX D
Calibration Data

EQUIPMENT LIST

and

CALIBRATION MATRIX

NO. EQUIP.	EQUIPMENT	FREQUENCY	AGENCY
180-220	Sling psychrometer	none (mercury type)	n/a
180-169	Gas Analyzer	each test (initial and final)	ITS
180-265	Calibration gases	on purchase	Air Liquide
180-156	Draft Indicator	annual	Chevrier
180-293/294	Vacuum gauges	annual	Chevrier
180-291/292	Pressure gauges	annual	Chevrier
180-221	Reference Dry Gas Meter	annual	Canadian Meter
180-175/176	Dry Gas Meter (metering system)	semi-annual and each series	ITS
180-184	Pitot type "S"	semi-annual	ITS
180-290	Pitot type "S"	semi-annual	ITS
180-222	Hot Wire Anemometer	semi-annual	ITS
180-170	Analytical scale	semi-annual	ITS and Mettler/Toledo
180-280	Scale 0-8000 gr.	annual	Mettler/Toledo
180-129/130	Readout for 1000 lbs scale	annual	Mettler/Toledo
180-110/195/266	Calibration weights	5 years	Marconi
180-219	Moisture meter	each series	ITS
180-223	Calibrator t/c	annual	Primo
180-231/230	Temperature recorder	semi-annual	ITS

DRAFT GAUGE

La Cie f.
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Fax: (514) 327-0604
www.chevrierinstruments.com
info@chevrierinstruments.com
ISO 9002

Certificat d'étalonnage-Pression Différentielle
Calibration Certificate-Differentiel Pressure

Description	Manomètre Différentiel Magnehelic Dwyer modèle 2000-00	*Numéro de série / Serial number*	
Plage / Range	0/0.25 "H_2O	*Identification*	180/156
Précision / Accuracy	±4% P.É.	*Reçu conforme / Received in specs*	Oui
Client / Customer	ITS SERVICES D'ESSAIS INTERTEK 1802	*Quitte conforme / Leaving in specs*	Oui
Bon de travail / Work order #	3673-05	*Réparation (o/n) / Repaired (y/n)*	Non
Conditions d'étalonnage à l'ambiante / Ambient conditions at time of calibration	24°C	42%HR	30.28 poHg

Remarque(s)
Comments

Appliquée / Applied "H_2O	Lectures / Readings (ascendantes) (ascending)	Erreur / Error	Lectures / Readings (descendantes) (descending)	Erreur / Error
0,0000	0,000	0,0000	0,000	0,0000
0,0592	0,055	-0,0042	0,055	-0,0042
0,1191	0,115	-0,0041	0,115	-0,0041
0,1805	0,185	0,0045	0,185	0,0045
0,2490	0,255	0,0060	0,255	0,0060

L'instrument ci-haut mentionné a été étalonné selon la méthode de comparaison en conformité avec ANSI B40.1-1985
The above instrument was calibrated using the comparison method in conformance with ANSI B40.1-1985
Étalons utilisés retraçable au C.N.R.C / N.I.S.T.– Standards used C.N.R.C / N.I.S.T. Traceable

CHEV029, Simulateur/manomètre numérique différentiel Furness Controls, modèle PPC500, n/s 960294, certificat #FC100-145-02 référence au NIST. Date due 24 mai 2001.
CHEV029, Differential pressure calibrator PPC500 from Furness Controls S/N 960294, NIST traceable certificate #FC100-145-02. Due date May 24th, 2001.

Certifié par / Certified by: Benoit Lamber
Date: 2000/11/06
Date due / Due Date: 2001/11/06
Numéro du certificat / Certificate number: 3673-05-1802

C.R.
B.L.

Version 1, revision 000320
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PITOT TUBE
TYPE "S"

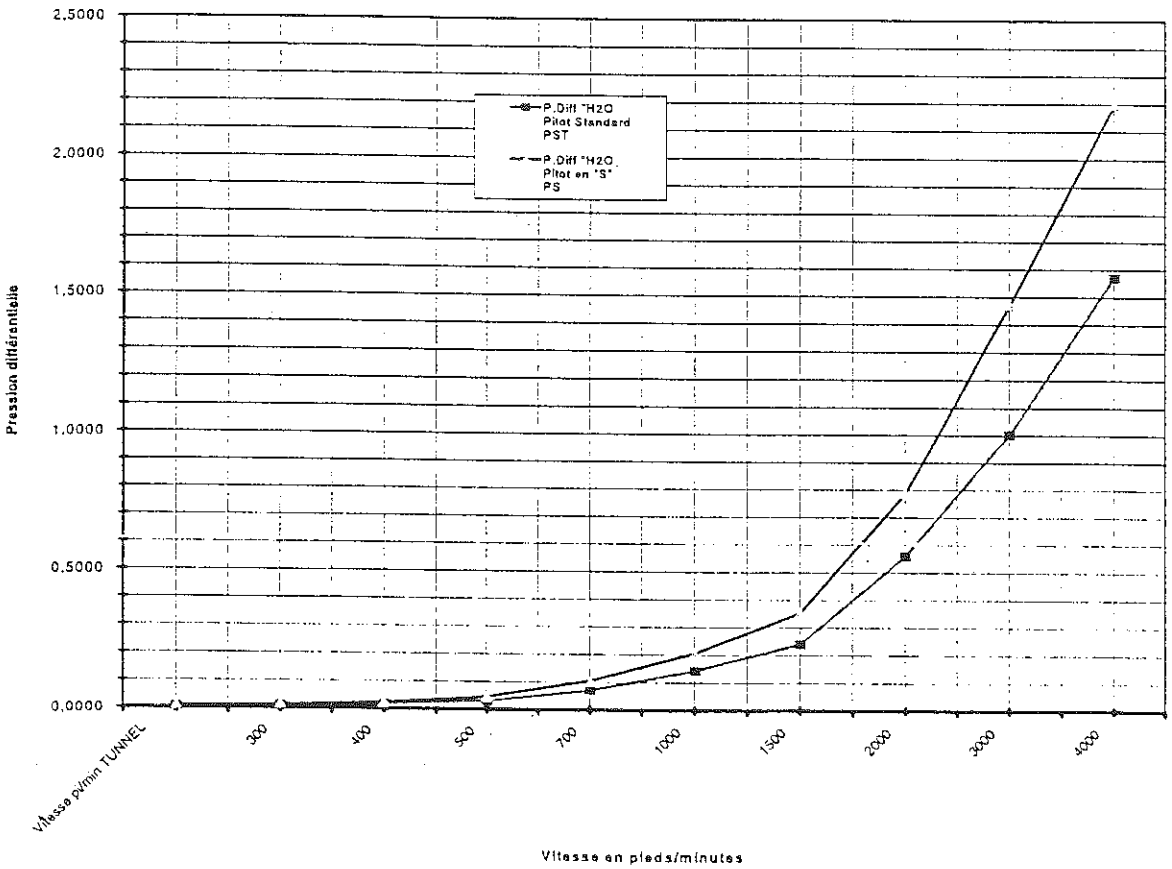
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Fax (514) 327-0604
ISO 9002

Certificat d'étalonnage pour Tube de Pitot en 'S'
Calibration Certificate for 'S' Pitot Tube

Description	Tube de Pitot en «S»	*Identification*	010611-05
Longueur	18 Po	*Reçu conforme Received in specs*	Oui
Client / Customer	ITS Services D'essais Intertek AN Ltée 1802	*Quitte conforme Leaving in specs*	Oui
Bon de travail Work order #	64491-01	*Réparation (o/n) Repaired (y/n)*	Non
Conditions d'étalonnage à l'ambiante Ambient conditions at time of calibration	21.6°C	39%HR	29.44poHg

Remarque(s)
Comments

Courbe d'étalonnage



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Température deg C	21,3	Humidité Relative %	54
Pression Atm. Pa	101800	Facteur K	**1,000**

Vitesse pi/min TUNNEL	P.Diff "H_2O Pitot Standard PST	vitesse calculée PST	P.Diff "H_2O Pitot en "S" PS	Facteur (racine carrée du ratio PST/PS)
300	0,0051	286	**0,0076**	0,8192
400	0,0099	398	**0,0137**	0,8501
500	0,0153	495	**0,0229**	0,8174
700	0,0296	689	**0,0452**	0,8092
1000	0,0704	1063	**0,1048**	0,8196
1500	0,1427	1513	**0,2054**	0,8335
2000	0,2402	1963	**0,3545**	0,8231
3000	0,5593	2995	**0,7870**	0,8430
4000	1,0017	4008	**1,4693**	0,8257
5000	1,5706	5019	**2,1974**	0,8454

L'instrument ci-haut mentionné a été étalonné selon la méthode de comparaison en conformité avec
The above instrument was calibrated using the comparison method in conformance with
Mode d'étalonnage CHEV031 Tuyère de calibration Airflow Developments type 83 FSL #VM7154670 et plaques orifices étalonnées. Différentiel de pression mesuré avec manomètre incliné type 4/5 de Airflow Developments n/s 45150, précision ±0.3% v.m., certifié NIST #CHEV.032, date due octobre 2002. Tube de Pitot Airflow #VAA7251001, F.C. .997, et simulateur/manomètre numérique différentiel de Furness Controls, modèle PPC500, n/s 960294, certificat FC101-010-02 référencé au NIST, date due 10 juillet 2001.

Certifié par / Certified by: Benoit Lambert

Date: 2001/06/13

Date due / Due Date: 2002/06/13

Numéro du certificat / Certificate number: 64491-05-1802

HOT WIRE ANEMOMETER

CHEVRIER INSTRUMENTS INC.
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info@chevrierinstruments.com
ISO 9002

Certificat d'étalonnage-Vélocité
Calibration Certificate-Velocity

Description	Thermo-anémomètre Oméga (Kane May) HHF51	*Numéro de série / Serial number*	34362/1
Plage / Range	10/6000 pi/min	*Identification*	180/222
Précision / Accuracy	±3% V.M. ou ±1% P.É.	*Reçu conforme / Received in specs*	Non
Client / Customer	ITS Services d'essais Intertek 1802	*Quitte conforme / Leaving in specs*	Oui
Bon de travail / Work order #	3673-09	*Réparation (o/n) / Repaired (y/n)*	Non
Conditions d'étalonnage à l'ambiante / Ambient conditions at time of calibration	21.0°C	42%HR	30.20poHg

Remarque(s)
Comments

Appliquée / Applied pi/min	Lectures Avant / Before Readings	Lectures Après / After Readings	Erreur / Error
100	150	160	60
1500	1460	1560	60
3000	2770	2960	-40
4500	4090	4370	-130
5000	4730	5050	50

Mode d'étalonnage CHEV031 Tuyère de calibration Airflow Developments type 83 FSL #VM7154670 et plaques orifices étalonnées. Différentiel de pression mesuré avec manomètre incliné type 4/5 de Airflow Developments n/s 45150, précision ±0.3% v.m., certifié NIST #991012CHEV.032, date due 12 octobre 2000. Tube de Pitot Airflow #VAA7251001, F.C. .997, et simulateur/manomètre numérique différentiel de Furness Controls, modèle PPC500, n/s 960294, certificat FCI99-126-01 référencé au NIST, date due 24 mai 2001.

Calibration CHEV031 Airflow Developments Calibration Tunnel, type 83 FSL #VM7154670 with orifice plates. Differential pressure measured with an inclined manometer type 4/5 from Airflow Developments s/n 45150 NIST certified #991012CHEV.032, due date October 12th, 2000. Airflow Pitot Tube #VAA7251001, C.F. .997, and simulator/digital differential pressure gauge from Furness Controls, model PPC500, s/n 960294, certificate FCI99-126-01, traceable to NIST, calibration due May 24th 2001.

Certifié par / Certified by: Marc-André Gilbert

Date: 2000/11/06

Date due / Due Date: 2001/11/06

Numéro du certificat / Certificate number: 3673-09-1802

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ANALYTICAL SCALE

METTLER-TOLEDO INC.

FEUILLE DE TRAVAIL D'ÉTALONNAGE

CLIENT: I.T.S. Intertech Adresse: 1829 32ième Lac.Line

[X] Inspection régulière [ ] Inspection Intérimaire Rapport (C.S.A.)#: 407488

balance: [ ] location: [ ]

fabricant: Ohaus [ ] modèle: A310S # série: 1115C114?

capacité: 300gr graduation: .0001gr tolérance en service: 1%

(selon la norme SOR/DORS 74/413 de Poids & Mesures Canada)

[X] 25% capacité [ ] 25% [ ] 50% [ ] 75% [X] 100%

[ ] poids autres [ ] [ ] [ ] [ ]

Poids utilisés [ ] lbs [ ] kg [X] g Résultats d'essais [ ] lbs [ ] kg [X] g

TEST DE COINS

2 Lecture	4 Lecture
100gr	100gr
Ajustement NON	Ajustement NON
Final 100.0002	Final 100gr
1 Lecture	**3 Lecture**
100gr	100g
Ajustement NON	Ajustement NON
Final 99.9999	Final 99.9999

	25% cap.	50% cap.	75% cap.	100%
Poids stand.	100gr	200gr	300gr	
Lecture	100.0016	200.0026	300.0050	
Ajust.	Oui Non	Oui Non	Oui Non	Oui Non
Final	100.0002	200.0003	300.0005	

Les résultats des essais sont en KG ou en LBS

1 KG = 2.2046 lbs 1 LB = 0.4535 kg

Les poids certifiés utilisés pour la calibration des balances sont calibrés et certifiés par Poids & Mesure Canada selon la norme SOR/90/118 Section I II III

** NOTE: Le total des poids certifiés utilisés dépend de la capacité de la balance et des restrictions physiques à l'application des poids certifiés. Les poids utilisés pour bâtir la charge de la balance seront considérés comme autres.

Poids certifiés utilisés #: K.T Certificat #: ME8130.71 Étalonnage dû: Janvier 2002

Poids certifiés utilisés #: Certificat #: Étalonnage dû:

Signature du technicien: Date: 08 Août 2001

Nom du technicien: Bernard Lefebvre (en lettres moulées s.v.p.) DATE PROCHAINE INSPECTION: Juillet 2002

METTLER-TOLEDO INC.

Remarques:

Ce formulaire complété doit être conservé par le contremaître pendant deux ans.
Le certificat des poids certifiés est répertorié aux Normes canadiennes à Ottawa, au Centre National de Recherche.

PROUVÉ: STA5438F/ISO DATE D'ÉMISSION: 27 octobre 1995

SIGNATURE: Serge Gougeon COPIE CONTRÔLÉE: Mettler-Toledo Inc.

POUR SERVICE SUPPLEMENTAIRE LIGNE DIRECTE: 1-800-663-5456

SCALE 0-8000 gr.

METTLER-TOLEDO INC.

FEUILLE DE TRAVAIL D'ÉTALONNAGE

CLIENT: IIS Intertech Adresse: 1590 32 Av. Lachine

[X] Inspection régulière [ ] Inspection Intérimaire Rapport (C.S.A.)#: 462486

balance: [ ] location: [ ]

fabricant: Mettler modèle: PBS601 # série: 1119053879

capacité: 8 kg graduation: 0.1 gr tolérance en service: .170

(selon la norme SOR/DORS 74/435 de Poids & Mesures Canada)

[X]	25% capacité	[ ]	25% **	[ ]	50% **	[ ]	75% **	[X] 100% **
[ ]	poids autres	[ ]	Poids autres	[ ]	Poids autres	[ ]	Poids autres	[ ] Poids autres

Poids utilisés [ ] lbs [X] kg [ ] g Résultats d'essais [ ] lbs [X] kg [ ] g

TEST DE COINS

2	Lecture	4	Lecture
	1999.9		2000.0
	Ajustement		Ajustement
	non		non
	Final		Final
	1999.9		2000.0
1	Lecture	3	Lecture
	2000.0		2000.1
	Ajustement		Ajustement
	non		non
	Final		Final
	2000.0		2000.1

	25% cap.	50% cap.	75% cap.	100%
Poids stand.	2 kg	4	6	8
Lecture	1999.9	3999.6	5999.5	7999.1
Ajust.	Oui / Non	Oui / Non	Oui / Non	Oui / Non
Final	2.000,0	4000.0	6000.0	8000.0

Les résultats des essais sont en KG ou en LBS

1 KG = 2.2046 lbs 1 LB = 0.4535 kg

Les poids certifiés utilisés pour la calibration des balances sont calibrés et certifiés par Poids & Mesure Canada selon la norme SOR/90/118 Section I II III

** NOTE: Le total des poids certifiés utilisés dépend de la capacité de la balance et des rectrictions physiques à l'application des poids certifiés. Les poids utilisés pour bâtir la charge de la balance seront considérés comme autres.

Poids certifiés utilisés #: Kit Certificat #: MES1310.11 Étalonnage dû: Janvier 2002

Poids certifiés utilisés #: Certificat #: Étalonnage dû:

Signature du technicien: Bernard Lefebvre Date: 2 Août 2001

Nom du technicien: Bernard Lefebvre (en lettres moulées s.v.p.) DATE PROCHAINE INSPECTION: Juillet 2002

METTLER-TOLEDO INC.

Remarques:

Ce formulaire complété doit être conservé par le contremaître pendant deux ans.
Le certificat des poids certifiés est répertorié aux Normes canadiennes à Ottawa, au Centre National de Recherche.

PROUVE:	STA5438F/ISO	DATE D'EMISSION:	27 octobre 1995
SIGNATURE:	Serge Gougeon	COPIE CONTROLEE:	Mettler-Toledo Inc.

PLATFORM SCALE

METTLER-TOLEDO INC.

FEUILLE DE TRAVAIL D'ÉTALONNAGE

CLIENT: DTS Intérieur Adresse: 1929 32e Avenue Lachine

[X] Inspection régulière [ ] Inspection Intérimaire Rapport (C.S.A.)#: 467486

balance: [ ] location: [ ]

fabricant: Eaton modèle: UNC600 # série: L-3990

capacité: 1000 lb graduation: .05 lb tolérance en service: .170

(selon la norme SOR/DORS 74/435 de Poids & Mesures Canada)

	[X] 25% capacité	[ ] 25%	[X] 50%	[ ] 75%	[ ] 100%
[ ] poids autres		[ ] ** Poids autres	[ ] ** Poids autres	[ ] ** Poids autres	[ ] ** Poids autres

Poids utilisés [ ] lbs [X] kg [ ] g Résultats d'essais [ ] lbs [X] kg [ ] g

TEST DE COINS

2 Lecture	111.86	4 Lecture 117.84
Ajustement	non	non
Final	117.86	117.84
1 Lecture	117.96	3 Lecture 117.82
Ajustement	non	non
Final	117.86	117.82

Poids stand. / Lecture / Ajust. / Final

25% cap.	50% cap.	75% cap.	100%
50kg	100kg	150kg	200kg
49.96	99.94	149.90	199.86
(Oui) Non	(Oui) Non	(Oui) Non	(Oui) Non
50.00	100.00	150.00	200.00

Les résultats des essais sont en KG ou en LBS

1 KG = 2.2046 lbs 1 LB = 0.4535 kg

Les poids certifiés utilisés pour la calibration des balances sont calibrés et certifiés par Poids & Mesure Canada selon la norme SOR/90/118 Section I II III

** NOTE: Le total des poids certifiés utilisés dépend de la capacité de la balance et des restrictions physiques à l'application des poids certifiés. Les poids utilisés pour bâtir la charge de la balance seront considérés comme autres.

Poids certifiés utilisés #: 1 à 10 Certificat #: 110991 Etalonnage dû: Avril 2002

Poids certifiés utilisés #: Certificat #: Étalonnage dû:

Signature du technicien: Bernard Lefebvre Date: 2 Août 2001

Nom du technicien: Bernard Lefebvre (en lettres moulées s.v.p.) DATE PROCHAINE INSPECTION: Juillet 2002

METTLER-TOLEDO INC.

Remarques: Remplacer base. Support plateforme pour le serré incorrectement. Replacer Ok.

Ce formulaire complété doit être conservé par le contremaître pendant deux ans.
Le certificat des poids certifiés est répertorié aux Normes canadiennes à Ottawa, au Centre National de Recherche.

ROUVE:	STA5438F/ISO	DATE D'EMISSION:	27 octobre 1995
IATURE:	Serge Gougeon	COPIE CONTROLÉE:	Mettler-Toledo Inc.

CALIBRATION WEIGHTS

CERTIFICAT D'ÉTALONNAGE

Client: Mettler Toledo
Adresse: 8262, boul. Pie IX, Montreal
Code postal: H1Z 3T6
Masse: 500 mg à 100 mg
N° de série: 40067
Fabricant: Mettler
Date d'étalonnage: 18-01-2001
Condition d'essai: Temp. °C: 22.1

N° de certificat: ME81310.71
Certification CCN n°: 24
Certification CLAS n°: 2000-01
Classe d'exactitude: OIML-F1
N° d'inventaire:
Densité assumée: 8.0
Date du prochain étalonnage: 18-01-2002
Pression kPa: 100.84 Humidité %: 22

Valeur nominale	Masse conventionnelle correction avant étalonnage (mg)	Masse conventionnelle correction après étalonnage (mg)	Tolérance (+ ou -) (mg)	Incertitudes (+ ou -) (mg)	Références utilisées	
					N° de série	Date d'étalonnage
500 mg	-0.0222	-0.0222	0.0800	0.0013	850-1	23-11-2000
200 mg	-0.0061	-0.0061	0.0600	0.0012	850-1	23-11-2000
200 mg •	-0.0053	-0.0053	0.0600	0.0022	850-1	23-11-2000
100 mg	0.0046	0.0046	0.0500	0.0012	850-1	23-11-2000

Pour la vérification des poids, nous utilisons les procédures du Conseil national de recherches du Canada (CNRC), procédure n° N.R.C.C. 25819. Notre étalon de référence est étalonné chaque année par le CNRC sous le numéro: INMS MS-361. Nos étalons de travail sont calibrés chaque six mois. Ce certificat ne peut être reproduit sans la permission écrite de Technisol inc.

Remarques:

Effectué par: S. Hamel *Approuvé par:* G. Lemieux *Date:* 23-01-2001

Effectué par Technisol inc. (Certificat CLAS du C.C.N.) pour Mettler-Toledo inc.

METTLER TOLEDO

CERTIFICAT D'ÉTALONNAGE

Client: Mettler Toledo
Adresse: 8282, boul. Pie IX, Montréal
Code postal: H1Z 3T6
Masse: 5 kg à 1 g
N° de série: 40081
Fabricant: Mettler
Date d'étalonnage: 18-01-2001
Condition d'essai: Temp. °C: 22.1

N° de certificat: MES1310.71
Certification CCN n°: 24
Certification CLAS n°: 2000-01
Classe d'exactitude: OIML-F1
N° d'inventaire:
Densité assumée: 8.0
Date du prochain étalonnage: 18-01-2002
Pression kPa: 100.84 Humidité %: 22

Valeur nominale	Masse conventionnelle correction avant étalonnage (mg)	Masse conventionnelle correction après étalonnage (mg)	Tolérance (+ ou -) (mg)	Incertitudes (+ ou -) (mg)	Références utilisées	
					N° de série	Date d'étalonnage
2 g •	0.0620	0.0620	0.1200	0.0036	850-1	23-11-2000
1 g	0.0413	0.0413	0.1000	0.0018	850-1	23-11-2000

Pour la vérification des poids, nous utilisons les procédures du Conseil national de recherches du Canada (CNRC), procédure n° N.R.C.C. 25819. Notre étalon de référence est étalonné chaque année par le CNRC sous le numéro: (N.M.S MS-361. Nos étalons de travail sont calibrés chaque six mois. Ce certificat ne peut être reproduit sans la permission écrite de Technisol inc.

Remarques:

Effectué par: S. Hamel *Approuvé par:* G. Lemieux *Date:* 23-01-2001

Effectué par Technisol inc. (Certificat CLAS du C.C.N.) pour Mettler-Toledo inc.

CERTIFICAT D'ÉTALONNAGE

Client: Mettler Toledo
Adresse: 8262 Boul. Pie IX, Montréal
Code postal: H1Z 3T6
Masse: 5 kg @ 500 mg
N° de série:
Fabricant: Mettler
Date d'étalonnage: 13 mars 2001
Condition d'essai: Temp. °C: 21,5

N° de certificat: ME81310.80
Certification CCN n°: 24
Certification CLAS n°: 2000-01
Classe d'exactitude: OIML-MI
N° d'inventaire: Bernard Lefebvre
Densité assumée: 8,0
Date du prochain étalonnage: 13 mars 2002
Pression kPa: 100,03 Humidité %: 28

Valeur nominale (kg/n°)	Masse conventionnelle correction avant étalonnage (mg)	Masse conventionnelle correction après étalonnage (mg)	Tolérance (+ ou -) (mg)	Incertitudes (+ ou -) (mg)	Références utilisées	
					N° de série	Date d'étalonnage
5-T103	-20,5	-20,5	250,0	2,5	850-3	23 nov. 2000
5-T28	-13,6	-13,6	250,0	2,5	850-3	23 nov. 2000
2-BL-9	-22,3	-22,3	100,0	1,3	850-3	23 nov. 2000
1-BL-8	-36,7	-36,7	50,0	1,3	850-2	23 nov. 2000
1-BL-7	0,3	0,3	50,0	1,3	850-2	23 nov. 2000

Pour la vérification des poids, nous utilisons les procédures du Conseil national de recherches du Canada (CNRC), procédure n° N.R.C.C. 25819. Notre étalon de référence est étalonné chaque année par le CNRC sous le numéro: INMS MS-361. Nos étalons de travail sont calibrés chaque six mois. Ce certificat ne peut être reproduit sans la permission écrite de Technisol inc.

Remarques:

Effectué par: S. Hamel *Approuvé par:* G. Lemieux *Date:* 14-03-2001

Effectué par Technisol inc. (Certificat CLAS du C.C.N.) pour Mettler-Toledo inc.

CERTIFICAT D'ÉTALONNAGE

Client: Mettler Toledo
Adresse: 8262 Boul. Pie IX, Montréal
Code postal: H1Z 3T6
Masse: 5 kg @ 500 mg
N° de série:
Fabricant: Mettler
Date d'étalonnage: 13 mars 2001
Condition d'essai: Temp. °C: 21,5

N° de certificat: ME81310.80
Certification CCN n°: 24
Certification CLAS n°: 2000-01
Classe d'exactitude: OIML-MI
N° d'inventaire: Bernard Lefebvre
Densité assumée: 8.0
Date du prochain étalonnage: 13 mars 2002
Pression kPa: 100,03 Humidité %: 28

Valeur nominale (g/n°)	Masse conventionnelle correction avant étalonnage (mg)	Masse conventionnelle correction après étalonnage (mg)	Tolérance (+ ou -) (mg)	Incertitudes (+ ou -) (mg)	Références utilisées	
					N° de série	Date d'étalonnage
500-BL-6	-15,9	-15,9	25,0	0,7	850-2	23 nov. 2000
500 BL-5	13,4	13,4	25,0	2,9	850-2	23 nov. 2000
100-BL-4	2,237	2,237	5,000	0,075	850-1	23 nov. 2000
100-BL-3	2,614	2,614	5,000	0,143	850-1	23 nov. 2000
100-BL-2	0,338	0,338	5,000	0,059	850-1	23 nov. 2000
100-BL-1	0,069	0,069	5,000	0,064	850-1	23 nov. 2000
50-7	1,216	1,216	3,000	0,026	850-1	23 nov. 2000
20-5	1,034	1,034	2,500	0,031	850-1	23 nov. 2000
10-4	1,308	1,308	2,000	0,016	850-1	23 nov. 2000
10-3	0,008	0,008	2,000	0,018	850-1	23 nov. 2000
5-2	0,7304	0,7304	1,5000	0,0065	850-1	23 nov. 2000
5-1	0,9124	0,9124	1,5000	0,0044	850-1	23 nov. 2000

Pour la vérification des poids, nous utilisons les procédures du Conseil national de recherches du Canada (CNRC), procédure n° N.R.C.C. 25819. Notre étalon de référence est étalonné chaque année par le CNRC sous le numéro: INMS MS-361. Nos étalons de travail sont calibrés chaque six mois. Ce certificat ne peut être reproduit sans la permission écrite de Technisol inc.

Remarques:

Effectué par: S. Hamel *Approuvé par:* G. Lemieux *Date:* 14-03-2001

Effectué par Technisol inc. (Certificat CLAS du C.C.N.) pour Mettler-Toledo inc.

CERTIFICAT D'ÉTALONNAGE

Client: Mettler Toledo
Adresse: 8262 Boul. Pie IX, Montréal
Code postal: H1Z 3T6
Masse: 5 kg @ 500 mg
N° de série:
Fabricant: Mettler
Date d'étalonnage: 13 mars 2001
Condition d'essai: Temp. °C: 21,5

N° de certificat: ME81310.80
Certification CCN n°: 24
Certification CLAS n°: 2000-01
Classe d'exactitude: OIML-MI
N° d'inventaire: Bernard Lefebvre
Densité assumée: 8.0
Date du prochain étalonnage: 13 mars 2002
Pression kPa: 100,03 Humidité %: 28

Valeur nominale (mg/n°)	Masse conventionnelle correction avant étalonnage (mg)	Masse conventionnelle correction après étalonnage (mg)	Tolérance (+ ou -) (mg)	Incertitudes (+ ou -) (mg)	Références utilisées	
					N° de série	Date d'étalonnage
500	0,3077	0,3077	0.8000	0.0013	850-1	23 nov. 2000
500 •	0,4665	0,4665	0.8000	0,0012	850-1	23 nov. 2000
500 ••	0,2293	0,2293	0.8000	0,0009	850-1	23 nov. 2000
500 •••	0,3933	0,3933	0.8000	0,0015	850-1	23 nov. 2000
500 ••••	0,4593	0,4593	0,8000	0,0015	850-1	23 nov. 2000

Pour la vérification des poids, nous utilisons les procédures du Conseil national de recherches du Canada (CNRC), procédure n° N.R.C.C. 25819. Notre étalon de référence est étalonné chaque année par le CNRC sous le numéro: INMS MS-361. Nos étalons de travail sont calibrés chaque six mois. Ce certificat ne peut être reproduit sans la permission écrite de Technisol inc.

Remarques:

Effectué par: S. Hamel *Approuvé par:* G. Lemieux *Date:* 14-03-2001

Effectué par Technisol inc. (Certificat CLAS du C.C.N.) pour Mettler-Toledo inc.

Mesures Canada
La mesure juste pour tous

Measurement Canada
Fair Measure For All

CERTIFICAT D'ÉTALONNAGE
Étalons gravimétriques
CALIBRATION CERTIFICATE
Gravimetric Standards

Émis à - Issued to		*Numéro du jeu de poids - Weight set number*
Mettler / Toledo		BL
Adresse - Address		*Date d'émission - Issue date*
8262 Boul Pie IX, Montreal, Qc H1Z 3T6		avr 19 2001
Contact	*No. de téléphone - Telephone no.*	*Date du réétalonnage - Recalibration due*
Claude Mainville	514-376-0763	avr 19 2002

Je, soussigné(e), certifie que l' (les) étalon(s) identifié(s) ci-dessous a (ont) été étalonné(s) conformément à la Partie III du Règlement sur les poids et mesures par rapport aux étalons de référence de Mesures Canada, qui à leur tour ont été étalonnés par rapport au prototype canadien du kilogramme qui est étalonné et retraçable au prototype international du kilogramme conservé au Bureau International des Poids et Mesures.

I, the undersigned, hereby certify that the standard(s) identified below has (have) been calibrated in accordance with Part III of the Weights and Measures Regulations in relation to Measurement Canada's reference standards which in turn have been calibrated in relation to Canada's prototype for the kilogram whose calibration is traceable to the international prototype for the kilogram maintained by the Bureau International des Poids et Mesures.

Numéro d'identification Identification No.	Valeur nominale Nominal Value	Numéro d'identification Identification No.	Valeur nominale Nominal Value	Numéro d'identification Identification No.	Valeur nominale Nominal Value	Numéro d'identification Identification No.	Valeur nominale Nominal Value
1	10 kg	14	10 kg				
2	10 kg	15	10 kg				
3	10 kg	16	10 kg				
4	10 kg	17	10 kg				
5	10 kg	18	10 kg				
6	10 kg	19	10 kg				
7	10 kg	20	10 kg				
8	10 kg						
9	10 kg						
10	10 kg						
11	10 kg						
12	10 kg						
13	10 kg						

District	*No. du certificat - Certificate No.*	*Étalon local utilisé - Local standard used*
	1109491	M32623

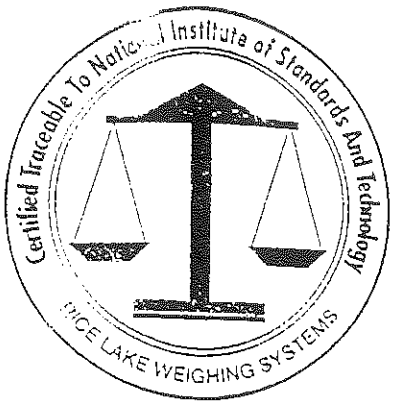
Signature	*Date*	*Titre du poste - Position Title*

Un organisme d'Industrie Canada
An Agency of Industry Canada

Canada

#180-195

TMAP TRACEABLE CERTIFICATE



Purchase Order Number	1684
Company	GENEQ INC
Address	8047 JARRY ST E
	MONTREAL, PQ H1S 1H6
City & State	CANADA
Date Received	8-28-96
Date of Test	9-16-96
Temperature	22°C
RH	45%
mmHg	731.8
Description of Weights	10mg-500mg Polished Kit, Class "1", S/N S864
Density (g/cm³)	Assumed 7.95 g/cm³

Traceable Report Number: 228853
(Rice Lake Weighing Systems) NIST Certificate Number 822/254143-94
Tested By 03 Balance Used 634-Q
Weighing Design Modified Substitution
Last Date Primary Standard Was Calibrated 11-2-94 Due 11-2-04
Last Date Working Standard Was Calibrated 6-13-96 Due 10-13-96
Standards Used 594-Q

NOMINAL MASS VALUE	AS FOUND vs. 8.0 g/cm³	AS LEFT vs. 8.0 g/cm³	TOLERANCE	UNCERTAINTY MILLIGRAMS
10 mg	0.003 mg	0.003 mg	0.010 mg	0.003 mg
20 mg	0.004 mg	0.004 mg	0.010 mg	0.002 mg
20 mg w/dot	0.003 mg	0.003 mg	0.010 mg	0.002 mg
50 mg	0.000 mg	0.000 mg	0.010 mg	0.003 mg
100 mg	0.001 mg	0.001 mg	0.010 mg	0.005 mg
200 mg	0.004 mg	0.004 mg	0.010 mg	0.005 mg
200 mg w/dot	0.004 mg	0.004 mg	0.010 mg	0.005 mg
500 mg	0.000 mg	0.000 mg	0.010 mg	0.006 mg

☐ This report contains data not covered by ANSI/NCSL Z540-1

Check with your local state agency for certification of compliance on legal-for-trade items.

Prepared By:

RICE LAKE WEIGHING SYSTEMS
METROLOGICAL PRODUCTS & SERVICES GROUP ISO 9001 REGISTERED
230 West Coleman Street • Rice Lake, WI 54868 • USA
TEL: 715-234-9171 • FAX: 715-234-6967

Dated 09-16-96

Signed Debbie Schieffer

Title DEBBIE SCHIEFFER
LAB TECHNICIAN

This report is not to be used to claim product endorsement by Rice Lake Weighing Systems or any agency of the U.S. Government.
This document shall not be reproduced, except in full, without the written approval of Rice Lake Weighing Systems' Metrology Laboratory.

PN 35659 4/96

COMPAGNIE MARCONI CANADA
CANADIAN MARCONI COMPANY

600, Boulevard Dr.-Frederik-Philips
Ville Saint-Laurent (Québec), Canada H4M 2S9
Téléphone: (514) 748-3148 Fax: (514) 748-3014

Certificat/Certificate 27295-542

CERTIFICAT D'ÉTALONNAGE - CALIBRATION CERTIFICATE

Client / Customer: GENEQ INC.

Instrument: WEIGHTS — Type: 294 - Pd

Fabricant / Manufacturer: OHAUS — No de série / Serial No: —

No de stock du client / Customer inventory No: 5852 — Procédé d'étalonnage / Calibration procedure: NIST HANDBOOK III

Cycle d'étalonnage / Calibration cycle: 1 YEAR — Date d'échéance / Due date: 07 OCT '97

La présente sert à certifier que l'on a procédé à l'étalonnage de l'instrument décrit ci-dessus, avec les étalons de la Société, qui sont approuvés par le Conseil national de recherches - Canada ou par le National Institute of Standards and Technology des E.-U. (ou les deux). L'étalonnage a été effectué selon vos exigences.

This is to certify that the instrument listed above was calibrated against Company Standards which are directly traceable to the National Research Council, Canada and/or the National Institute of Standards, U.S.A. Calibration was performed in accordance with your requirements.

ÉTAT DE L'INSTRUMENT/CONDITIONS OF INSTRUMENT

À la réception / Received

[X] Selon les spécs. IN specs.	[ ] Hors des spécs. OUT of specs.	[ ] Réparation nécessaire Required repair

Au retour / Returned

[X] Selon les spécs. IN specs.	[ ] Hors des spécs. OUT of specs.

CONDITIONS DE MESURE/MEASUREMENT CONDITIONS

Température / Temperature: 20,02 °C — Humidité / Humidity: 44.67 %

COMPAGNIE MARCONI CANADA
CANADIAN MARCONI COMPANY

Étalons utilisés / Transfer standards: Bc 5477, 101713

COMMENTAIRES / REMARKS

07 oct '96 — Date

Technicien / Technician

Approuvé par / Approved by

COMPAGNIE MARCONI CANADA
CANADIAN MARCONI COMPANY
600, boulevard Dr.-Frederik-Philips,
Ville Saint-Laurent (Québec) Canada H4M 2S9
Tél:(514) 748-3148 Télécopieur: 340-3014

N° O.T. CMC 27295-54
CMC W/O NO.

Page 2 de 2
Sheet of

DONNÉES SUR L'ÉTALONNAGE — CALIBRATION DATA SHEET

INSTRUMENT WEIGHT TYPE 294-Pa.

NUMÉRO DE SÉRIE — SERIAL NUMBER —

N° INVENT.—CLIENT CUST. INV. NO. 5882

FONCTION VÉRIFIÉE FUNCTION TESTED	LECTURE READING	TOLÉRANCE TOLERANCE
CLASS:	NIST	"P"
Gram	Gram	MG
100,00	100,0007	± 4
200,00	200,0019	± 8
200,00	200,0026	± 8
500,00	500,00	± 20

FONCTION VÉRIFIÉE FUNCTION TESTED	LECTURE READING	TOLÉRANCE TOLERANCE

7 OCT '96
DATE

TECHNICIEN – TECHNICIAN

APPROUVÉ PAR – APPROVED BY

LABORATOIRES DE NORMALISATION
STANDARD CALIBRATION LABORATORIES

CMC COMPAGNIE MARCONI CANADA
CANADIAN MARCONI COMPANY

600, Boulevard Dr.-Frederik-Philips
Ville Saint-Laurent (Québec), Canada H4M 2S9
Téléphone: (514) 748-3148 Fax: (514) 748-3014

Certificat/Certificate 27295-543

CERTIFICAT D'ÉTALONNAGE - CALIBRATION CERTIFICATE

Client
Customer GENEQ INC.

Instrument WEIGHTS Type 1 & 2 kg.

Fabricant
Manufacturer -

No de série
Serial No S-862/S-863

No de stock du client
Customer inventory No -

Procédé d'étalonnage
Calibration procedure NIST HANDBOOK III

Cycle d'étalonnage
Calibration cycle 1 YEAR

Date d'échéance
Due date 07 oct '97

La présente sert à certifier que l'on a procédé à l'étalonnage de l'instrument décrit ci-dessus, avec les étalons de la Société, qui sont approuvés par le Conseil national de recherches - Canada ou par le National Institute of Standards and Technology des E.-U. (ou les deux). L'étalonnage a été effectué selon vos exigences.

This is to certify that the instrument listed above was calibrated against Company Standards which are directly traceable to the National Research Council, Canada and/or the National Institute of Standards, U.S.A. Calibration was performed in accordance with your requirements.

ÉTAT DE L'INSTRUMENT/CONDITIONS OF INSTRUMENT

À la réception / Received

☑ Selon les spécs. / IN specs. ☐ Hors des spécs. / OUT of specs. ☐ Réparation nécessaire / Required repair

Au retour / Returned

☑ Selon les spécs. / IN specs. ☐ Hors des spécs. / OUT of specs.

CONDITIONS DE MESURE/MEASUREMENT CONDITIONS

Température / Temperature 20.0 °C Humidité / Humidity 43,8 %

CMC COMPAGNIE MARCONI CANADA
CANADIAN MARCONI COMPANY

Étalons utilisés / Transfer standards 101733, Co 3447, Co 3448

COMMENTAIRES / REMARKS

7 oct 96
Date

Technicien / Technician

Approuvé par / Approved by

COMPAGNIE MARCONI CANADA
CANADIAN MARCONI COMPANY
600, boulevard Dr.-Frederik-Philips,
Ville Saint-Laurent (Québec) Canada H4M 2S9
Tél:(514) 748-3148 Télécopieur: 340-3014

N° O.T. CMC 27295-5
CMC W/O NO.

Page 2 de 2
Sheet of

DONNÉES SUR L'ÉTALONNAGE — CALIBRATION DATA SHEET

INSTRUMENT WEIGHTS TYPE 1 & 2 Kg

NUMÉRO DE SÉRIE / SERIAL NUMBER 5862 / 5863 N° INVENT.—CLIENT / CUST. INV. NO. —

FONCTION VÉRIFIÉE FUNCTION TESTED	LECTURE READING	TOLÉRANCE TOLERANCE
Kgs	Kgs	mg
1,000	1,000 01	N/A
2,000	2.000 01	N/A
CLASS: UNKNOWN.		

FONCTION VÉRIFIÉE FUNCTION TESTED	LECTURE READING	TOLÉRANCE TOLERANCE

Oct '96
DATE

TECHNICIEN – TECHNICIAN

APPROUVÉ PAR – APPROVED BY

LABORATOIRES DE NORMALISATION
STANDARD CALIBRATION LABORATORIES

CALIBRATION GASES

AIR LIQUIDE
ELECTRONICS

CERTIFICATE of ANALYSIS

Date: August 2, 1995
Order Number: 1071754
Cylinder Number: 03622559

Customer: Canadian Liquid Air
PO Number: 25423
Lot Number: 978-208-95-E7-E

Component	Specification	Analytical Result
Carbon Monoxide	0.5 %	0.49 %
Carbon Dioxide	5 %	5.02 %
Oxygen	6.5 %	6.50 %
Nitrogen	Balance	Balance

O2 traceable to NIST SRM 2659a
CO2 traceable to NIST SRM 1675b
CO traceable to NIST SRM 2640a

Cylinder Size: 44
Contents: 5098 liters

Valve: CGA 590
Pressure: 1650 psig

The analytical results reported within this certificate are based on accepted analytical methodology, and are correct to the analytical accuracy of this methodology.

Chemist: _____

AIR LIQUIDE AMERICA CORPORATION 19 Steel Road West, Morrisville, PA 19067-3698
Phone (215) 428-4600 • Fax (215) 428-4625

AIR LIQUIDE
ELECTRONICS

CERTIFICATE of ANALYSIS

Date: August 2, 1995
Order Number: 1071754
Cylinder Number: 2H25232

Customer: Canadian Liquid Air
PO Number: 25423
Lot Number: 978-208-95-E7-D

Component	Specification	Analytical Result
Carbon Monoxide	1.5 %	1.51 %
Carbon Dioxide	10 %	10.0 %
Oxygen	12.5 %	12.5 %
Nitrogen	Balance	Balance

O2 traceable to NIST SRM 2659a
CO2 traceable to NIST SRM 1675b
CO traceable to NIST SRM 2640a

Cylinder Size: 44
Contents: 5132 liters

Valve: CGA 590
Pressure: 1650 psig

The analytical results reported within this certificate are based on accepted analytical methodology, and are correct to the analytical accuracy of this methodology.

Chemist: _____

AIR LIQUIDE AMERICA CORPORATION 19 Steel Road West, Morrisville, PA 19067-3698
Phone (215) 428-4600 • Fax (215) 428-4625

AIR LIQUIDE
ELECTRONICS

CERTIFICATE of ANALYSIS

Date: August 2, 1995
Order Number: 1071754
Cylinder Number: T108034

Customer: Canadian Liquid Air
PO Number: 25423
Lot Number: 978-208-95-E7-C

Component	Specification	Analytical Result
Carbon Monoxide	1.7 %	1.69 %
Carbon Dioxide	17 %	16.9 %
Oxygen	21.5 %	21.5 %
Nitrogen	Balance	Balance

O2 traceable to NIST SRM 2659a
CO2 traceable to NIST SRM 1675b
CO traceable to NIST SRM 2640a

Cylinder Size: 44
Contents: 5206 liters

Valve: CGA 590
Pressure: 1650 psig

The analytical results reported within this certificate are based on accepted analytical methodology, and are correct to the analytical accuracy of this methodology.

Chemist: _____

AIR LIQUIDE AMERICA CORPORATION 19 Steel Road West, Morrisville, PA 19067-3698
Phone (215) 428-4600 • Fax (215) 428-4625

METERING SYSTEM 1 & 2

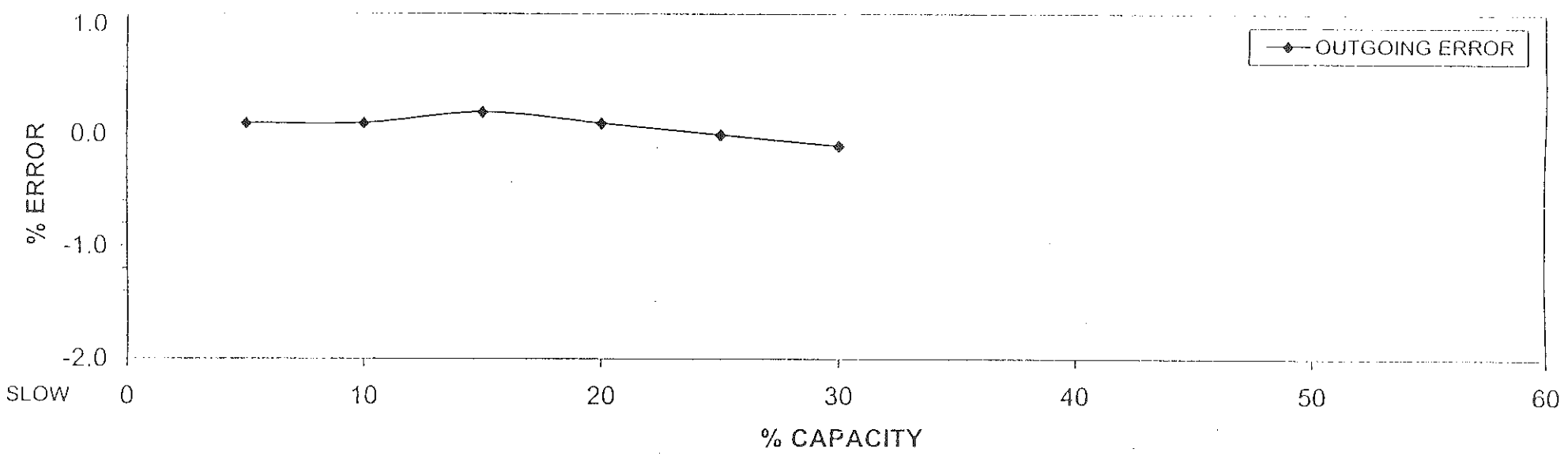
CF NO.: 0221
Jan-2001

CANADIAN METER COMPANY INC.

CALIBRATION CERTIFICATE

FLOWRATE (AIR) CFH	% CAPACITY (AIR)	INCOMING %PROOF	INCOMING %ERROR

FLOWRATE (AIR) CFH	% CAPACITY (AIR)	OUTGOING %PROOF	OUTGOING %ERROR
10	5	99.9	0.1
20	10	99.9	0.1
30	15	99.8	0.2
40	20	99.9	0.1
50	25	100.0	0.0
60	30	100.1	-0.1



% Proof =(Vp/Vm) x 100; Vm = Meter Volume
% Error =[(Vm-Vp / Vp] x 100; Vp = Prover Volume
% Accuracy = (Vm/Vp) x 100
1 L = 0.03531 cu.ft.

Calibrated with air to Canadian Meter Co. flow standards with a process accuracy of ± 0.2%, which are traceable to the National Research Council - Ottawa Canada. Meter tested on Bell Prover #QA-2BM-1 to 60 Deg. F base.

TECH. SERVICES: _____ Date: Jan. 08/2001

METER MODEL:	DTM-200
DATE:	21-Dec-2000
CUSTOMER:	Conval
PIN (in. w.c.):	2
M.A.O.P.:	5 PSIG
SERIAL NO.:	98Y990002
INDEX READING:	973.345 Ft^3

INTERTEK TESTING SERVICES NA LTD.
LACHINE, QUÉBEC, CANADA
POST TEST DRY GAS METER CALIBRATION DATA

MANUFACTURER: CHEMINÉES SÉCURITÉ MODEL: BIS VISTA LTO: 3008830 DATE: 2001-12-30 TECHNICIAN: CLAUDE PARÉ

BAROMETRIC PRESSURE: 29.91 CALIBRATION FACTOR DGM#1: 0.994 DGM#2: 1.003 STANDARDIZED DGM#3: 1.001

		STANDARD METER					METER #1					
TRAIL NO.	PRESS DROP	FINAL FT.³	INITIAL FT.³	CHANGE FT.³	TEMP °F	STD FT.³	FINAL FT.³	INITIAL FT.³	CHANGE FT.³	TEMP °F	STD. FT.³	CAL. FACTOR
1	0	392.600	392.400	0.200	71.4	0.199	424.064	423.864	0.200	72.0	0.198	1.006
2	0	393.000	392.800	0.200	71.5	0.199	424.468	424.267	0.201	72.0	0.199	1.001
3	0	393.400	393.200	0.200	71.5	0.199	424.870	424.668	0.202	72.0	0.200	0.996

AVERAGE CALIBRATION FACTOR: 1.001

PREVIOUS CAL. FACTOR	MINUS	AVERAGE CAL.FACTOR	DIVIDED BY	PREVIOUS CAL.FACTOR	MULTIPLIED *100	EQUALS	DEVIATION PERCENT
0.994	-	1.001	1	0.994	*100	=	−0.7 %

		STANDARD METER					METER #2					
TRAIL NO.	PRESS DROP	FINAL FT.³	INITIAL FT.³	CHANGE FT.³	TEMP °F	STD. FT.³	FINAL FT.³	INITIAL FT.³	CHANGE FT.³	TEMP °F	STD. FT.³	CAL. FACTOR
1	0	393.900	393.700	0.200	71.7	0.199	445.740	445.535	0.205	72.4	0.203	0.981
2	0	394.300	394.100	0.200	71.9	0.198	446.135	445.938	0.197	72.3	0.195	1.016
3	0	394.700	394.500	0.200	72.0	0.198	446.542	446.333	0.209	72.4	0.207	0.957

AVERAGE CALIBRATION FACTOR: 0.985

PREVIOUS CAL. FACTOR	MINUS	AVERAGE CAL. FACTOR	DIVIDED BY	PREVIOUS CAL. FACTOR	MULTIPLIED *100	EQUALS	DEVIATION %
1.003	-	0.985	1	1.003	*100	=	1.8 %

192-am-9904

INTERTEK TESTING SERVICES NA LTD.
LACHINE, QUÉBEC, CANADA
SIX MONTH DRY GAS METER CALIBRATION DATA

MANUFACTURER: _____ MODEL: _____ LTO: _____ DATE: 2001-11-30 TECHNICIAN: CLAUDE PARÉ

BAROMETRIC PRESSURE: 29.91 CALIBRATION FACTOR DGM#1: 0.994 DGM#2: 1.003 STANDARDIZED DGM#3: 1.001

	STANDARD METER					METER #1					
FLOW RATE FT.³	FINAL FT.³	INITIAL FT.³	CHANGE FT.³	TEMP °F	STD FT.³	FINAL FT.³	INITIAL FT.³	CHANGE FT.³	TEMP °F	STD. FT.³	CAL. FACTOR
0.046/min	395.191	395.100	0.091	72.0	0.090	425.110	425.018	0.092	72.5	0.091	0.990
0.093/min	395.535	395.350	0.185	72.0	0.184	425.475	425.290	0.185	72.5	0.183	1.006
0.151/min	396.101	395.800	0.301	72.2	0.299	426.072	425.769	0.303	72.7	0.300	0.998
0.224/min	396.848	396.400	0.448	72.0	0.444	426.856	426.408	0.448	72.7	0.444	1.001
0.315/min	397.930	397.300	0.630	72.0	0.625	428.985	427.356	0.629	72.7	0.623	1.004

AVERAGE CALIBRATION FACTOR: 1.000

	STANDARD METER					METER #2					
FLOW RATE FT.³	FINAL FT.³	INITIAL FT.³	CHANGE FT.³	TEMP °F	STD. FT.³	FINAL FT.³	INITIAL FT.³	CHANGE FT.³	TEMP °F	STD. FT.³	CAL. FACTOR
0.042/min	398.383	398.300	0.083	71.9	0.082	446.855	446.772	0.083	72.6	0.082	1.001
0.098/min	398.695	398.500	0.195	71.9	0.194	447.194	446.998	0.196	72.5	0.194	1.001
0.149/min	399.197	398.900	0.297	71.7	0.295	447.730	447.431	0.299	72.4	0.296	0.998
0.233/min	399.965	399.500	0.465	71.6	0.462	448.540	448.074	0.466	72.5	0.462	1.001
0.317/min	400.934	400.300	0.634	71.6	0.629	449.546	448.914	0.630	72.4	0.627	1.004

AVERAGE CALIBRATION FACTOR: 1.001

CALIBRATOR T/C

PRIMO INSTRUMENT INC
4407 RUE CHARLEROI
MONTREAL-NORD, QC
H1H-1T6
TEL.: (514) 329-3242
TEL.: (888) 774-6665
FAX : (514) 329-3750 (VENTES/SALES)
FAX : (514) 329-5869 (SERVICES)
http : //www.primoinstrument.com

CERTIFICATE OF CALIBRATION
CERTIFICAT DE CALIBRATION

CERTIFICATE No / Certificat No :	27962
CUSTOMER / Client :	SERVICES D'ESSAIS INTERTEK LTEE
DESCRIPTION / Description :	CALIBRATEUR
MANUFACTURER / Manufacturier :	OMEGA
MODEL / Modèle :	CL23A
SERIAL No / No serie	T-192959
ASSET No / No d'appareil	

	YES / Oui	NO / Non
REPAIR /Réparation :	☐	☑
CONDITION / Etat :	Out of spec./ hors normes	In spec. / selon les normes
RECEIVED / Arrivé :	☐	☑
RETURNED / Départ :	☐	☑

DATE / Date : 30-mai-2001 DUE DATE / Date due: 30-mai-2002

TEMPERATURE : Température : 23.0°C HUMIDITY : Humidité : 35%

STANDARDS USED : Standards utilisés : PR0078

The standards used are traceable to NRCC and / or NIST.
Les standards utilisés sont identifiés et retraçables NRCC et / ou NIST.

OTHERS / Autres :

NOTES / Notes :
Le ratio a 1000°F est de 1/1 et de 2/1 pour les autres points de lectures
The ratio at 1000°F is 1/1 and 2/1 at the others readings

TECHNICIAN : Technicien : J. BOURBONNIERE

QUALITY CONTROL : Contrôle Qualité :

REGISTERED ENREGISTRÉ ISO 9002

PRIMO INSTRUMENT

CERTIFICATE No / Certificat No : 27962

CUSTOMER / Client : SERVICES D'ESSAIS INTERTEK LTEE

DESCRIPTION / Description : CALIBRATEUR

MANUFACTURER / Manufacturier : OMEGA

MODEL / Modèle : CL23A

DESCRIPTION Description		LIMITS Limites	READING Lectures	LIMITS Limites
TEMPÉRATURE TYPE K				
Entrée	-300 °F	-301.0	-300.8	-299.0
	75.2 °F	74.7	74.8	75.7
	1000 °F	999.5	999.8	1000.5
	2500 °F	2499.0	2500.2	2501.0
Sortie	-300 °F	-301.0	-299.8	-299.0
	32 °F	31.5	32.2	32.5
	300 °F	299.5	300.2	300.5
	600 °F	599.5	600.2	600.5
	1200 °F	1199.5	1200.3	1200.5
	2000 °F	1999.2	2000.1	2000.8
TEMPÉRATURE TYPE T				
Entrée	-300 °F	-301.0	-300.4	-299.0
	75.2 °F	74.7	75.1	75.7
	300 °F	299.5	299.9	300.5
	600 °F	599.5	600.1	600.5
Sortie	-300 °F	-301.0	-299.9	-299.0
	75.2 °F	74.7	75.2	75.7
	300 °F	299.5	299.8	300.5
	600 °F	599.5	599.9	600.5
TEMPÉRATURE TYPE J				
Entrée	-300 °F	-301.0	-300.1	-299.0
	75.2 °F	74.7	74.8	75.7
	300 °F	299.5	300.0	300.5
	1000 °F	999.5	1000.1	1000.5
Sortie	-300 °F	-301.0	-299.9	-299.0
	32 °F	31.5	32.0	32.5
	300 °F	299.5	299.8	300.5
	800 °F	799.5	799.7	800.5
	1200 °F	1199.5	1200.0	1200.5
		Défect.	Ok	
VÉRIFICATION °C		☐	☑	

TECHNICIAN : J. BOURBONNIERE
Technicien :

QUALITY CONTROL :
Contrôle Qualité :

TEMPERATURE RECORDER

Date: 2001-11-05

Technicien: CLAUDE PARÉ

d'équipement: 180-055

Vérifié avec l'appareil #: 180-223

T/C Calibrateur	Δerreur	T/C lecteur	ΔT/C
32.0		31.8	
77.0		75.7	
212.0		210.9	
392.0		391.4	
572.0		571.7	
752.0		752.0	
932.0		932.4	
1112.0		1112.9	
1292.0		1293.1	
1382.0		1383.0	
		Précision de l'appareil:	

192bf0001

Date: 2001-11-05

Technicien: CLAUDE PARÉ

d'équipement: 180-056

Vérifié avec l'appareil #: 180-223

T/C Calibrateur	Δerreur	T/C lecteur	ΔT/C
32.0		31.4	
77.0		75.3	
212.0		210.6	
392.0		391.1	
572.0		571.3	
752.0		751.6	
932.0		932.1	
1112.0		1112.5	
1292.0		1292.7	
1382.0		1382.8	
		Précision de l'appareil:	

1926f0001

Date: 2001-11-05

Technicien: CLAUDE PARÉ

d'équipement: 180-058

Vérifié avec l'appareil #: 180-223

T/C Calibrateur	Δerreur	T/C lecteur	ΔT/C
32.0		31.9	
77.0		75.7	
212.0		211.0	
392.0		391.5	
572.0		571.7	
752.0		752.0	
932.0		932.4	
1112.0		1112.9	
1292.0		1293.0	
1382.0		1383.0	
		Précision de l'appareil:	

192bf0001

Date: 2001-11-05 Technicien: CLAUDÉ PARÉ

d'équipement: 180-059

Vérifié avec l'appareil #: 180-223

T/C Calibrateur	Δerreur	T/C lecteur	ΔT/C
32.0		31.4	
77.0		75.3	
212.0		210.5	
392.0		391.0	
572.0		571.2	
752.0		751.6	
932.0		932.0	
1112.0		1112.4	
1292.0		1292.6	
1382.0		1382.7	
		Précision de l'appareil:	

192bf0001

MOISTURE METER

ITS Intertek Testing Services

Date: 2001-12-07 Tech: CLAUDE PAGÉ

CALIBRATION DATA LOG SHEET
OVEN DRY METHOD

EQUIPMENT

Make	Model	WH No.
DELMHORST	J-2000	180-219

RESULTS

Wood sample weight (g)		Moisture content: M_d ☒ M_w ☐		% Deviation
W_i	W_d	Calculated	Measured	
479.4	399.4	20.03	20.06	3 %

AVERAGE DEVIATION:

WET BASIS:(M_w)_____% DRY BASIS:(M_D)_____%

CALCULATIONS:

$M_d = (W_i - W_d) / W_d \times 100$ $M_w = (W_i - W_d) / W_i \times 100$

WHERE
M_D = MOISTURE CONTENT ON THE DRY BASIS
M_R = WEIGHT OF MOISTURE REMOVED IN THE OVEN
M_w = MOISTURE CONTENT ON THE WET BASIS
W_o = WEIGHT OF OVEN DRY WOOD
W_i = INITIAL WEIGHT OF WOOD INCLUDING MOISTURE

192-at-9906

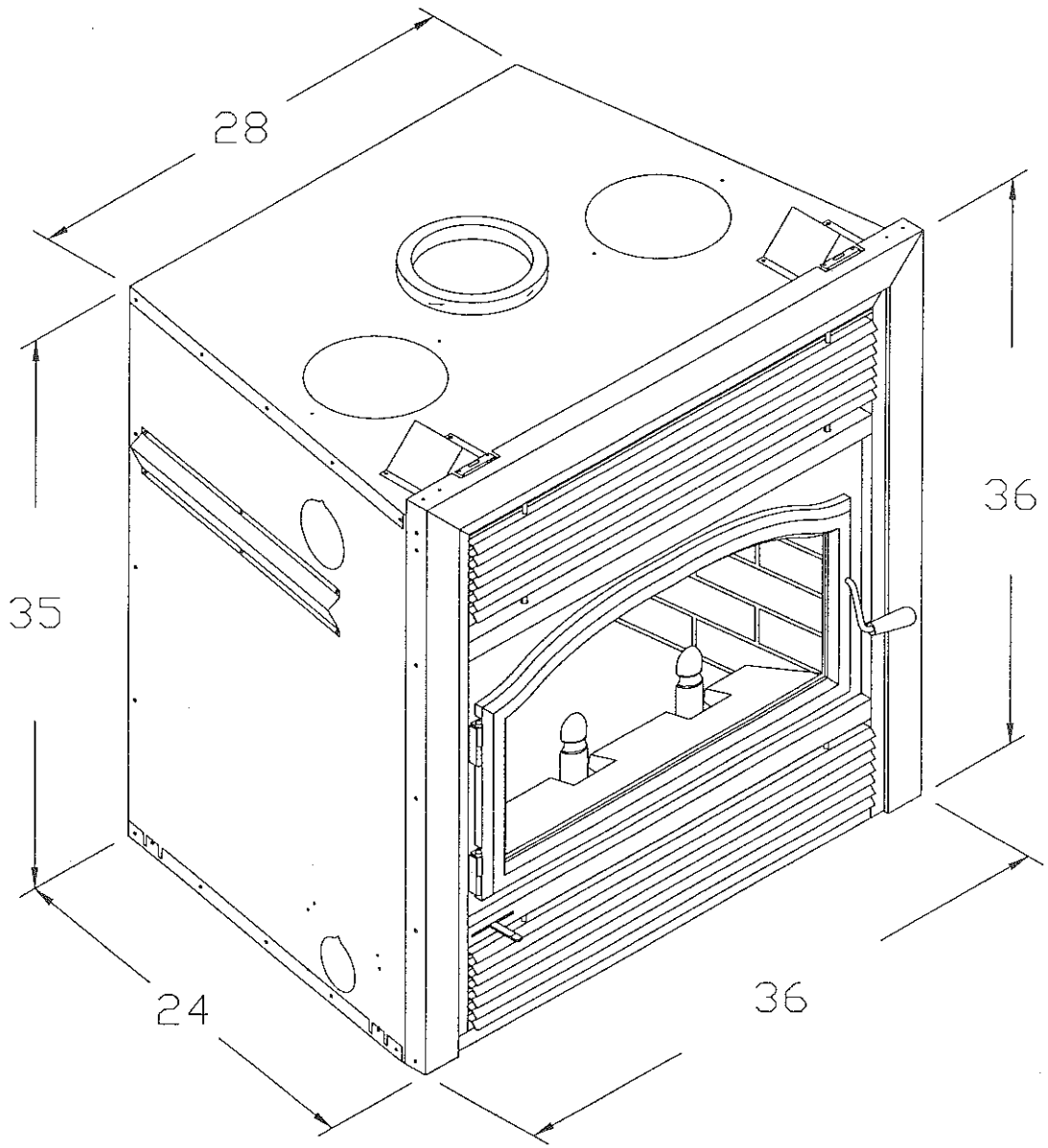
Intertek Testing Services NA Ltd.
1829 32nd Avenue, Lachine, Quebec H8T 3J1 Canada
Telephone 514-631-3100 Fax 514-631-1133 Home Page www.worldlab.com

APPENDIX E
Drawings and Specifications

Section E-1 : Fireplace and firebox dimensions
Section E-2 : Fireplace and door fabrication drawings with components

Section E-1

FIREPLACE AND FIREBOX DIMENSIONS



REV.	DESCRIPTION	DE:

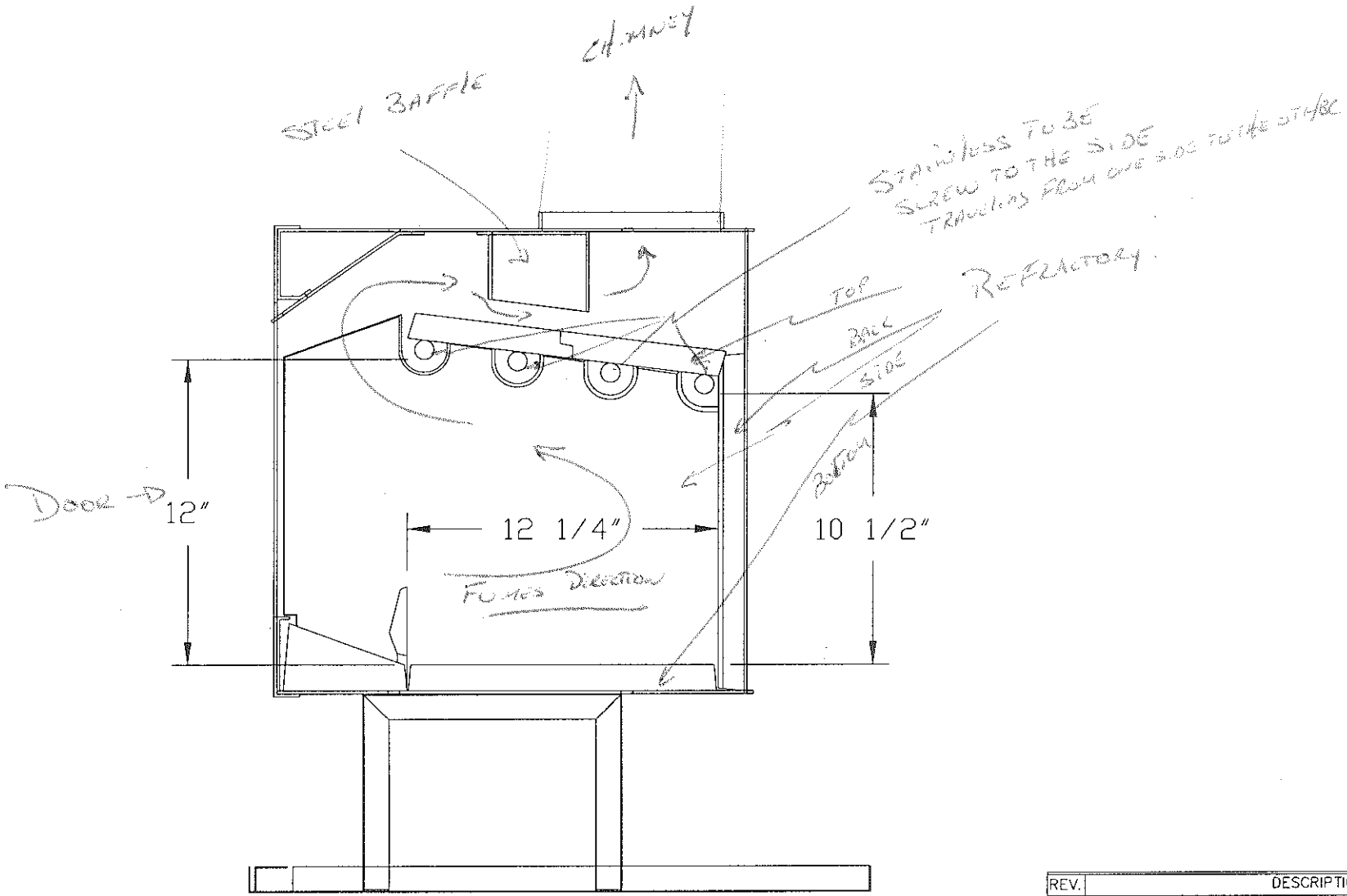
CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: NOV. 19, 01
ECH./SCALE: N/A
VERIFIE/CHECKED:
CODE:
PAGE: 1 of 1

SECURITY CHIMNEYS INTERNATIONAL LTD
CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

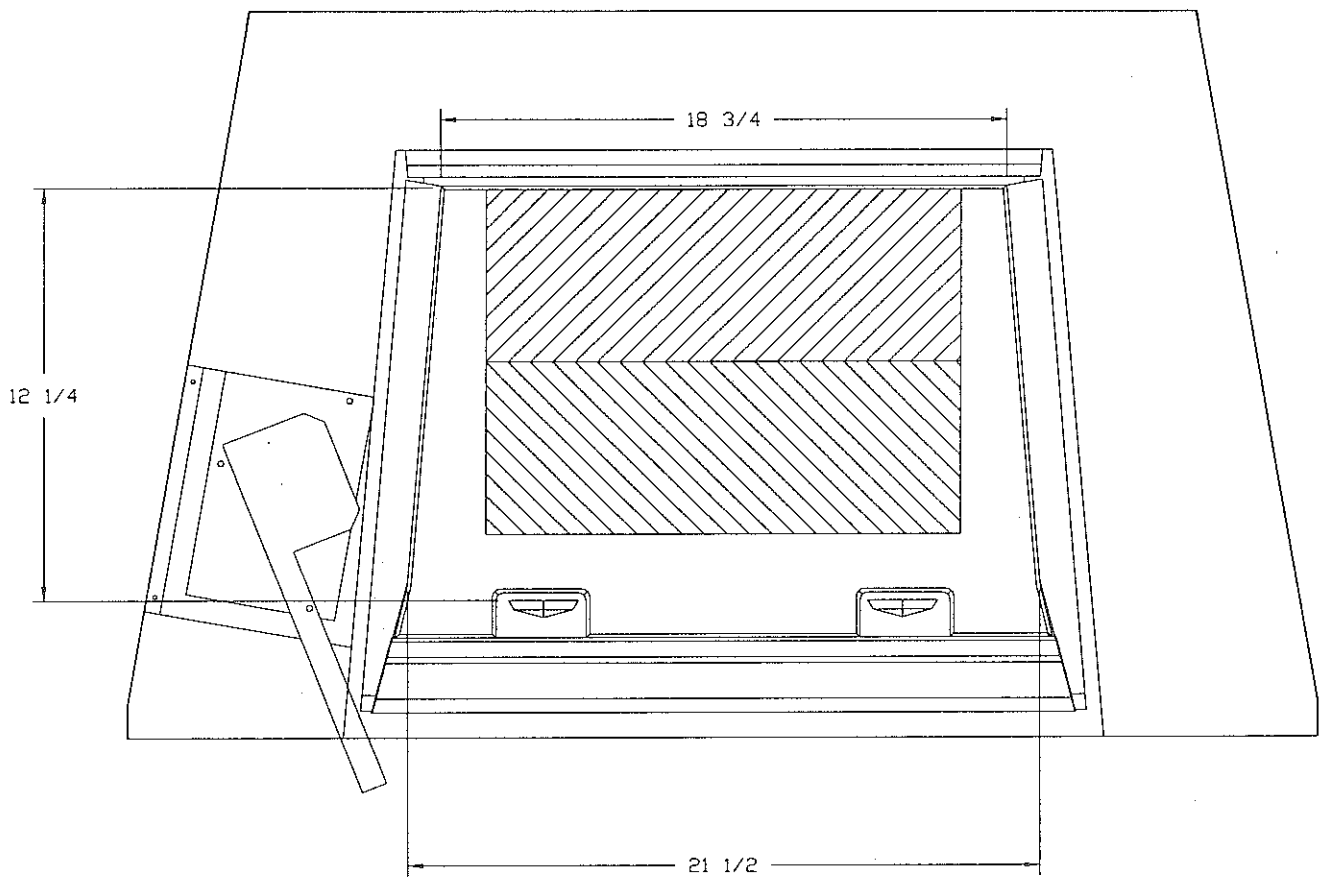
TOLERANCES GENERALES
FRACT. ± N/A | X.XXX ± N/A
X.XX ± N/A | ANGLE ± N/A

NOM/NAME: OUTSIDE DIMENSIONS BIS VISTA

REVISION:
DESSIN/DWG: BIS VISTA

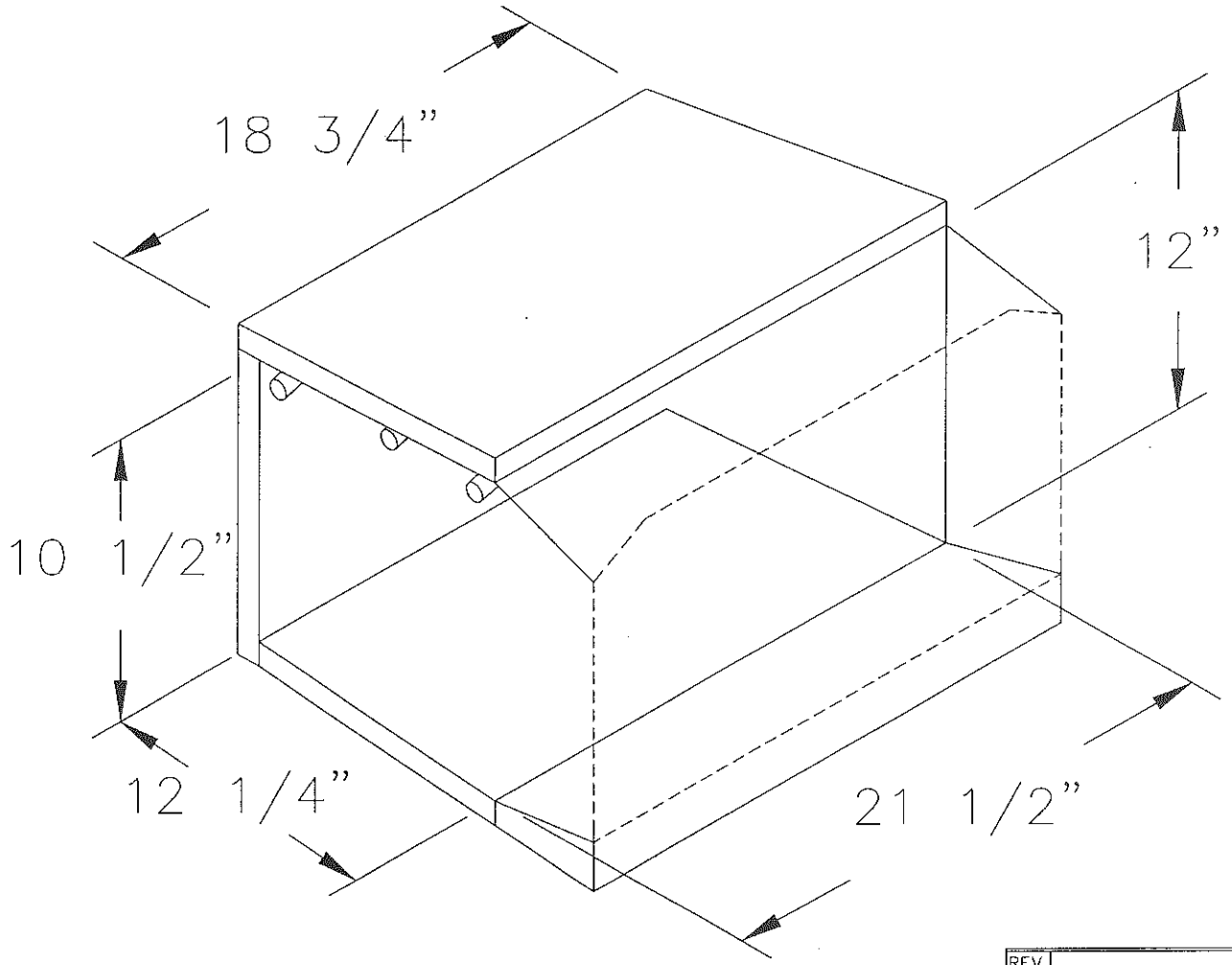


REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: F. BÉRARD		
DATE: AUGUST 01, 01	TOLERANCES GENERALES	
ECH./SCALE: 3/16" = 1"	FRACT. ± 1/32" / X.XX ± 0.015" / X.XXX ± 0.005"	ANGLE ± 2°
VERIFIE/CHECKED:		
CODE: ---	NOM/NAME: SIDE VIEW (FIREBOX DIMENSIONS)	
PAGE: 1 of 1	REVISION:	DESSIN/DWG: BIS VISTA

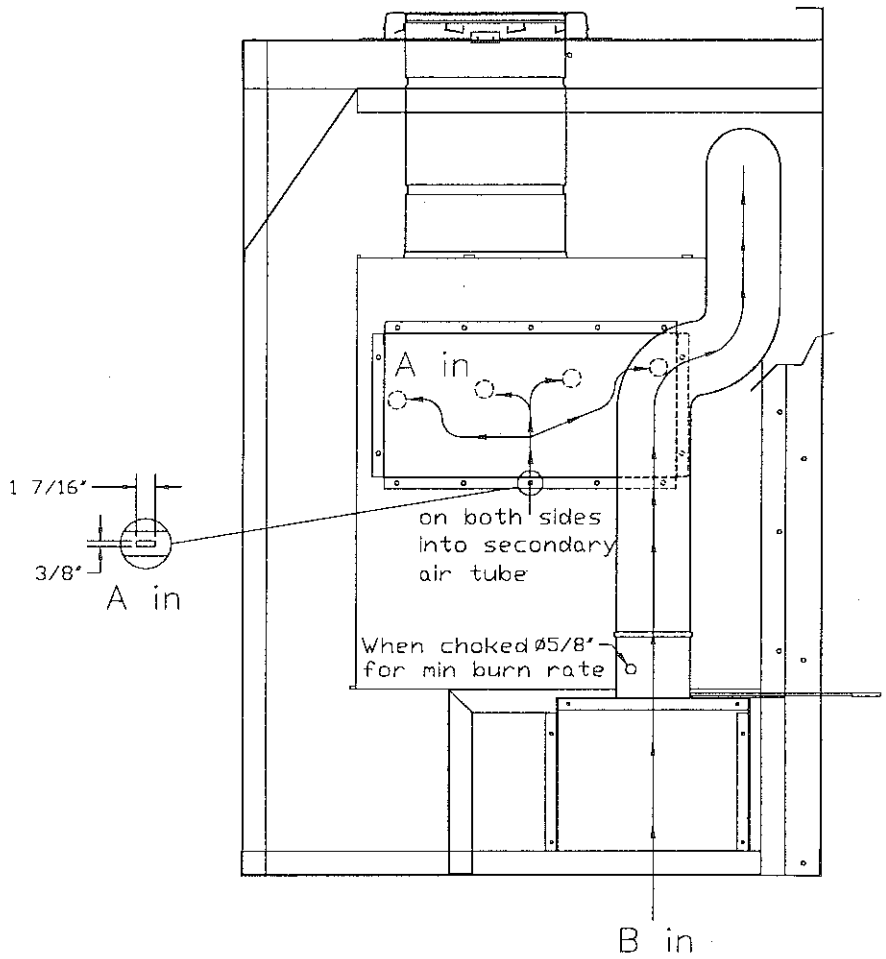


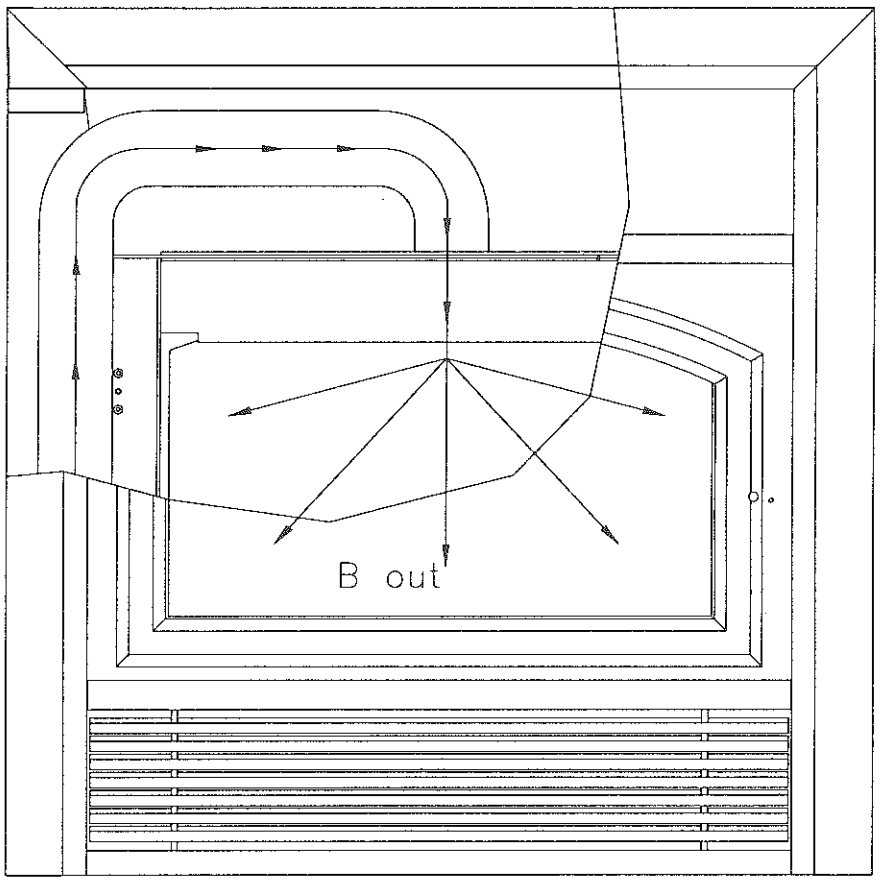
REV.	DESCRIPTION	DE:

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINE/DRAWN: F. BÉRARD	
DATE: AUGUST 01, 01	TOLERANCES GENERALES
ECH./SCALE: 3/16" = 1"	FRACT. ± 1/32" ANGLE ± 2°
VERIFIE/CHECKED:	X.XX ± 0.015"
	X.XXX ± 0.005"
CODE: ---	NOM/NAME: TOP VIEW (FIREBOX DIMENSIONS)
PAGE: 1 of 1	REVISION / DESSIN/DWG: BIS VISTA

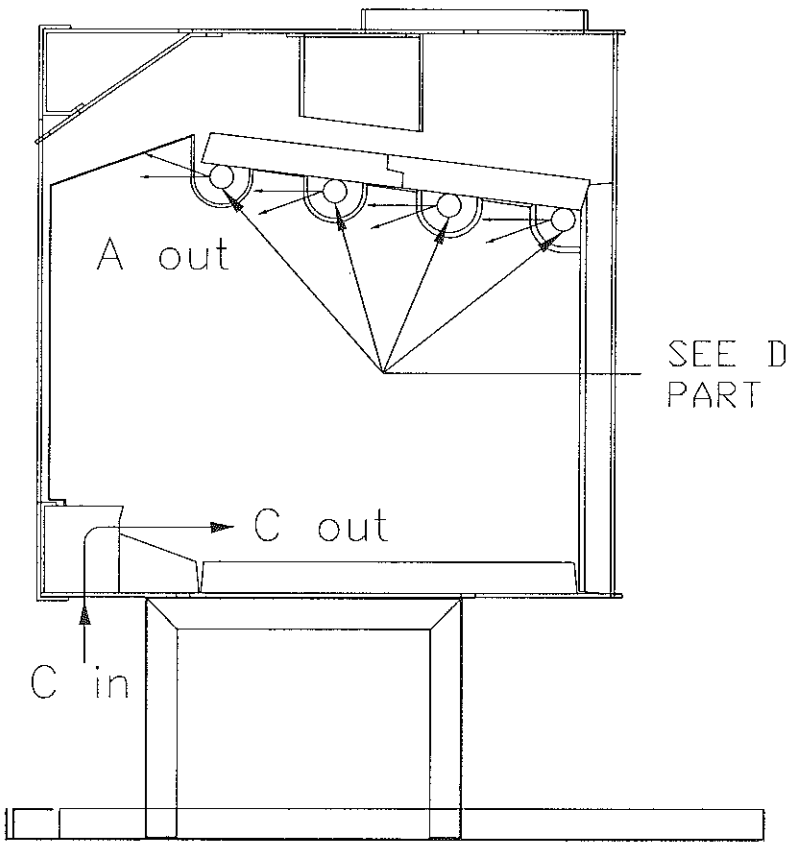


REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: F. BÉRARD		
DATE: AUGUST 01, 01	TOLERANCES GENERALES	
ECH./SCALE: 3/16" = 1"	FRACT. ± 1/32" | ANGLE ± 2° X.XX ± 0.015" X.XXX ± 0.005"	
VERIFIE/CHECKED:		
CODE: ---	NOM/NAME: FIREBOX DIMENSIONS	
PAGE: 1 of 1	REVISION:	DESSIN/DWG: BIS VISTA





REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD	TOLERANCES GENERALES	
DATE: 26/11/01	FRACT. ± 1/32" ANGLE ± 2'	
ECH./SCALE	X.XX ± 0.015"	
VERIFIÉ/CHECKED	X.XXX ± 0.005"	
CODE	NOM/NAME: AIR CHANELS	
PAGE: 1 de 1	REVISION: #	DESSIN/DWG



SEE DRAWING 1994 FOR THE TUBES
PART NUMBER SR1994B

REV.	DESCRIPTION	DE:

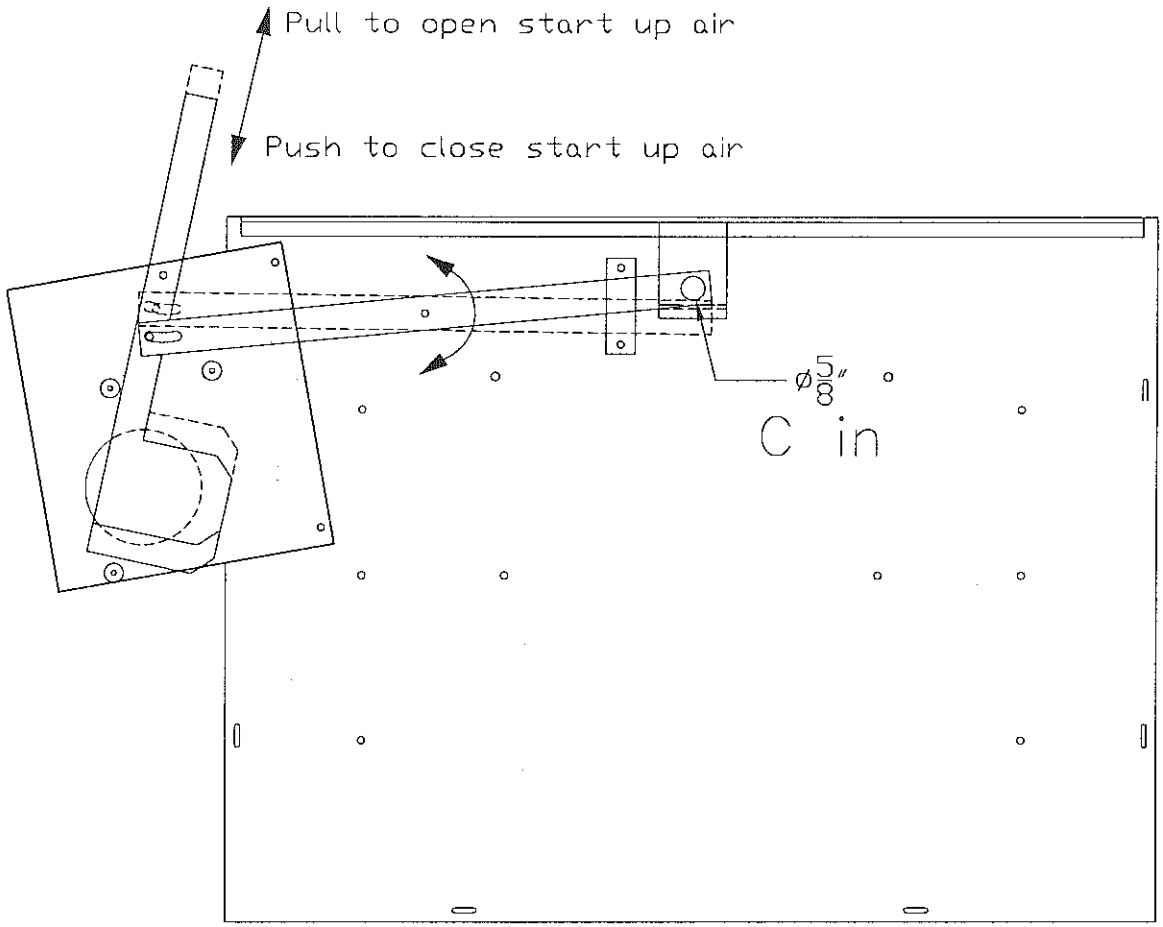
CONCU/DESIGNED: E. LAMY
DESSINÉ/DRAWN: F. BÉRARD
DATE: AUGUST 01, 01
ECH./SCALE: 3/16" = 1"
VERIFIÉ/CHECKED:
CODE: ---
PAGE: 1 of 1

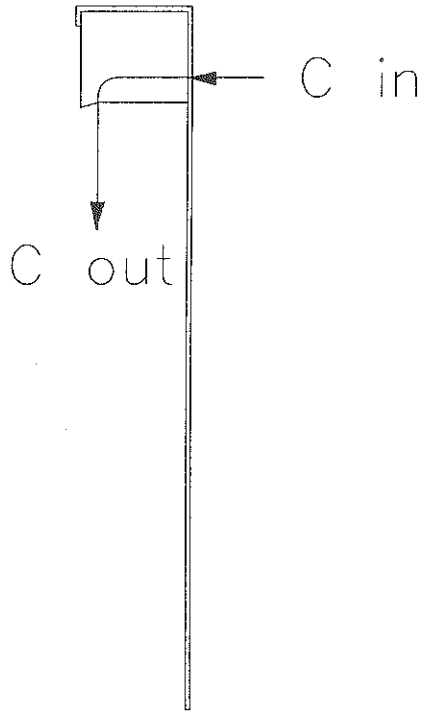
SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES

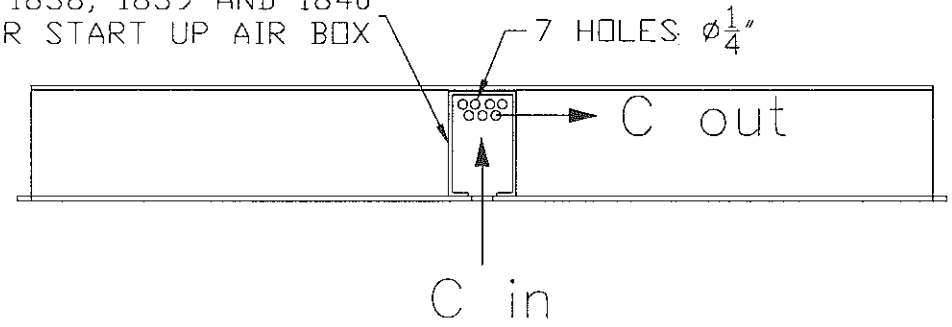
FRACT. ± 1/32" | ANGLE ± 2°
X.XX ± 0.015"
X.XXX ± 0.005"

NOM/NAME: TUBES AIR FLOW DIRECTION
REVISION:
DESSIN/DWG: BIS VISTA



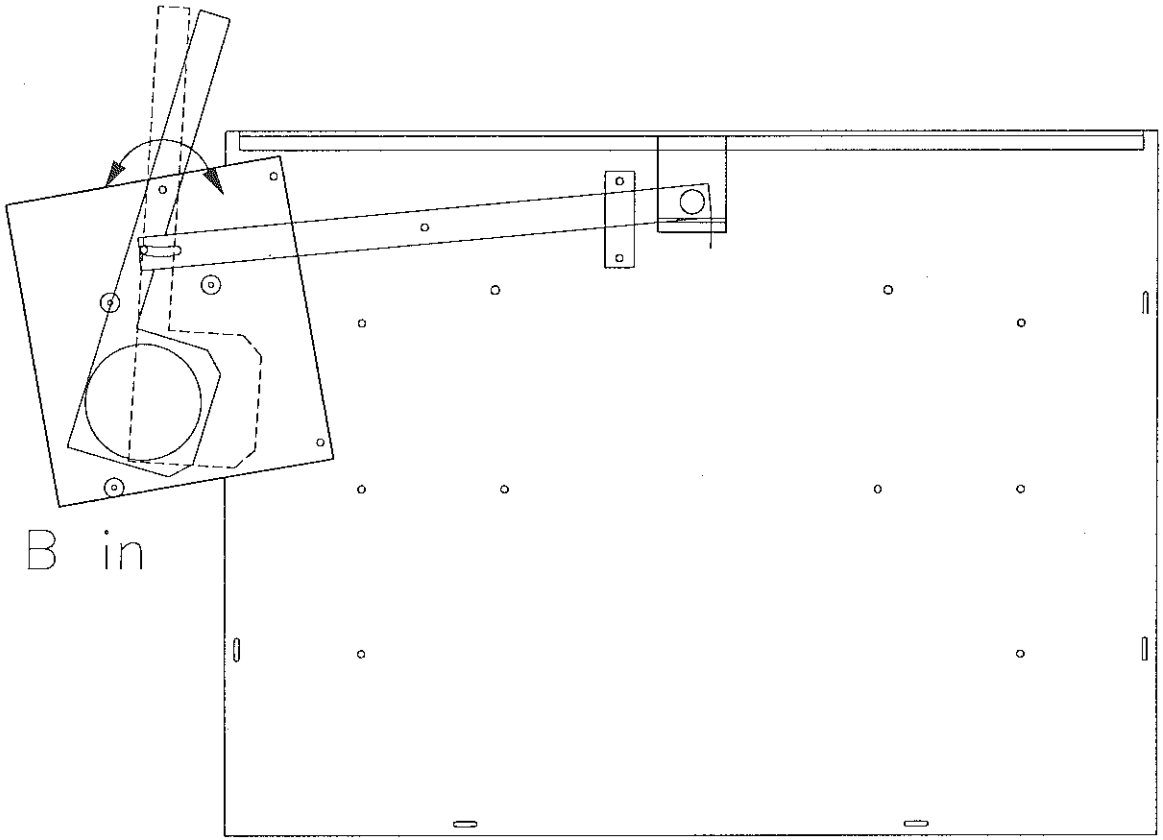


SEE DRAWINGS 1838, 1839 AND 1840
FOR START UP AIR BOX

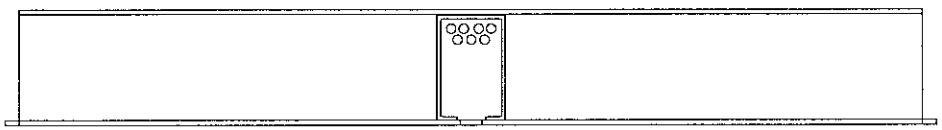


REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD	TOLERANCES GENERALES	
DATE: 26/11/01	FRACT. ± 1/32"	ANGLE ± 2°
ECH./SCALE	X.XX ± 0.015"	
VERIFIÉ/CHECKED	X.XXX ± 0.005"	
CODE	NOM/NAME: START UP AIR CONTROL	
PAGE: 1 de 1	REVISION: #	DESSIN/DWG: BIS VISTA

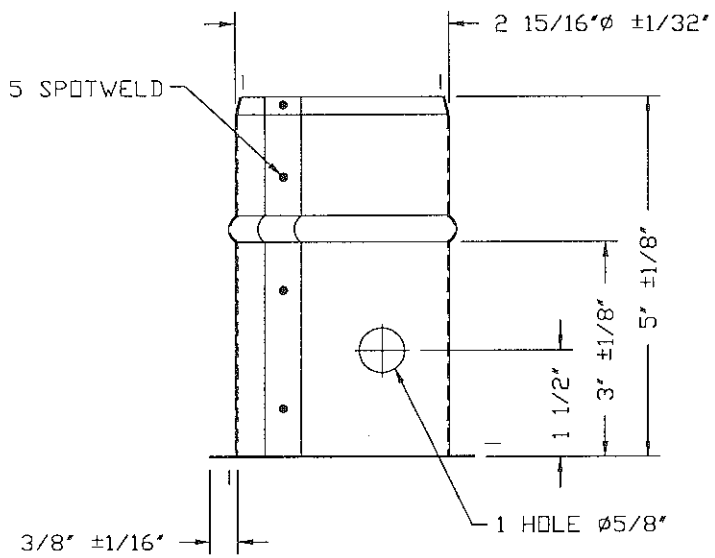
Rotate to open or close primary air

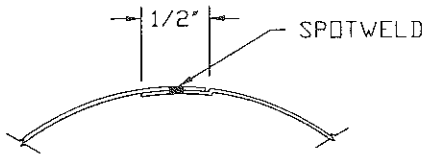




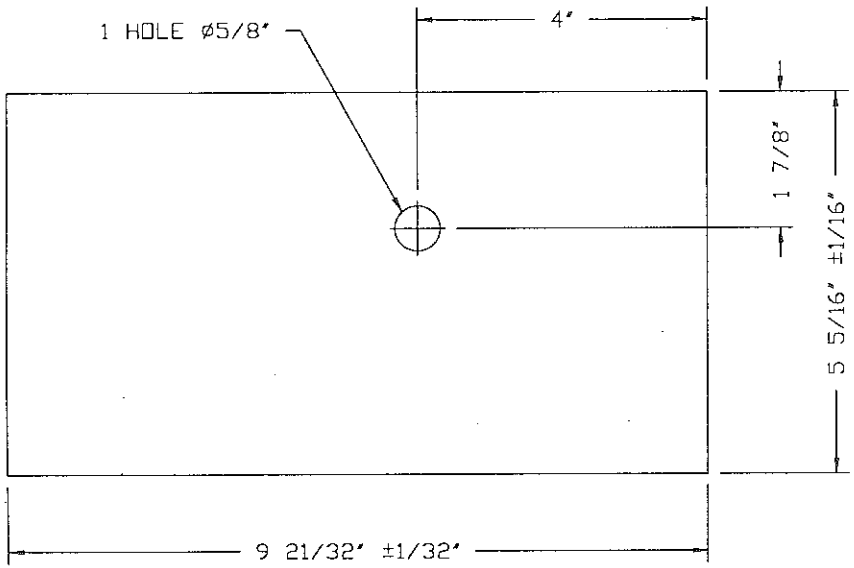


REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD		
DATE: 26/11/01	TOLERANCES GENERALES	
ECH./SCALE:	FRACT. ± 1/32" X.XX ± 0.015" X.XXX ± 0.005"	ANGLE ± 2°
VERIFIÉ/CHECKED:		
CODE:	NOM/NAME: PRIMARY AIR CONTROL	
PAGE: 1 de 1	REVISION: #	DESSIN/DWG: BIS VISTA





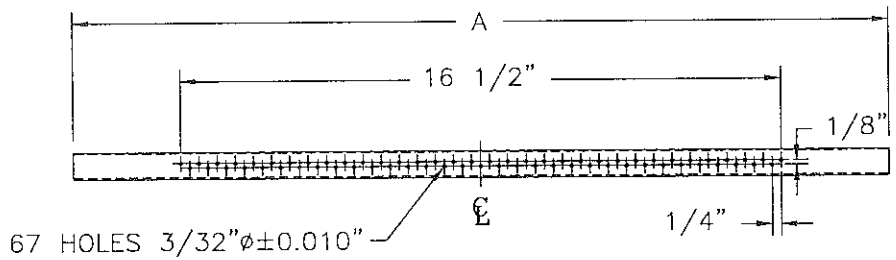
SIMPLE OVERLAP



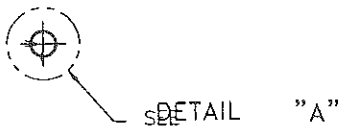
UNFOLD

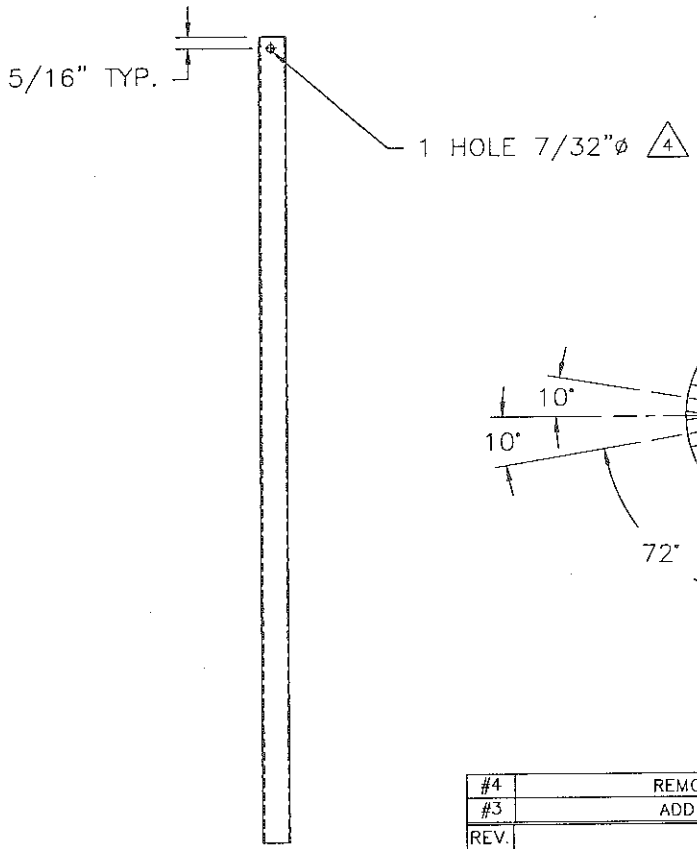
MATERIAL: SATIN COAT 0.018"

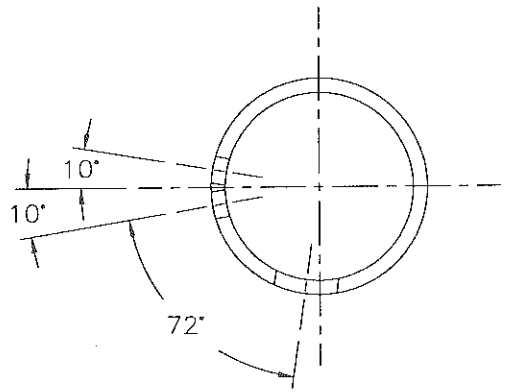
REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. DUFOUR	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD	TOLERANCES GENERALES	
DATE: MAY 6, 99	FRACT. ± 1/32" X.XX ± 0.015" X.XXX ± 0.005"	ANGLE ±2°
ECH./SCALE: 3/8" = 1"		
VERIFIE/CHECKED:		
CODE: SR1958	NOM/NAME: AIR ENTRY PIPE	
PAGE: 1 of 2	REVISION:	DESSIN/DWG: 1958



MODEL	DIMENSIONS
	A ±1/16"
SR1994A	22 7/16"
* SR1994B	23 7/8"
SR1994C	24 11/16"





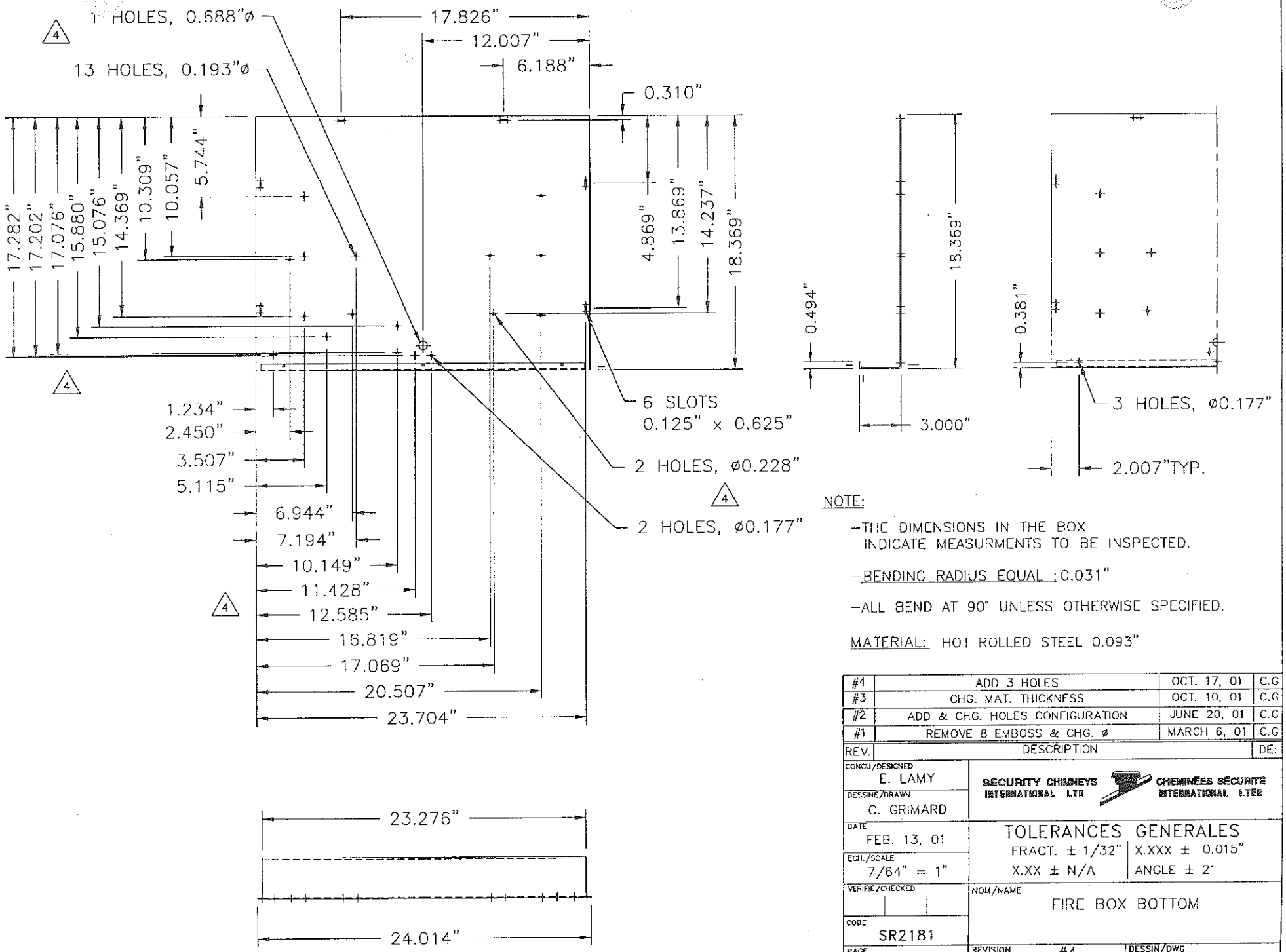


DETAIL "A"

MATERIEL:
- -TUBE 3/4"ø EXT. STRUCTURAL
- -INOX. STEEL 304 0.049" (18 GAGE)

REV.	DESCRIPTION	DATE	DE:
#4	REMOVE 1 HOLES	MAY 11, 01	C.G
#3	ADD TOLERENCE	APRIL 21, 01	MC

CONCU/DESIGNED: E. DUFOUR	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINE/DRAWN: M. CHAURETTE	
DATE:	TOLERANCES GENERALES
ECH./SCALE: 3/16" = 1"	FRACT. ± 1/32" X.XX ± 0.015" X.XXX ± 0.005" ANGLE ±2°
VERIFIE/CHECKED:	
CODE: SR1994	NOM/NAME: SEC. AIR TUBE 3/4" DIA
PAGE: 1 1	REVISION: #4 DESSIN/DWG: 1994



NOTE:

-THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.

-BENDING RADIUS EQUAL : 0.031"

-ALL BEND AT 90° UNLESS OTHERWISE SPECIFIED.

MATERIAL: HOT ROLLED STEEL 0.093"

REV.	DESCRIPTION	DATE	DE:
#4	ADD 3 HOLES	OCT. 17, 01	C.G
#3	CHG. MAT. THICKNESS	OCT. 10, 01	C.G
#2	ADD & CHG. HOLES CONFIGURATION	JUNE 20, 01	C.G
#1	REMOVE 8 EMBOSS & CHG. ø	MARCH 6, 01	C.G

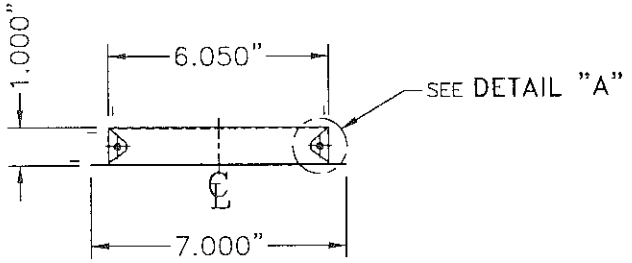
CONCU/DESIGNED: E. LAMY
DESSINÉ/DRAWN: C. GRIMARD
DATE: FEB. 13, 01
ECH./SCALE: 7/64" = 1"
VERIFIÉ/CHECKED:
CODE: SR2181
PAGE: 1 of 2

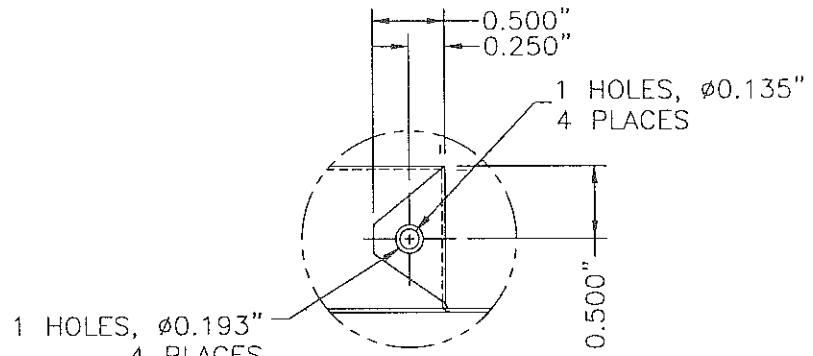
SECURITY CHIMNEYS INTERNATIONAL LTD
CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.015"
X.XX ± N/A | ANGLE ± 2°

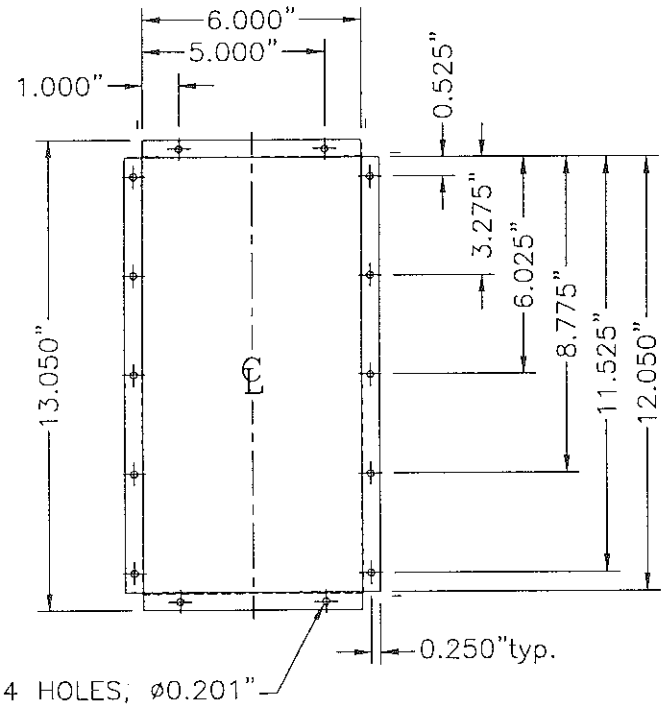
NOM/NAME: FIRE BOX BOTTOM

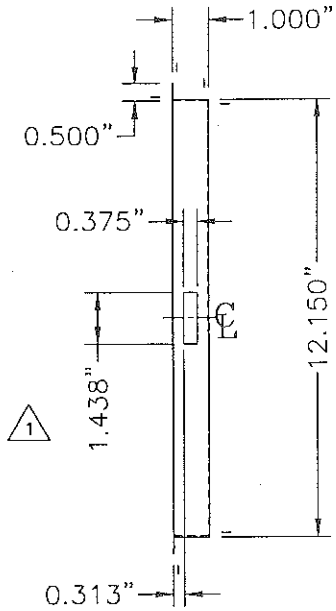
REVISION: #4
DESSIN/DWG: PROTO 2181





DETAIL "A"
ZOOM 4X





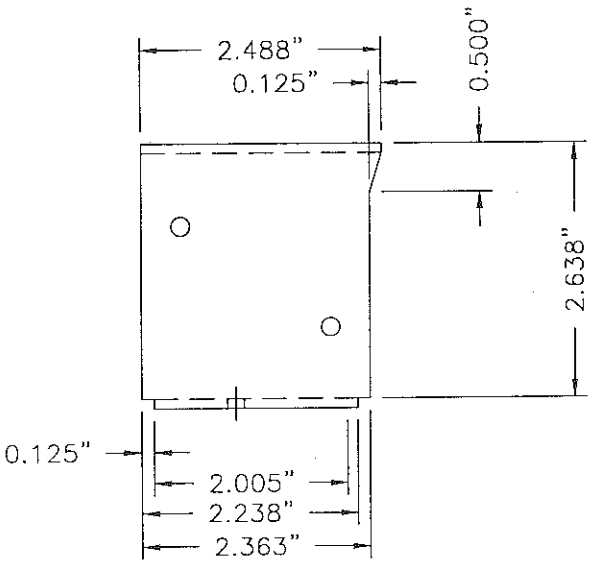
NOTE:
- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.

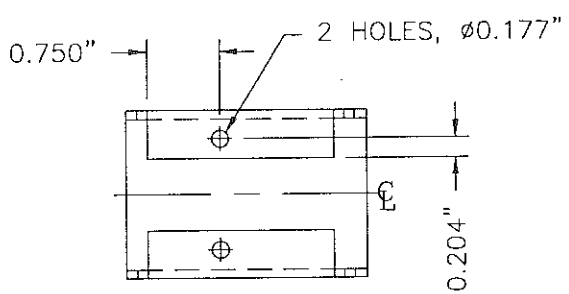
- BENDING RADIUS EQUAL : 0.031"

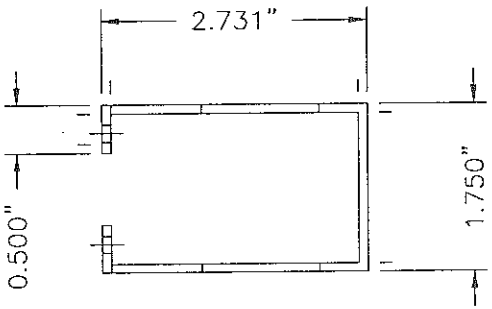
MATERIAL: SATIN COAT 0.025"

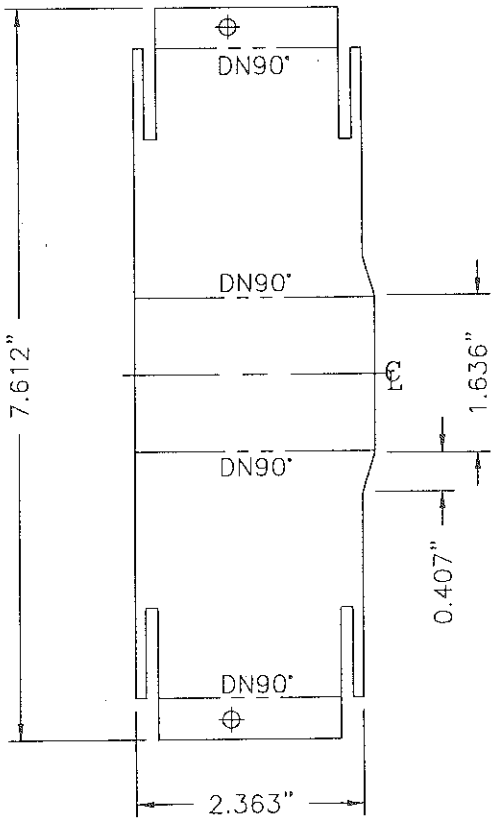
#1	CHG. DIM. FOR SLOT & HOLES ø	NOV. 26, 01	C.G
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINÉ/DRAWN: C. GRIMARD	
DATE: FEB. 16, 01	TOLERANCES GENERALES: FRACT. ± 1/32" | X.XXX ± 0.015"
ECH./SCALE: 3/16" = 1"	X.XX ± N/A | ANGLE ± 2°
VERIFIÉ/CHECKED:	NOM/NAME: SECONDARY AIR BOX
CODE: SR2193	
PAGE: 1 of 2	REVISION: #1 | DESSIN/DWG: PROTO 2193









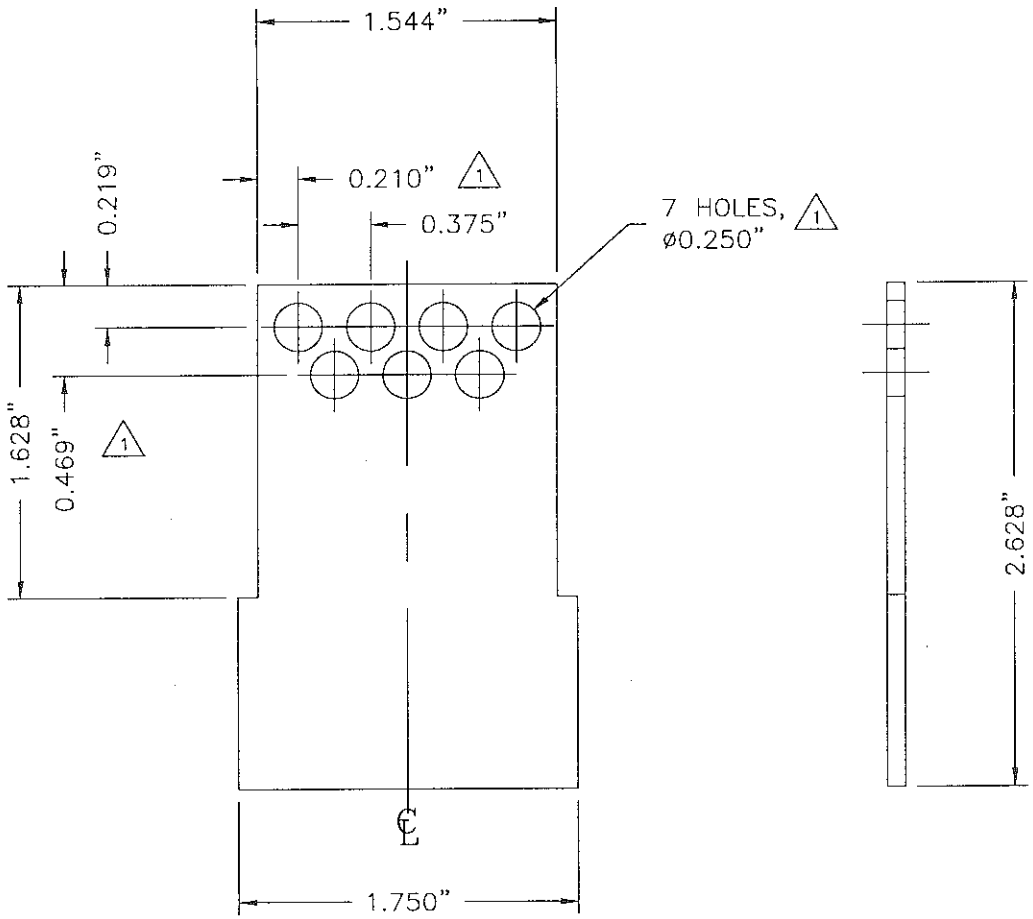
BEND:

NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- ALL BEND AT 90° UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: HOT ROLLED STEEL 0.093"

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD		
DATE: OCT. 5, 01	TOLERANCES GENERALES: FRACT. ± 1/32" X.XXX ± 0.015" X.XX ± N/A ANGLE ± 2°	
ECH./SCALE: 5/8" = 1"		
VERIFIÉ/CHECKED:	NOM/NAME: START UP AIR BOX CONTOUR	
CODE: SR2238		
PAGE: 1 of 2	REVISION:	DESSIN/DWG: PROTO 2238



NOTE:
—PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.

MATERIAL: HOT ROLLED STEEL 0.093"

#1	CHG. HOLES POSITION & ø	OCT. 17, 01	C.G
REV.	DESCRIPTION		DE:

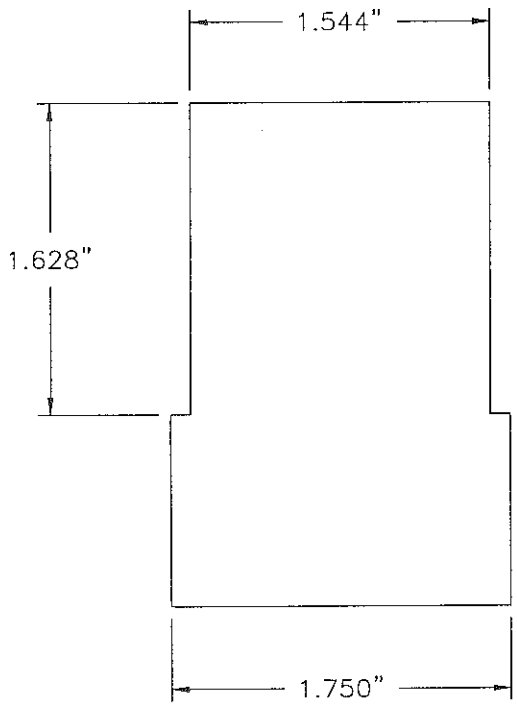
CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: OCT. 5, 01
ECH./SCALE: 1" = 1"
VERIFIE/CHECKED:
CODE: SR2239
PAGE: 1 of 1

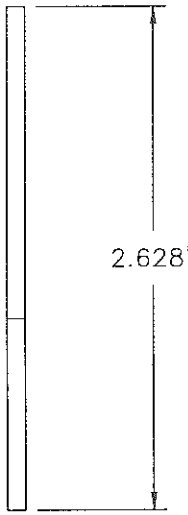
SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.015"
X.XX ± N/A | ANGLE ± 2°

NOM/NAME: START UP AIR FRONT BOX

REVISION: #1
DESSIN/DWG: PROTO 2239





MATERIAL: HOT ROLLED STEEL 0.093"

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD		
DATE: OCT. 5, 01	TOLERANCES GENERALES	
ECH./SCALE: 1" = 1"	FRACT. ± 1/32" X.XXX ± 0.015"	
VERIFIÉ/CHECKED:	X.XX ± N/A ANGLE ± 2°	
NOM/NAME: STAT UP AIR BACK BOX		
CODE: SR2240		
PAGE: 1 of 1	REVISION	DESSIN/DWG: PROTO 2240

PORTES BIS VISTA

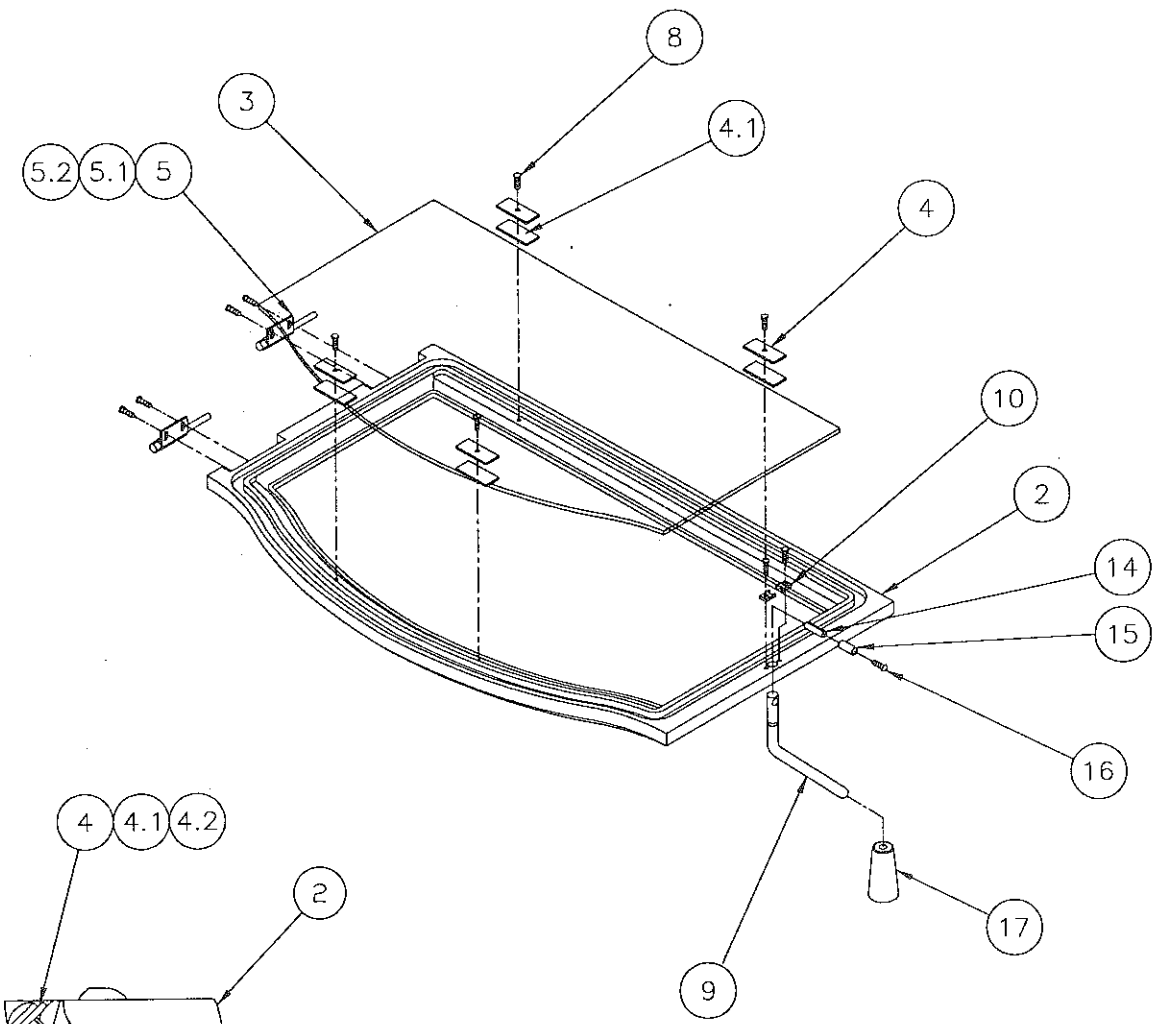
CHEMINÉES SÉCURITÉ LTÉE

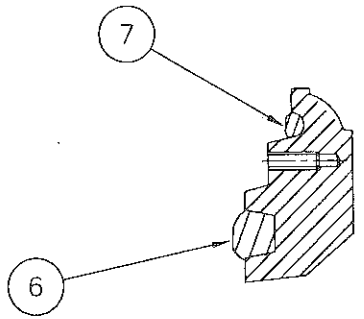
BISVISTAPORTES

revision #

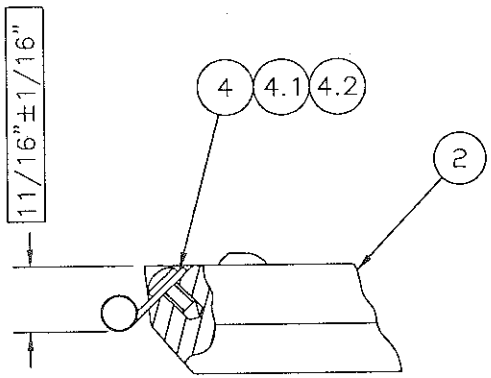
26-nov-01

BL	BVCBK	BVCG	BVVBK	BVVG	DESCRIPTION	DRAWING	CODE	ASS.
1	1	1	1	1	BIS VISTA DOOR ASSEMBLY	2267	SR2267	
2	1				CONTEMPORARY DOOR	2221	SR2221N	
		1			CONTEMPORARY DOOR	2221	SR2221OR	
			1		VICTORIAN DOOR	2226	SR2226N	
				1	VICTORIAN DOOR	2226	SR2226OR	
3	1	1			CONTEMPORARTY CERAMIC GLASS	2222	SR2222	
			1	1	VICTORIAN CERAMIC GLASS	2230	SR2230	
4	4	4	4	4	GLASS SUPPORT	1789	SR1789P	
4,1	4	4	4	4	GASKET	2180	SR2180	
5	2	2	2	2	HINGE ASSEMBLY (LEFT)	1933	SR1933	
5,1	2	2	2	2	HINGE	1801	SR1801	
5,2	2	2	2	2	HINGE PIN	1802	SR1802	
6	1	1	1	1	GASKETS	1823	SR1823G	
7	1	1	1	1	GASKETS	1823	SR1823H	
8	10	10	10	10	MECHANICAL SCREW 10-32 X 1/2"	VI233	VI233	
9	1	1	1	1	DOOR HANDLE SUPPORT	2268	SR2268	
10	2	2	2	2	DOOR HANDLE HOLDER	1805	SR1805	
11	1	1	1	1	DOOR PRTECTION FOAM	2269	BT2269G	
11,1	1	1	1	1	DOOR PRTECTION FOAM	2269	BT2269D	
12	0,2	0,2	0,2	0,2	SILICONE HI TEMP.	CASC-HT	CASC-HT	
13	1	1	1	1	DOOR CARDBOARD BOX	2270	BT2270	
14	1	1	1	1	SPRING PIN 1"LG X 1/4"Ø	B2SP1	B2SP1	
15	1	1	1	1	MACHINED PIPE	BIS204	B2ST2	
16	1	1	1	1	TEK SCREW #8-18 X 3/4"	VIT4	VIT4	
17	1	1	1	1	PHENOLIC DOOR HANDLE	POIGNE001	POIGNE001	
18	1	1	1	1	FRAGILE / CAUTION- STICKER	ETCS169	ETCS169	
19	1	1	1	1	LABEL "MADE IN CANADA"	ETCS184	ETCS184	
20	1	1	1	1	LABEL PRINT AT CSL-MODEL/INFO	ETCODE16	ETCODE16	
21	1	1	1	1	EPA RATING LABEL	NP249	NP249	
22	1	1	1	1	DOOR INSTALLATION INSTRUCTIONS	F126	F126	



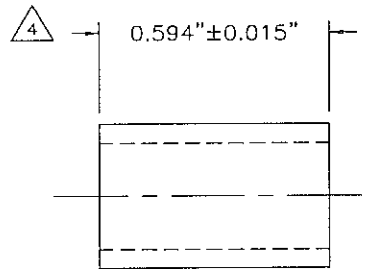


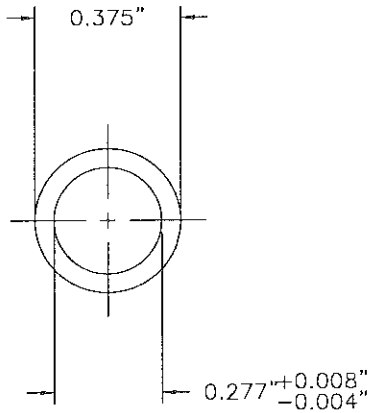
SECTION "A–A"
ZOOM 4X



HINGE POSITION

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: B. DUPUIS		
DATE: 11–26–2001	TOLERANCES GENERALES	
ECH./SCALE: 1/8" = 1"	FRACT. ± 1/32" X.XX ± 0.015" X.XXX ± 0.005" — ANGLE ± 2°	
VERIFIE/CHECKED:		
CODE: SR2267	NOM/NAME: VISTA DOOR ASSEMBLY	
PAGE: 1 of 1	REVISION:	DESSIN/DWG: 2267





#4	ADDE TOLERANCE	NOV. 22, 99	C.G
REV.	DESCRIPTION	DATE	DE:

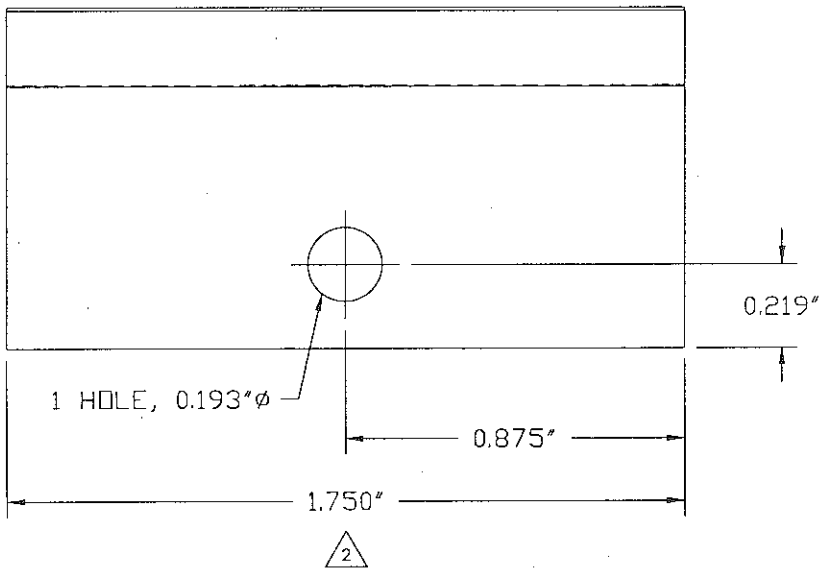
CONCU/DESIGNED: L. SANSCARTIER
DESSINE/DRAWN: P. GORRY
DATE: NOV. 30, 1994
ECH./SCALE: 2" = 1"
TOLERANCES: FRACT. ± 1/32" .XX ± 0.015" .XXX ± 0.005" ANGLE ± 0.5°
VERIFIE/CHECKED:

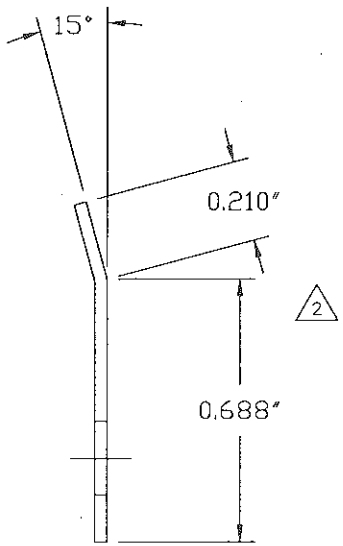
SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE

NOM/NAME: MACHINED PIPE

CODE: B2ST2
REVISION: #4
PAGE: 1 of 1
DESSIN/DWG: BIS204

MATERIAL: HOT ROLLED OU COLD ROLLED





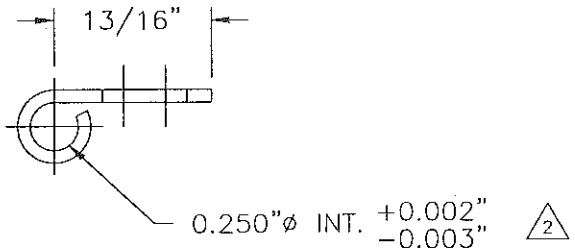
NOTE:

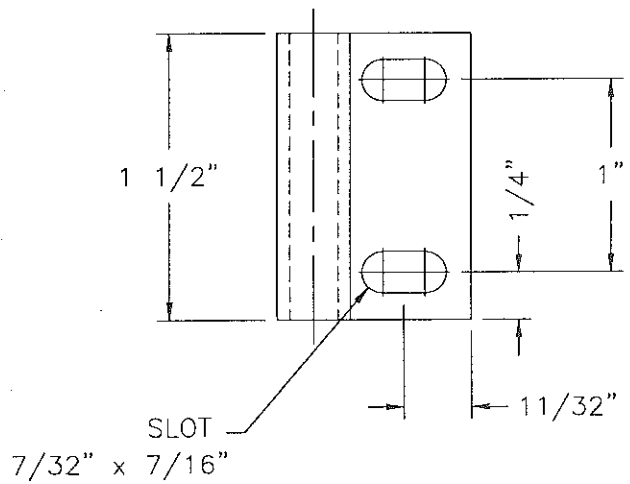
- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: SATIN COAT 0.032" (2)

REV.	DESCRIPTION	DE:
#2	CHG. DIMENSION & MATERIEL THICKNESS	MARCH 23, 00 C.G

CONCU/DESIGNED: L. PAGE	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: MARCH 11, 98	UNITE/UNITS: INCHES	TOLERANCES: GENERAL: FRACT. ± N/A; DEC. ± 0.015"; ANGLE ± 2° — HOLES: DIAM. ± 0.005"; LOC. ± 0.015"; C. EN C. ± N/A
ECH./SCALE: 2" = 1"		
VERIFIÉ/CHECKED:		
CODE:	NOM/NAME: GLASS SUPPORT	
PAGE: 1 of 1	REVISION: #2	DESSIN/DWG: 1789





MATERIAL: C.R.S 14GA.

#2	ADDED TOLERENCE	APRIL 10, 00	C.G
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: L. PAGE
DESSINE/DRAWN: C. GRIMARD
DATE: APRIL 15, 98
ECH./SCALE: 1" = 1"
VERIFIE/CHECKED:

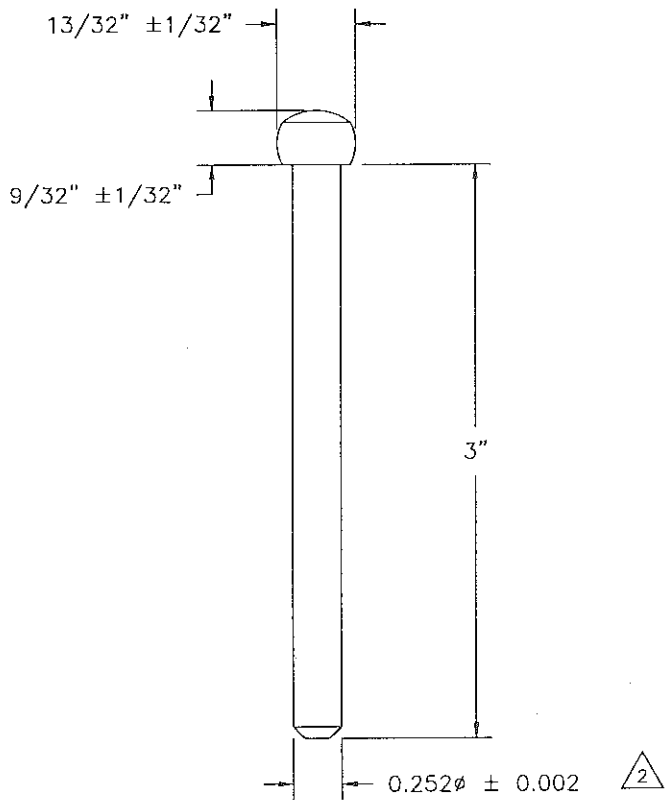
SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

UNITE/UNITS: INCHES

TOLERANCES:

GENERAL:	HOLES:
FRACT. ± 1/32"	DIAM. ± 1/32"
DEC. ± 0.005"	LOC. ± 1/32"
ANGLE ± 2°	C. EN C. ± 1/32"

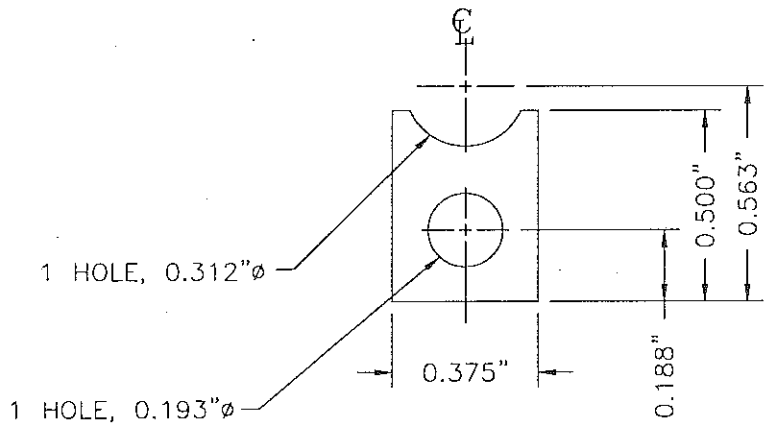
CODE:
NOM/NAME: HINGE
PAGE: 1 of 1
REVISION: #2
DESSIN/DWG: 1801



MATERIAL: COLD ROLLER STELL 0.250" +0.000" −0.002"

#2	CHG. TOLERANCE	NOV. 24, 99	E.L.
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: L. PAGE	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: APRIL 14, 98	UNITE/UNITS: INCHES	TOLERANCES: GENERAL: FRACT. ± 1/16" DEC. ± 0.005" ANGLE ± N/A; HOLES: DIAM. ± N/A LOC. ± N/A C. EN C. ± N/A
ECH./SCALE: 1" = 1"		
VERIFIE/CHECKED		
CODE	NOM/NAME: HINGE PIN	
PAGE: 1 of 1	REVISION: #2	DESSIN/DWG: 1802



NOTE:

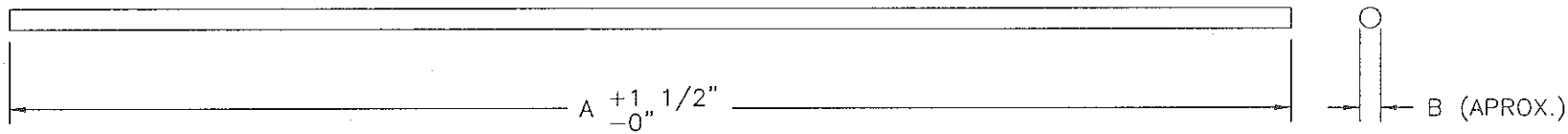
- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.

MATERIAL: HOT ROLLED STEEL 1/8"

#1		FEB. 26, 01	C.G
REV.	DESCRIPTION		DE:
CONCU/DESIGNED: L. PAGE	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE		
DESSINE/DRAWN: C. GRIMARD			
DATE: MAY 21, 98	UNITE/UNITS: INCHES	TOLERANCES: GENERAL: FRACT. ± N/A; DEC. ± 0.005"; ANGLE ± N/A	HOLES: DIAM. ± 0.005"; LOC. ± 0.005"; C. EN C. ± 0.005"
ECH./SCALE: 2" = 1"			
VERIFIE/CHECKED:			
CODE:	NOM/NAME: DOOR HANDLE HOLDER		
PAGE: 1 of 1	REVISION: #1	DESSIN/DWG: 1805	

CODE	A	B	MODELS FRO INDUSTRIES
SR1823A	40"	5/8"	TXP 020 GRAPHITE
SR1823B	52"	5/16"	TXP 050 GRAPHITE
SR1823C	27"	5/16"	TXP 050 GRAPHITE
SR1823D	92"	5/8"	TXP 020 GRAPHITE
SR1823E	83"	5/16"	TXP 050 GRAPHITE
SR1823F	1 3/4"	5/16"	TXP 050 GRAPHITE
SR1823G	73"	5/8"	TXP 020 GRAPHITE
SR1823H	69"	5/16"	TXP 050 GRAPHITE

△5



NOTE:

—THE END AS TO BE INTERLACE LIKE THIS. FOR SR1823A, SR1823D & SR1823G



MATERIAL: FIBERGLASS ROPE (3R)

REV.	DESCRIPTION	DE:
#5	ADD MODÈLES G & H	NOV. 22, 01 C.G
#4	ADD MODÈLES	DEC. 19, 00 C.G

CONCU/DESIGNED: G. LEBLANC
DESSINE/DRAWN: C. GRIMARD
DATE: MAY 22, 98
ECH./SCALE: 3/8" = 1"
VERIFIE/CHECKED:
CODE:
PAGE: 1 of 1

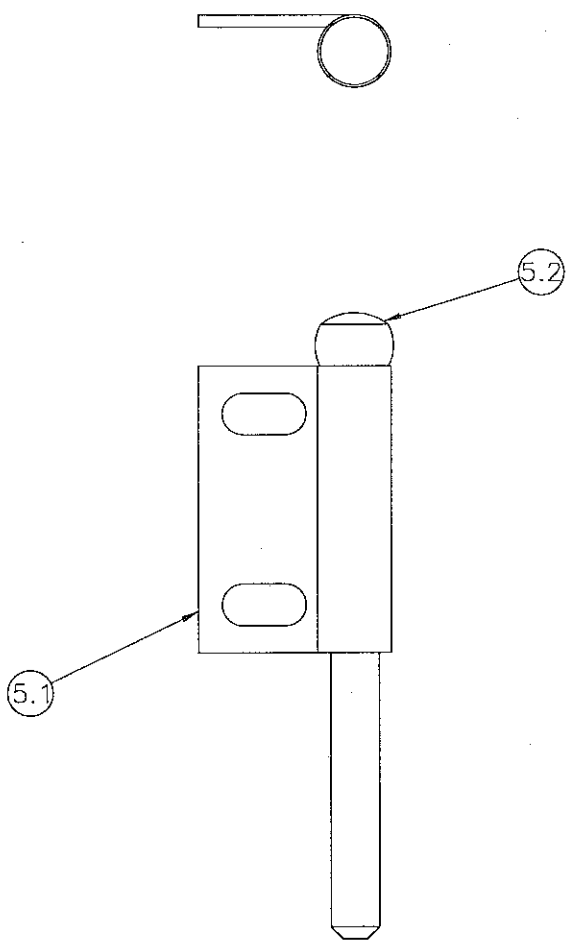
SECURITY CHIMNEYS INTERNATIONAL LTD — CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

UNITE/UNITS: INCHES

TOLERANCES:

GENERAL:	HOLES:
FRACT. ± N/A	DIAM. ± N/A
DEC. ± N/A	LOC. ± N/A
ANGLE ± N/A	C. EN C. ± N/A

NOM/NAME: GASKETS
REVISION: #5
DESSIN/DWG: 1823



REV.	DESCRIPTION	DE:

CONCU/DESIGNED: E. LAMY

DESSINE/DRAWN: C. GRIMARD

DATE: DEC 11, 98

ECH./SCALE: 1" = 1"

VERIFIE/CHECKED:

SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

UNITE/UNITS: INCHES

TOLERANCES:

GENERAL:	HOLES:
FRACT. ± N/A	DIAM. ± N/A
DEC. ± N/A	LOC. ± N/A
ANGLE ± N/A	C. EN C. ± N/A

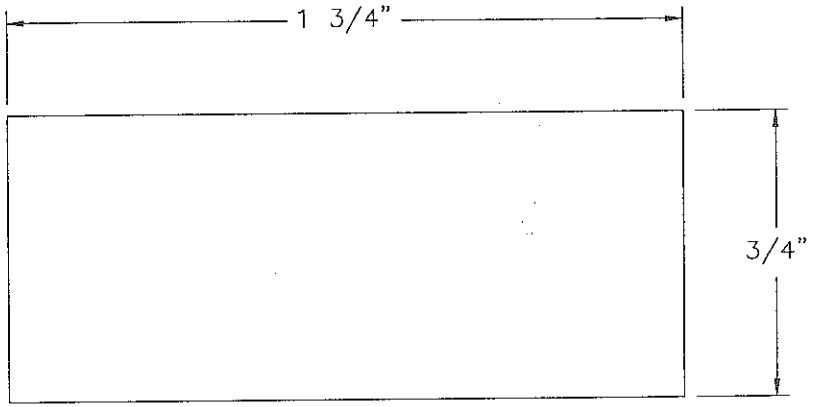
CODE:

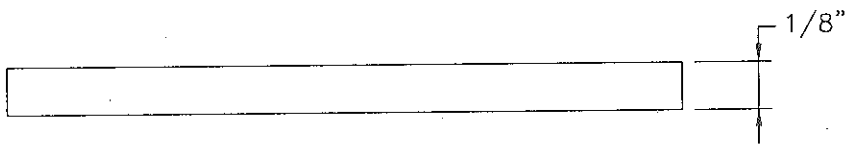
NOM/NAME: HINGE ASSEMBLY (LEFT)

PAGE: 1 of 1

REVISION:

DESSIN/DWG: 1933





MATERIAL: FIBER GLASS GASKET 1/8" x 3/4"
[TXP017 CODE 3R] GRAPHITE WITH ONE SIDE ADHESIVE.

REV.	DESCRIPTION	DE:

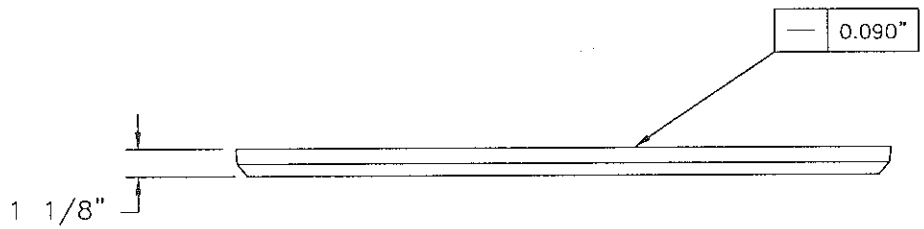
CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: JAN. 12, 01
ECH./SCALE: 2" = 1"
VERIFIE/CHECKED:
CODE: SR2180
PAGE: 1 of 1

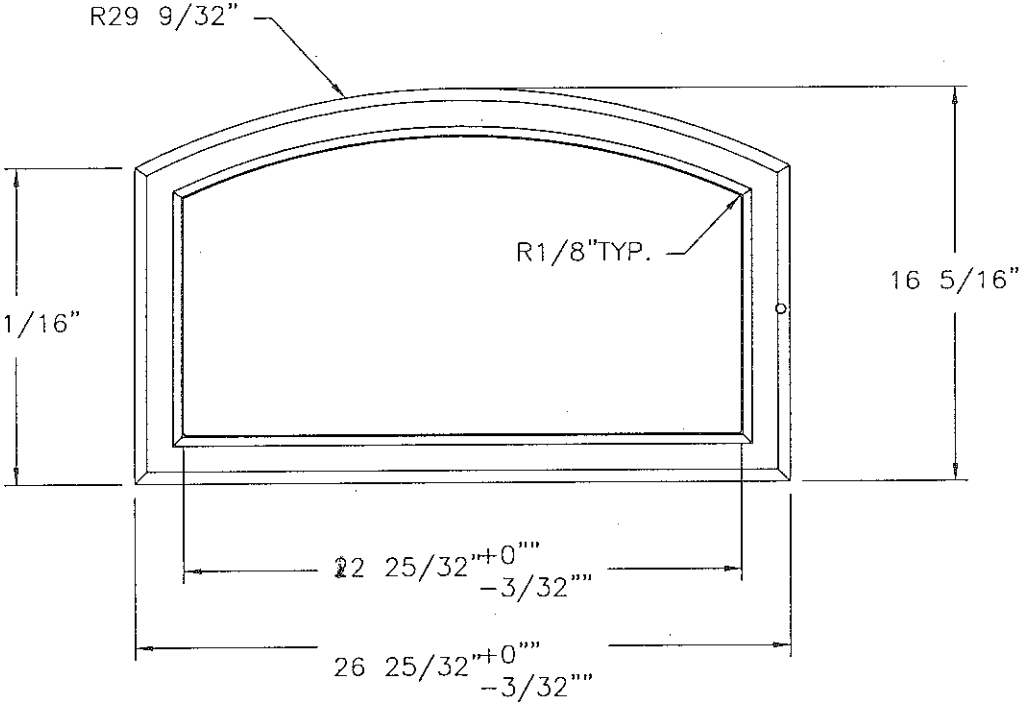
SECURITY CHIMNEYS INTERNATIONAL LTD
CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

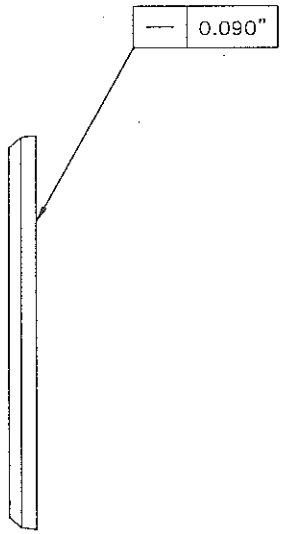
TOLERANCES GENERALES
FRACT. ± 1/16" | X.XXX ± N/A
X.XX ± N/A | ANGLE ± 2°

NOM/NAME: GLASS SUPPORT GASKET

REVISION:
DESSIN/DWG: 2180



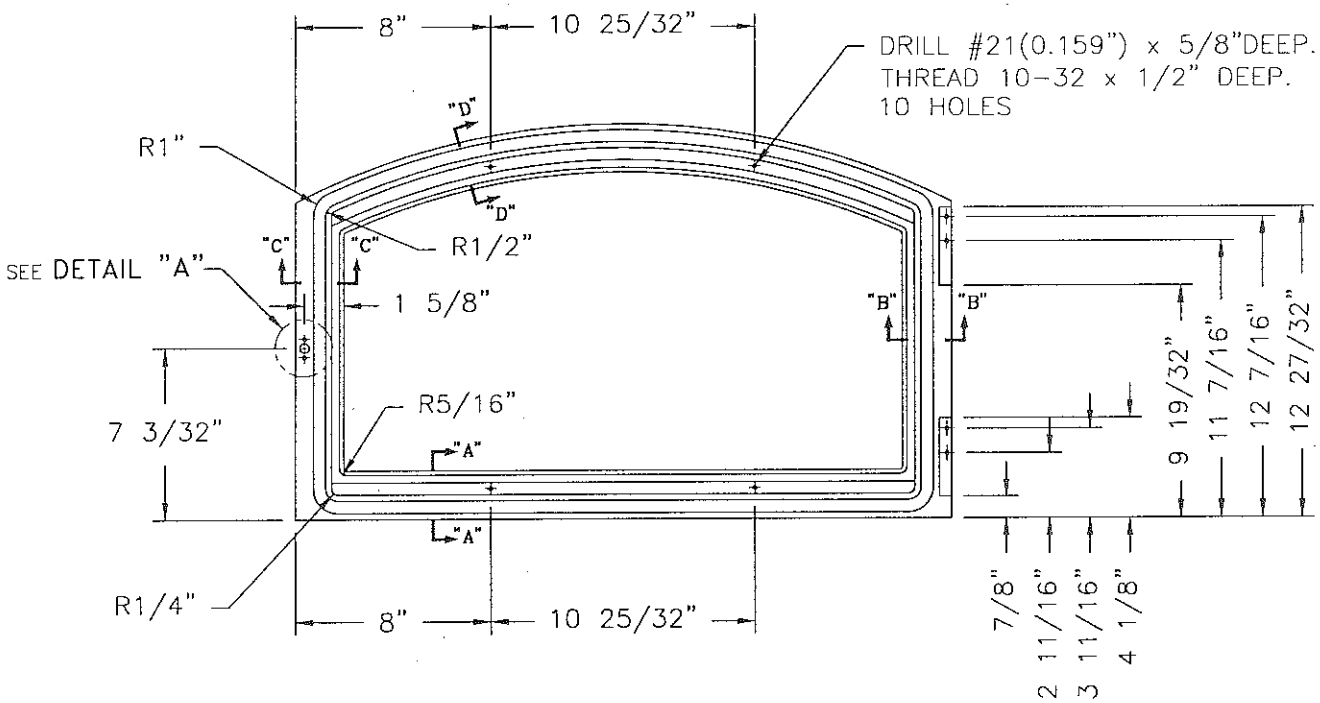


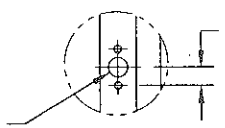


NOTE:
- FOR BACKSIDE VIEW SEE DRAWING 2221-1
- FOR SECTIONS DETAILS SEE DRAWING 2221-2

MATERIAL: GREY IRON, CLASSE 30, ASTM A48 TENSION MIN. 30.000 POUNDS

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: JUNE 19, 01	TOLERANCES GENERALES: FRACT. ± 1/32" X.XXX ± 0.005" X.XX ± 0.015" ANGLE ± 2°	
ECH./SCALE: 1/8" = 1"		
VERIFIE/CHECKED:	NOM/NAME: CONTEMPORARY DOOR	
CODE: SR2221		
PAGE: 1 of 3	REVISION:	DESSIN/DWG: PROTO 2221



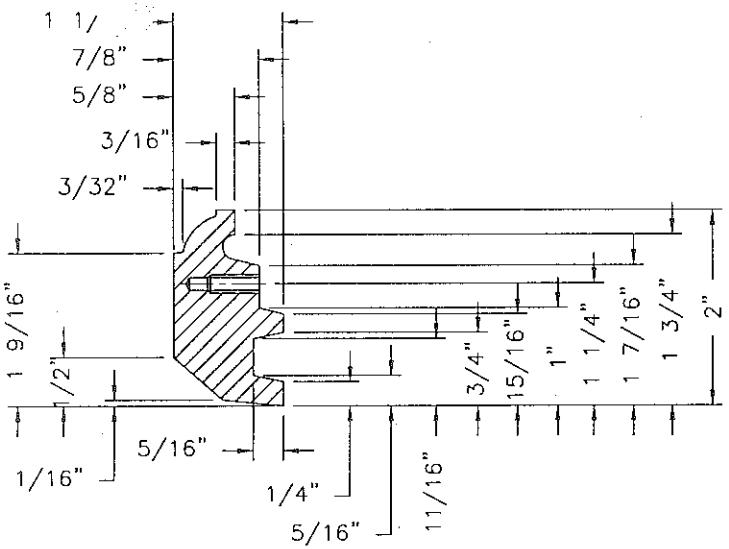


DETAIL "A"
ZOOM 2X

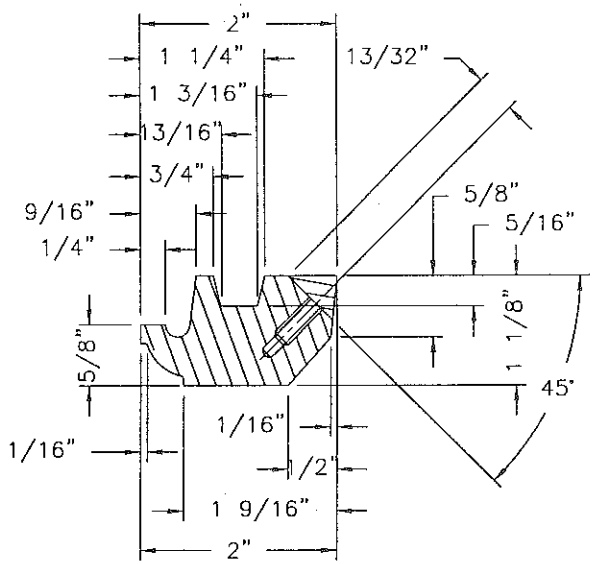
NOTE:
- SEE DRAWING 560-3 FOR SECTION DETAILS

MATERIAL: GREY IRON, CLASSE 30, ASTM A48 TENSION MIN. 30.000 POUNDS

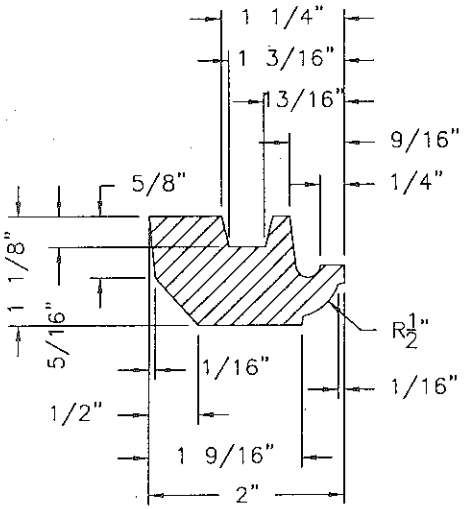
REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: JUNE 19, 01	TOLERANCES GENERALES: FRACT. ± 1/32" | X.XXX ± 0.005"	
ECH./SCALE: 1/8" = 1"	X.XX ± 0.015" | ANGLE ± 2°	
VERIFIE/CHECKED:	NOM/NAME: CONTEMPORARY DOOR	
CODE: SR2221		
PAGE: 2 of 3	REVISION:	DESSIN/DWG: PROTO 2221-1



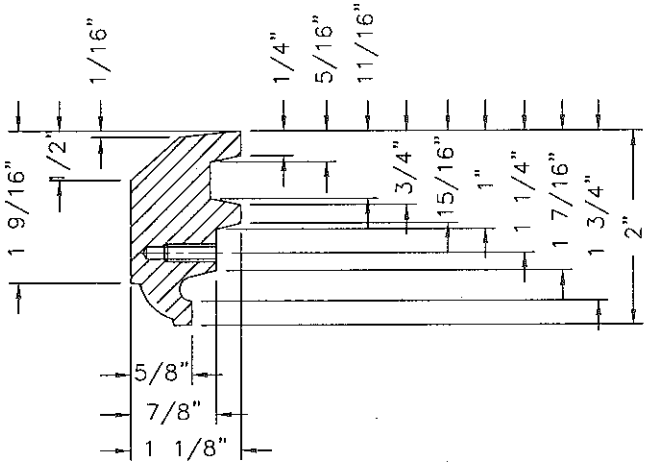
SECTION "A–A"
ZOOM 4X



SECTION "B–B"
ZOOM 4X



SECTION "C–C"
ZOOM 4X



SECTION "D–D"
ZOOM 4X

#1	CHANGE PROFILE	07–16–01	E.L.
REV.	DESCRIPTION		DE:

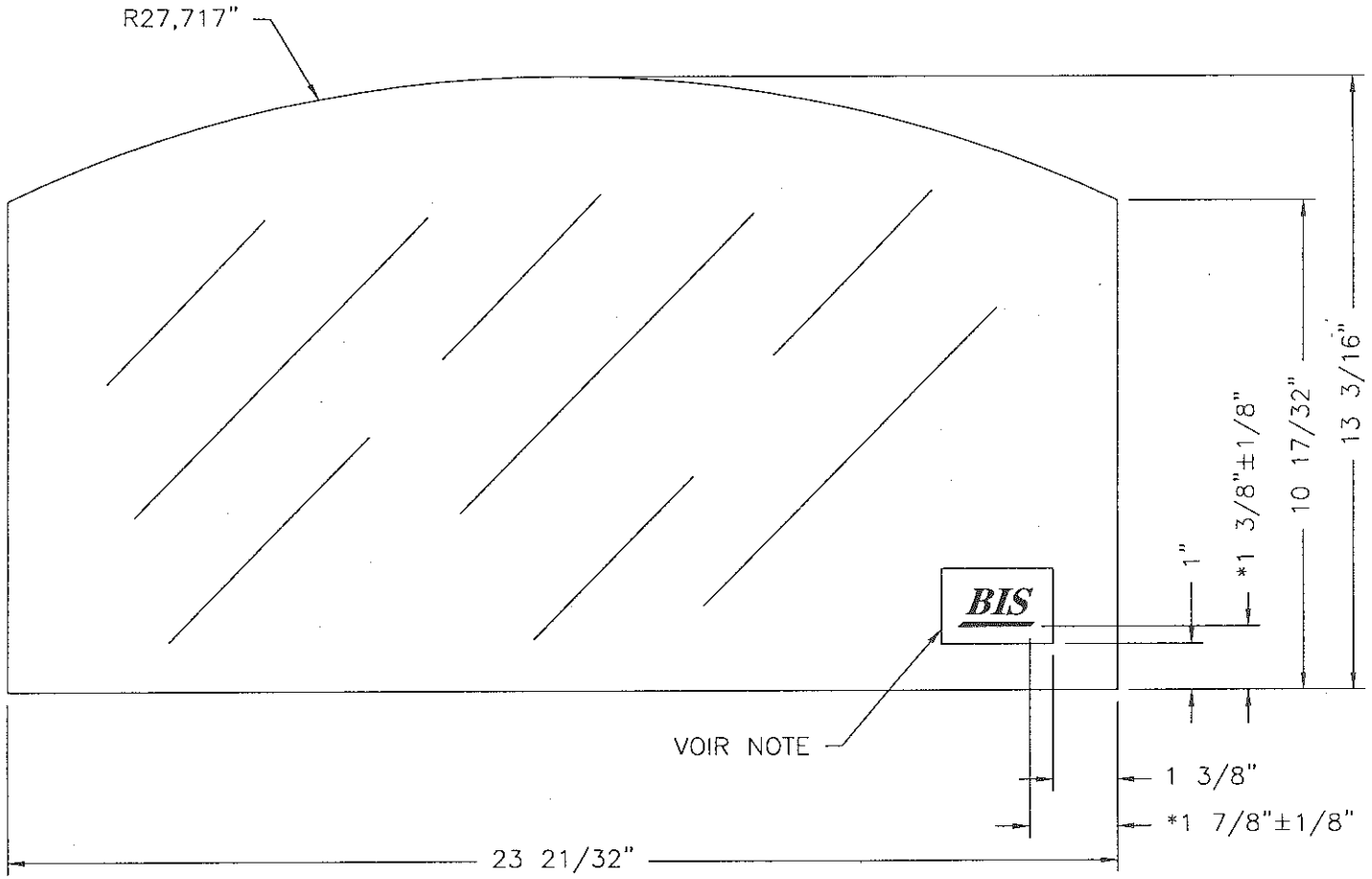
CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: JUNE 19, 01
ECH./SCALE: 1/8" = 1"
VERIFIE/CHECKED:
CODE: SR2221
PAGE: 3 of 3

SECURITY CHIMNEYS INTERNATIONAL LTD
CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± N/A
X.XX ± N/A | ANGLE ± 2°

NOM/NAME
SCOTT DOOR
SECTIONS DETAILS

REVISION:
DESSIN/DWG: 2221–2



NOTE:

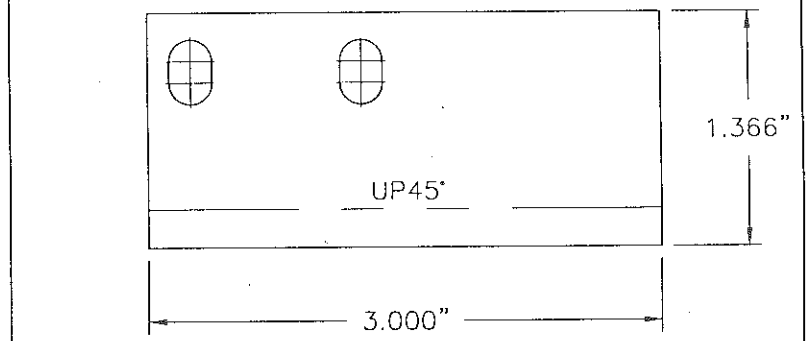
-THIS COMPONANT HAS A SANB-BLASTED LOGO ON ITS INFERIOR RIGTH SECTION. THE POLICE USED FOR THIS LOGO IS: NEWBASKERVILLE.

-THE FRAME SURROUNDING THE LOGO IS FOR REFERENCE USE ONLY. IT MUST NOT BE INCLUDED IN THE SAND-BLASTING PROCESS.

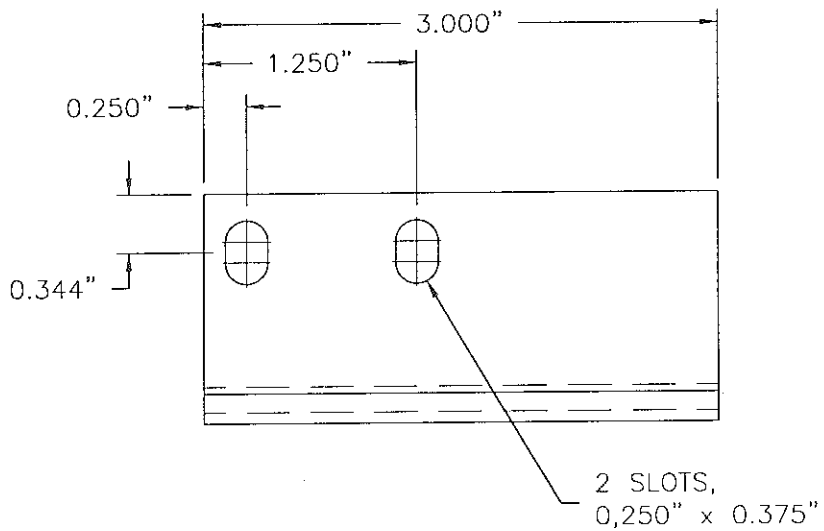
-THESE DIMENSIONS ARE FOR VERIFICATION ONLY.

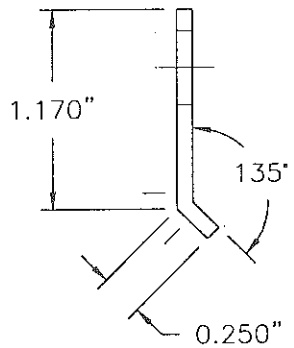
MATERIAL: CERAMIC GLASS 5mm

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: JUNE 22, 01	TOLERANCES GENERALES	
ECH./SCALE: 1/4" = 1"	FRACT. ± 1/32" / X.XXX ± 0.005" / X.XX ± 0.015" / ANGLE ± 2°	
VERIFIE/CHECKED:	NOM/NAME: CERAMIC GLASS	
CODE: SR2222		
PAGE: 1 of 1	REVISION	DESSIN/DWG: PROTO 2222



DEPLIE:





NOTE:

–THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.

–BENDING RADIUS EQUAL : 0.031"

MATERIAL: H.R.S 0.093"

#1	CHG. MATERIAL THICKNESS	OCT. 11, 01	C.G
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: JUNE 22, 01
ECH./SCALE: 7/8" = 1"
VERIFIE/CHECKED:
CODE: SR2223
PAGE: 1 of 1

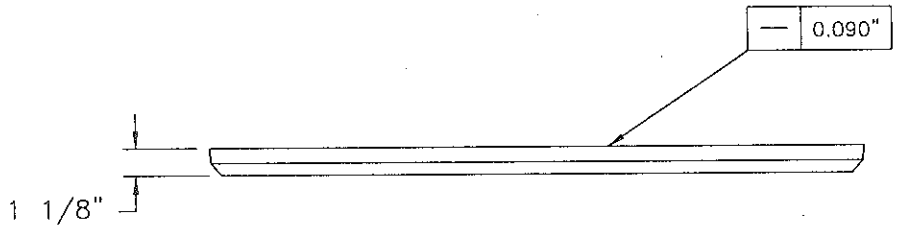
SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE

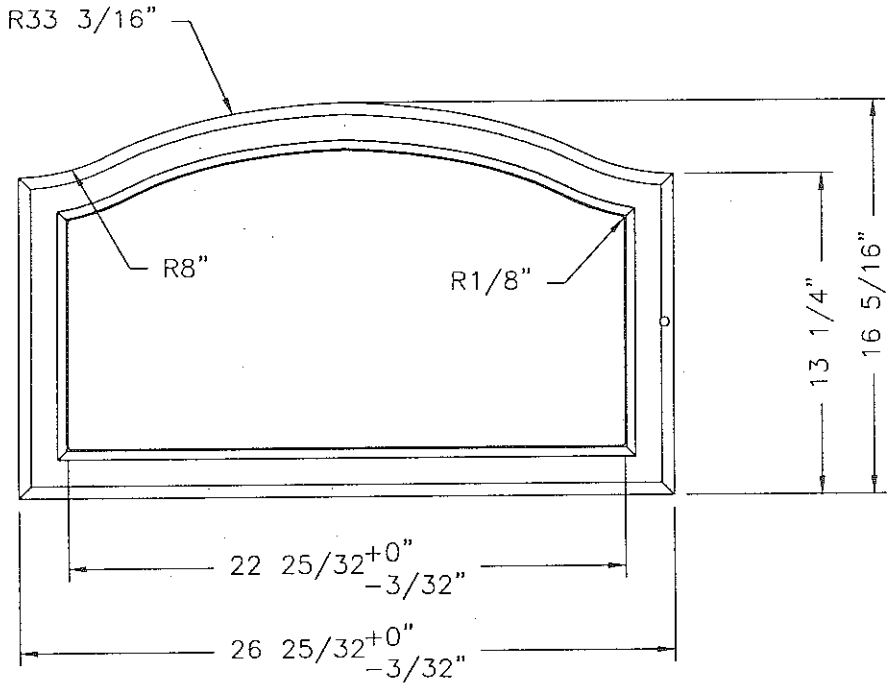
TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.015"
X.XX ± N/A | ANGLE ± 2°

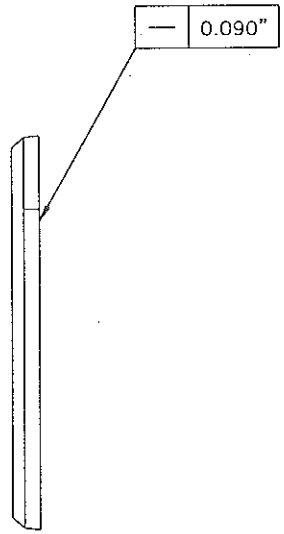
NOM/NAME: HINGES COVER

REVISION:

DESSIN/DWG: PROTO 2223



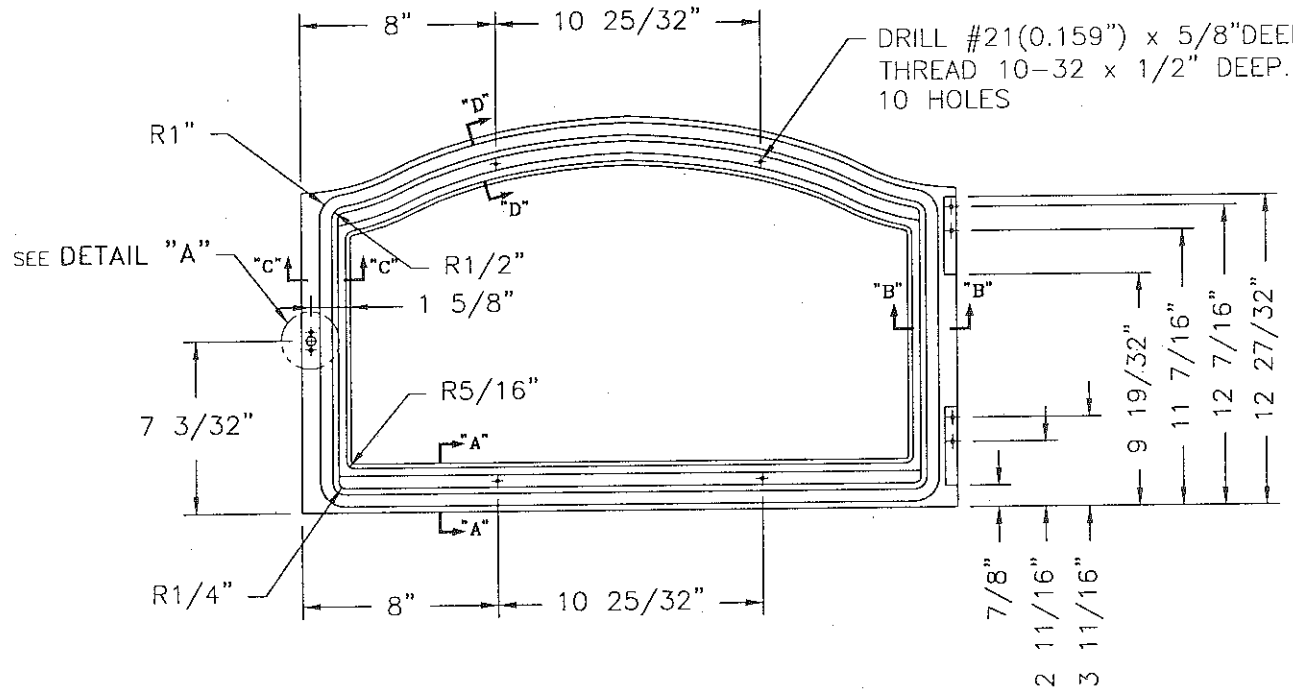


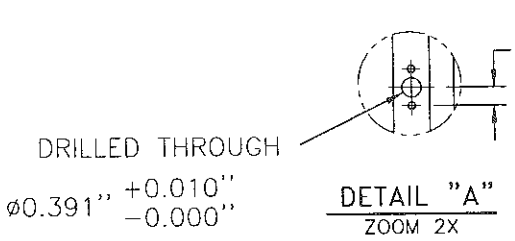


NOTE:
- FOR BACK SIDE VIEW SEE DRAWING 2226-1
- FOR SECTIONS DETAILS SEE DRAWING 2221-2

MATERIAL: GREY IRON, CLASSE 30, ASTM A48 TENSION MIN. 30.000 POUNDS

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD	TOLERANCES GENERALES: FRACT. ± 1/32" | X.XXX ± 0.005" | X.XX ± 0.015" | ANGLE ± 2°	
DATE: JUNE 19, 01		
ECH./SCALE: 1/8" = 1"		
VERIFIÉ/CHECKED:	NOM/NAME: VICTORIAN DOOR FRONT SIDE VIEW	
CODE: SR2226		
PAGE: 1 of 2	REVISION	DESSIN/DWG: 2226

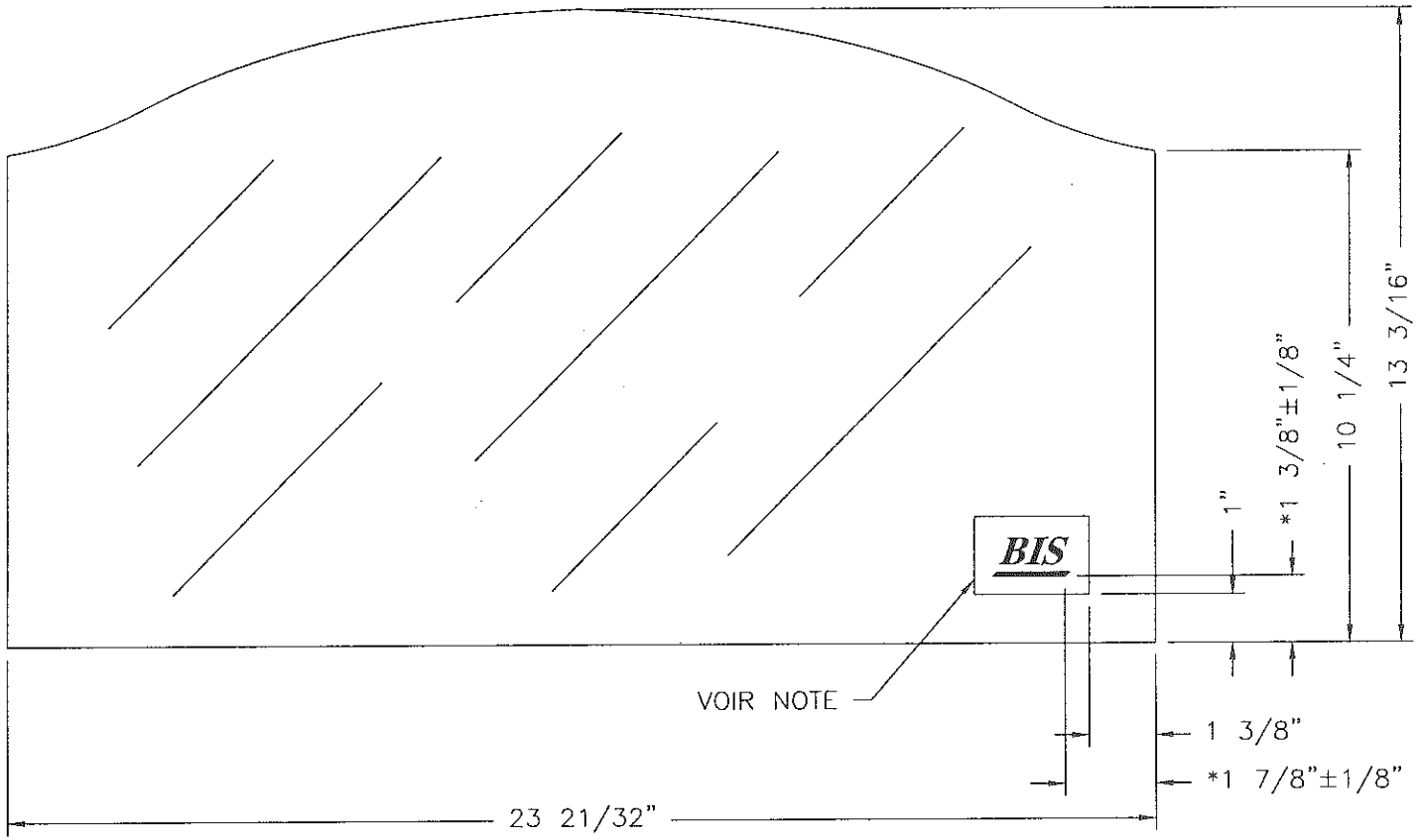




NOTE:
- SEE DRAWING 560-3 FOR SECTION DETAILS

MATERIAL: GREY IRON, CLASSE 30, ASTM A48 TENSION MIN. 30.000 POUNDS

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: JUNE 19, 01	TOLERANCES GENERALES: FRACT. ± 1/32" | X.XXX ± 0.005" | X.XX ± 0.015" | ANGLE ± 2°	
ECH./SCALE: 1/8" = 1"		
VERIFIE/CHECKED:	NOM/NAME: VICTORIAN DOOR	
CODE: SR2226		
PAGE: 2 of 2	REVISION:	DESSIN/DWG: 2226-1



NOTE:

-THIS COMPONANT HAS A SANB-BLASTED LOGO ON ITS INFERIOR RIGTH SECTION. THE POLICE USED FOR THIS LOGO IS: NEWBASKERVILLE.

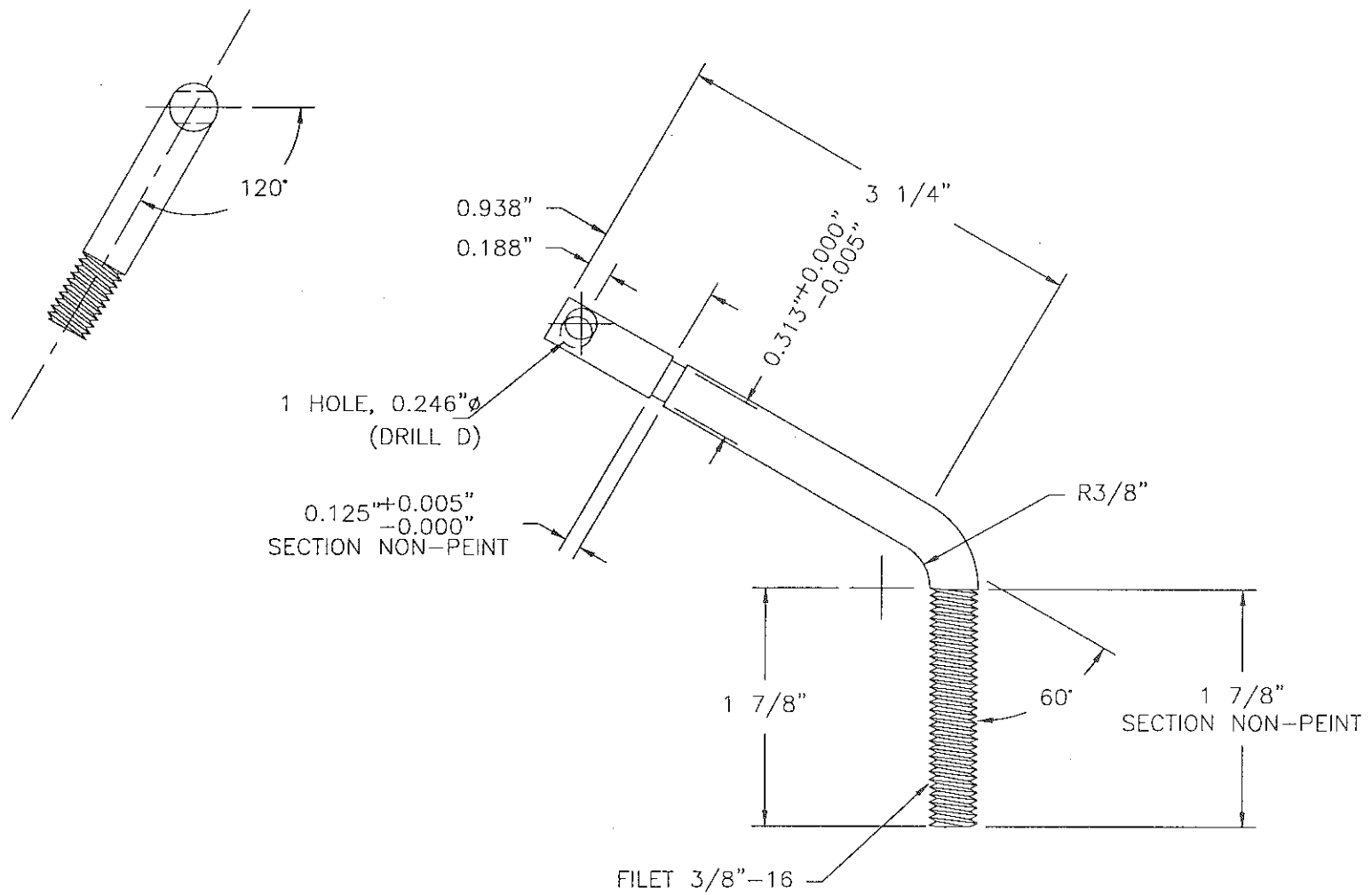
-THE FRAME SURROUNDING THE LOGO IS FOR REFERENCE USE ONLY. IT MUST NOT BE INCLUDED IN THE SAND-BLASTING PROCESS.

-THESE DIMENSIONS ARE FOR VERIFICATION ONLY.

MATERIAL: CERAMIC GLASS 5mm

REV.	DESCRIPTION	DE:

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINÉ/DRAWN: C. GRIMARD	
DATE: JULY 18, 01	TOLERANCES GENERALES: FRACT. ± 1/32" | X.XXX ± 0.005" | X.XX ± 0.015" | ANGLE ± 2°
ECH./SCALE: 1/4" = 1"	
VERIFIÉ/CHECKED:	NOM/NAME: CERAMIC GLASS
CODE: SR2230	
PAGE: 1 of 1	REVISION: / DESSIN/DWG: PROTO 2230



MATERIAL: ROD ø3/8" C.R.S ±0.006"

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD		
DATE: NOV 26, 01	UNITE/UNITS: INCHES	TOLERANCES: GENERAL: FRACT. ± 1/16", DEC. ± 0.015", ANGLE ± 2° / HOLES: DIAM. ± 0.005", LOC. ± 0.015", C. EN C. ± N/A
ECH./SCALE: 3/4" = 1"		
VERIFIÉ/CHECKED		
CODE: SR2268	NOM/NAME: DOOR HANDLE ROD	
PAGE: 1 of 1	REVISION	DESSIN/DWG: 2268

SECURITY FIREPLACE

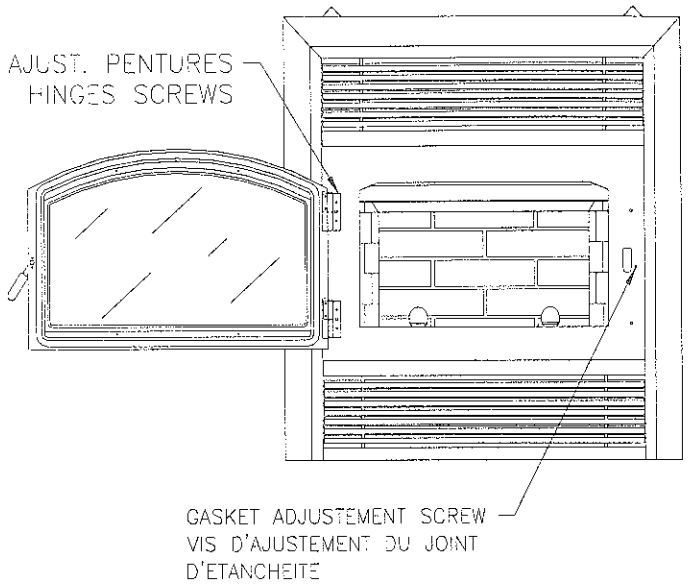
BIS VISTA - DOOR INSTALLATION

Door adjustment

The door of the BIS VISTA must be completely airtight. To make sure that the door is totally airtight, a paper should not be able to slide between the fireplace facade and the door's gasket. If the door is not totally airtight, there is a screw on the right side of the fireplace facade that can be tightened to adjust the door.

If the alignment of the door needs to be adjusted, simply loosen the upper screw and the lower screw on each hinge which fix the door to the facade (note that the middle screw does not need to be loosened). The door can then be moved side-ways in order to allow for a proper fit.

If there is difficulty closing the door because there is too much compression of the gasket between the door and the fireplace facade (especially on the hinge side), then adjusting the space between the door and the fireplace facade will solve that problem. To adjust, loosen all the screws on each hinge that are fixed on the door. Push the door toward the fireplace facade to increase the space or pull it toward you to reduce that space.



Glass care - Replacement

The glass used for the BIS VISTA is a high temperature ceramic glass (1400° F). If the glass breaks, it must be replaced with a ceramic glass. Tempered glass or ordinary glass will not withstand the high temperatures of the BIS VISTA. Replacement glass should be purchased from a Security Chimneys International dealer. Do not operate the unit with cracked or broken glass.

Glass care - Cleaning

The BIS VISTA is designed to keep the glass clean under normal operating conditions. If the BIS VISTA is operated continuously with the combustion air damper closed, the glass will tend to get dirty unless the fuel, firebox and glass are maintained at hot temperatures. To clean the glass, there are a number of specially designed cleaners. Your authorized Security dealer can recommend a suitable cleaner which is available in your area. Regular household glass cleaners will not clean creosote. Do not use abrasives such as steel pads, steel wool or oven cleaner as they will scratch the glass.

SECURITY CHIMNEYS INTERNATIONAL LTD
2125 MONTEREY St. • LAVAL, QUEBEC., CANADA • H7L 3T6 • ☎ (450) 973-9999

Printed in Canada 01/ 2001 Rév. 00 Ref.: F126

Section E-2

FIREPLACE AND DOOR FABRICATION DRAWINGS WITH COMPONENTS

BIS VISTA

CHEMINÉES SÉCURITÉ LTÉE

BISVISTA

revision #

26-nov-01

BL	BISVISTA	DESCRIPTION	DRAWING	CODE	ASS.
0	1	BIS VISTA ASSEMBLY	2235	SR2235	
1	1	FIREPLACE BOTTOM	2187	SR2187	
1,01	2	FIREBOX SUPPORT	2188	SR2188	
1,02	1	PRIMARY AIR CONTROL BOX	2191	SR2191	
1,021	2	PRIMARY AIR CONTROL BOX SIDE	2192	SR2192	
1,03	1	FIREBOX BOTTOM	2181	SR2181	
1,04	1	FIREBOX REINFORCEMENT SUPPORT	2213	SR2213	
1,05	1	AIR BOOST OBSTRUCTION PLATE	2236	SR2236	
1,06	1	OBSTRUCTION PLATE SUPPORT	2237	SR2237	
1,07	2	SPACER	1697	SR1697	
1,08	1	AIR BOOST BOX CONTOUR	2238	SR2238	
1,09	1	AIR BOOST BOX FRONT	2239	SR2239	
1,1	1	AIR BOOST BOX BACK	2240	SR2240	
1,11	2	MACHINED PIPE	BIS204	B2ST2	
1,12	1	AIR BOOST BOX GASKET	2253	SR2253	
1,13	1	HEAT DEFLECTOR	2255	SR2255	
2	1	FIREBOX CONTOUR	2183	SR2183	
,01	1	FIREBOX TOP	2182	SR2182	
2,02	1	PRIMARY AIR DEFLECTOR	2185	SR2185	
2,03	1	FLUE GAZ BAFFLE	2186	SR2186	
2,04	1	FIREBOX REINFORCEMENT SUPPORT	2213	SR2213	
2,05	4	SECONDARY AIR TUBE 3/4" DIA	1994	SR1994B	
2,06	1	TUBES LOCK PLATE	2214	SR2214	
2,07	2	SECONDARY AIR BOX	2193	SR2193	
2,08	1	FACADE	2184	SR2184	
3	1	AIR BOOST REGISTER	2241	SR2241	
3,01	1	PRIMARY AIR CONTROL REGISTER	2195	SR2195	
3,02	2	SPACER 0,093	2242	SR2242	
3,03	3	SPACER	2243	SR2243	
3,04	1	PRIMARY AIR CONTROL PLATE	2244	SR2244	
3,05	1	AIR ENTRY PIPE	1958	SR1958	
3,06	1	ALUM. FLEX PIPE (3" DIA X 18")	1950	SR1950	
3,07	1	AIR ENTRY PIPE GASKET	1862	SR1862	
3,08	1	AIR ENTRY PIPE PLATE	1863	SR1863	
3,09	1	AIR TUBE	2215	SR2215	
3,1	2	FASTENING CLIP	B2CLIP	B2CLIP	
4	1	FACADE SIDE FRAME	2189	SR2189G	
4,01	1	FACADE SIDE FRAME	2189	SR2189D	
,02	1	FACADE TOP FRAME	2190	SR2190	
4,03	1	FACADE CAPING	2194	SR2194	
4,031	1	BOTTOM FACADE CAPING	2263	SR2263	
4,04	1	FIREPLACE BACK PANEL	2197	SR2197	

BIS VISTA

CHEMINÉES SÉCURITÉ LTÉE

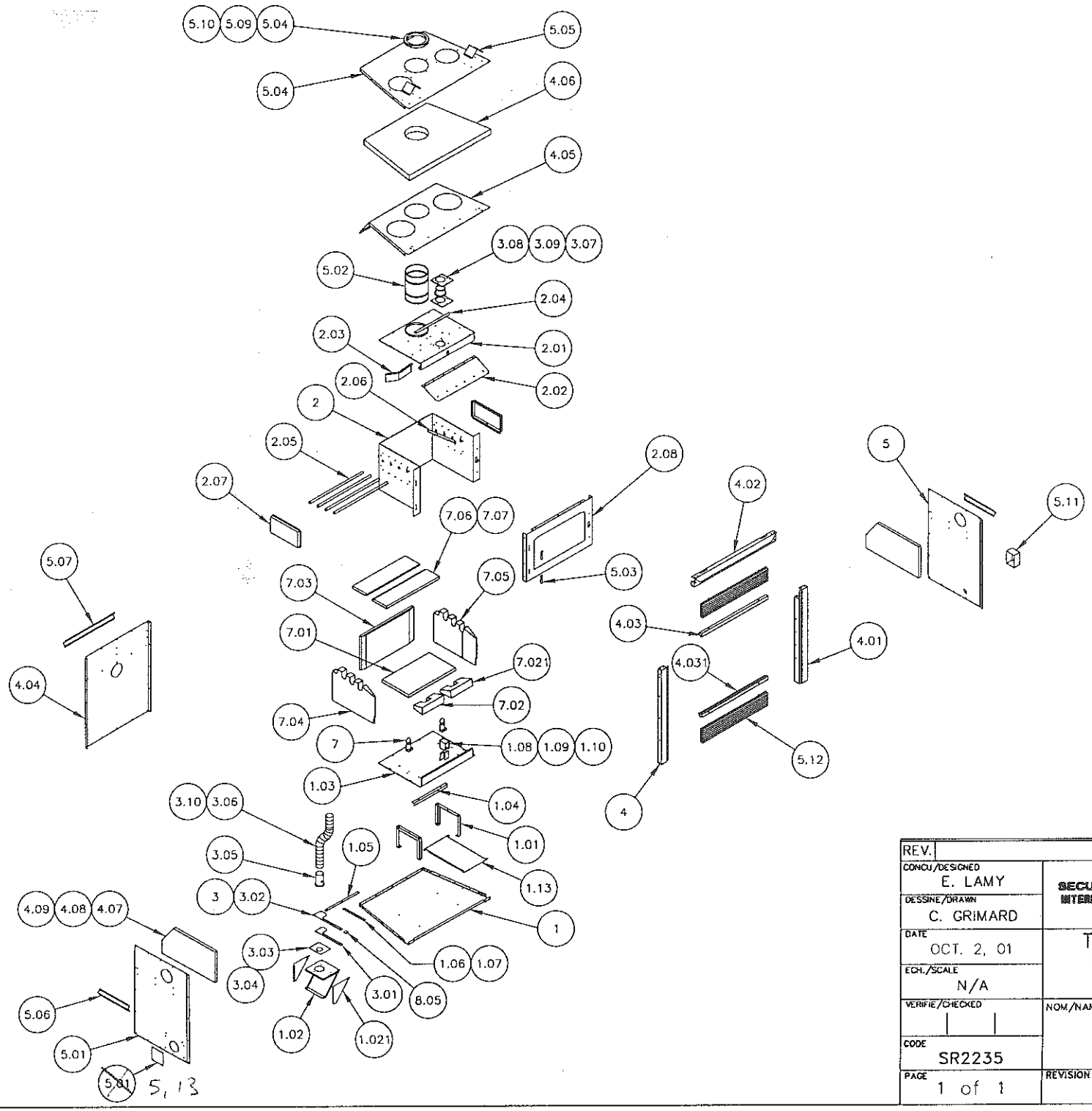
BISVISTA

revision #

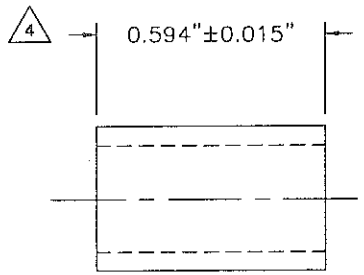
26-nov-01

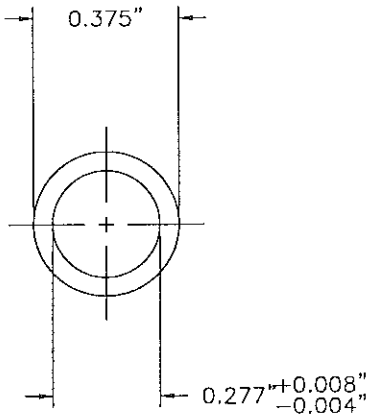
B I S V I S T A

BL		DESCRIPTION	DRAWING	CODE	ASS.
4,05	1	INSULATION SUPPORT	2196	SR2196	
4,06	1	TOP INSULATION	2217	ISO2217	
4,07	2	SIDE INSULATION	2219	ISO2219	
4,08	2	SUPPORT NAIL	AI01	AI01	
4,09	2	SUPPORT NAIL PLATE	AI02	AI02	
5	1	FIREPLACE RIGHT SIDE PANEL	2200	SR2200	
5,01	1	FIREPLACE LEFT SIDE PANEL	2199	SR2199	
5,02	1	FLUE	2216	SR2216	
5,03	2	LEFT FIXED HINGE	1800-1	SR1800G	
5,04	1	FIREPLACE TOP	2198	SR2198	
5,05	2	TOP STAND-OFF	1838	SR1838	
5,06	2	SIDE STAND-OFF	1837	SR1837	
5,07	1	BACK STAND-OFF	1849	SR1849	
5,09	4	COUPLING EXTERIOR CLIP	128	SB118	
5,1	1	CERAMIC FIBER GASKET	1850	ISO1850	
5,11	1	ELECTRIC BOX 20-20	HE12	HE12	
5,12	2	LOUVER ASSEMBLY	2218	SR2218	
,13	1	AIR OBSTRUCTION PLATE	2256	SR2256	
6	1,25	FORREST PAINT METALLIC BLACK	PEPR11	PEPR11	
7	2	ANDIRON	2245	SR2245	
7,01	1	BOTTOM REFRACTORY	2201	SR2201	
7,02	1	FRONT REFRACORY	2202	SR2202G	
7,021	1	FRONT REFRACORY	2202	SR2202D	
7,03	1	BACK REFRACTORY	2203	SR2203	
7,04	1	SIDE REFRACTORY	2204	SR2204G	
7,05	1	SIDE REFRACTORY	2204	SR2204D	
7,06	2	TOP BAFFLE	2205	SR2205	
8	1	SECURITY FIREPLACE LOGO	ETCS107	ETCS107	
8,01	1	NAME PLATE	NP247	NP247	
8,02	1	EPA NAME PLATE	NP248	NP248	
8,03	1	SCREW 1/4"-20 UNC 3/8"	VIS2	VIS2	
8,04	1	PLASTIC CAP	B2PP1	B2PP1	
8,05	1	BAG (INSTALLATION MANUEL)	SACBISULTRA	SACBISULTRA	
8,06	1	8" X 12" ZIP LOCK BAG	SAC8X12	SAC8X12	
8,07	1	INSTALLATION INSTRUCTIONS	PIBISVISTA	PIBISVISTA	
8,08	1	CSIL WARRANTY (WOOD)	CGFB01	CGFB01	
8,09	1	DOOR INSTALLATION LABEL	NP217	NP217	
8,1	1	BOTTOM BOX	2257	BT2257	
,11	1	BOX CONTOUR	2254	BT2254	
,12	4	BOX CORNER	2261	BT2261	
8,13	2	TRIANGLE CORNERS	2262	BT2262	
8,14	1	LABEL PRINT AT CSL-MODEL/INFO	ETCODE16	ETCODE16	



REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD	TOLERANCES GENERALES	
DATE: OCT. 2, 01	FRACT. ± N/A; X.XXX ± N/A	
ECH./SCALE: N/A	X.XX ± N/A; ANGLE ± N/A	
VERIFIE/CHECKED:	NOM/NAME: BIS VISTA ASSEMBLY	
CODE: SR2235		
PAGE: 1 of 1	REVISION	DESSIN/DWG: PROTO 2235

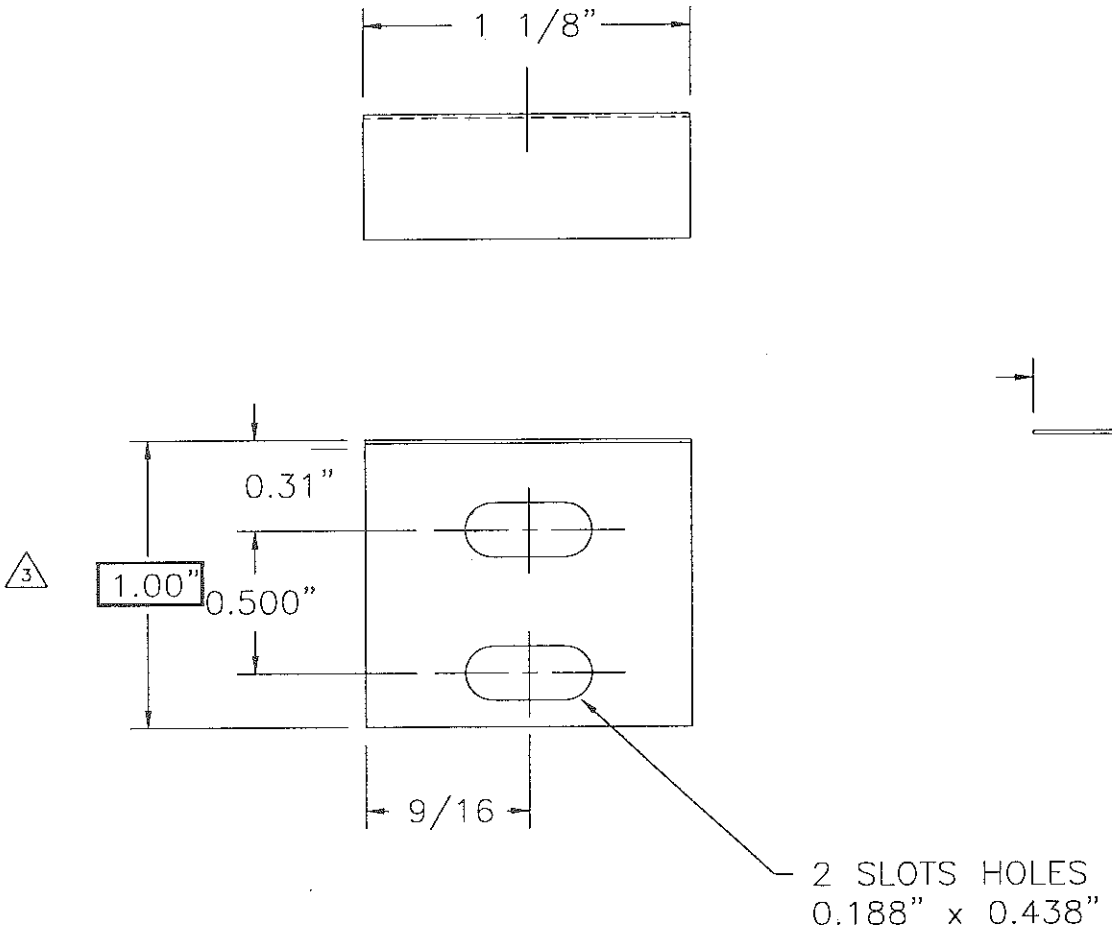




MATERIAL: T ROLLED OU COLD ROLLED

#4	ADDE TOLERANCE	NOV. 22, 99	C.G
REV.	DESCRIPTION	DATE	DE:

CONCU/DESIGNED: L. SANSCARTIER	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE		
DESSINÉ/DRAWN: P. GORRY			
DATE: NOV. 30, 1994	NOM/NAME: MACHINED PIPE		
ECH./SCALE: 2" = 1"			
TOLERANCES: FRACT. ± 1/32" .XX ± 0.015" .XXX ± 0.005" ANGLE ± 0.5'	CODE: B2ST2	REVISION: #4	
VERIFIÉ/CHECKED	PAGE: 1 of 1	DESSIN/D.: BIS204	

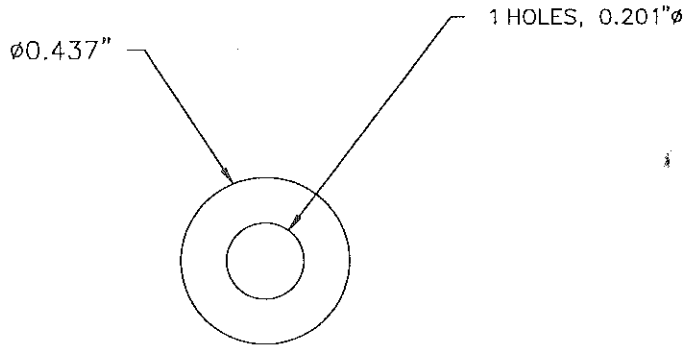


NOTE:

- PIECE IS SYMMETRICAL WRT TO CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: ACIER INOXYDABLE 430, 0.014" MIN.
ACIER INOXYDABLE 444, 0.014" MIN.
ACIER INOXYDABLE 304, 0.014" MIN
1.125"X 1.440"

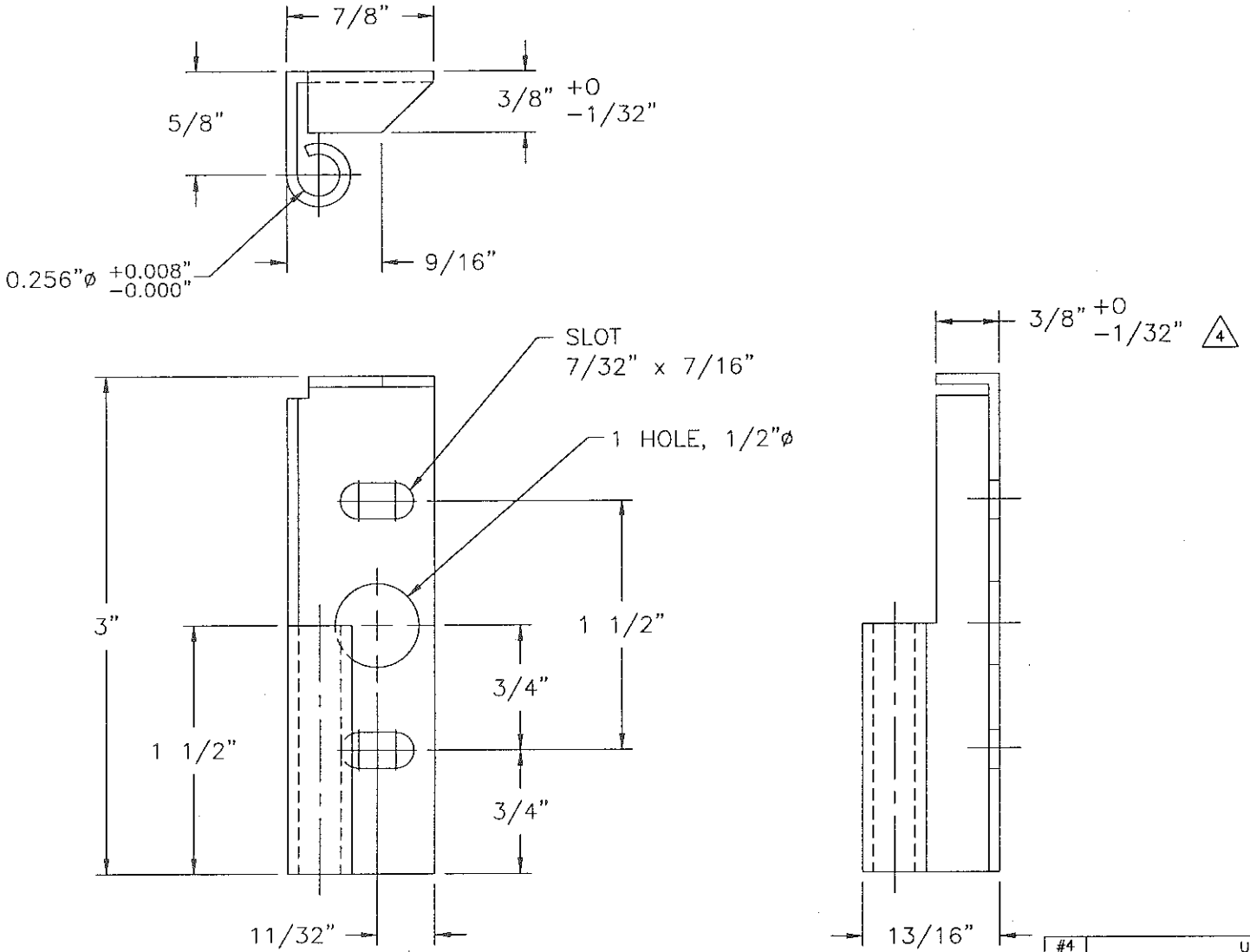
#3	DIM. IMP. ENCRADRER	AUGUST 1, 95	E.L.
REV.	DESCRIPTION	DATE	DE:
CONCU/DESIGNED	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE		
DESSINE/DRAWN: S.GENDRON			
DATE: FEV. 25-91	NOM/NAME: COUPLING EXTERIOUR CLIP		
ECH./SCALE: 1"= 3/4"			
TOLERANCES: FRACT. ± 1/32" .XX ± 0.015" .XXX ± 0.005" ANGLE ± 1°	CODE: SB118	REVISION: #3 AOUT 1-95	
VERIFIE/CHECKED	PAGE: 1 of 1	DESSIN/F.: 128	



-THE DIMENSIONS IN THE BOX
INDICATE MEASURMENTS TO BE INSPECTED.

MATERIAL: S. 11 GA (0.119"±0.008")

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: L. PAGE	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: N.BASDRAVALAS		
DATE: SEPT. 8, 97	UNITÉ/UNITS: INCHES	TOLERANCES: GENERAL: FRACT. ± 1/32" DEC. ± 0.010" ANGLE ± 2° HOLES: DIAM. ± 0.005" LOC. ± 0.005" C. EN C. ± 0.005"
ECH./SCALE: 2" = 1"		
VERIFIÉ/CHECKED		
CODE	NOM/NAME: SPACER	
PAGE: 1 of 1	REVISION	DESSIN/ 1697



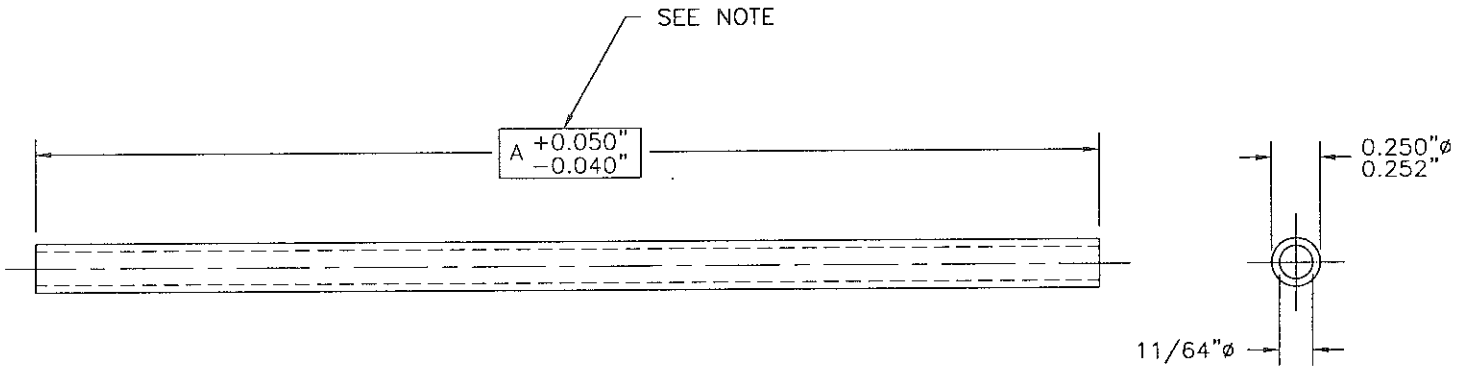
MATERIAL: C.R.S 14GA.

#4	UP DATE	APRIL 10, 00	C.G
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: L. PAGE	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD		
DATE: MAY 25, 98	UNITE/UNITS: INCHES	TOLERANCES: GENERAL: FRACT. ± 1/32" DEC. ± 0.005" ANGLE ± 2° HOLES: DIAM. ± 1/32" LOC. ± 1/32" C. EN C. ± 1/32"
ECH./SCALE: 1" = 1"		
VERIFIÉ/CHECKED		
CODE: SR1800G	NOM/NAME: LEFT FIXED HINGE	
PAGE: 2 of 2	REVISION: #4	DESSIN/ 1800-1

CODE	DIMENSIONS			MATERIALS
	A	B	C	
SR1830	5.375"	---	---	LM09TUBE10
SR1830A	7.089"	---	---	LM09TUBE10
SR1830B	6.313"	---	---	LM09TUBE10

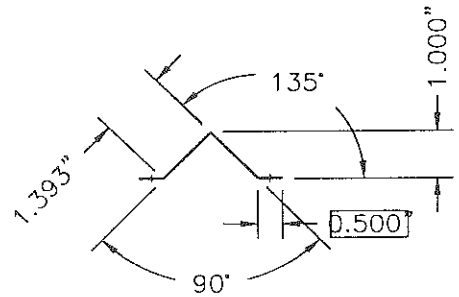
△4

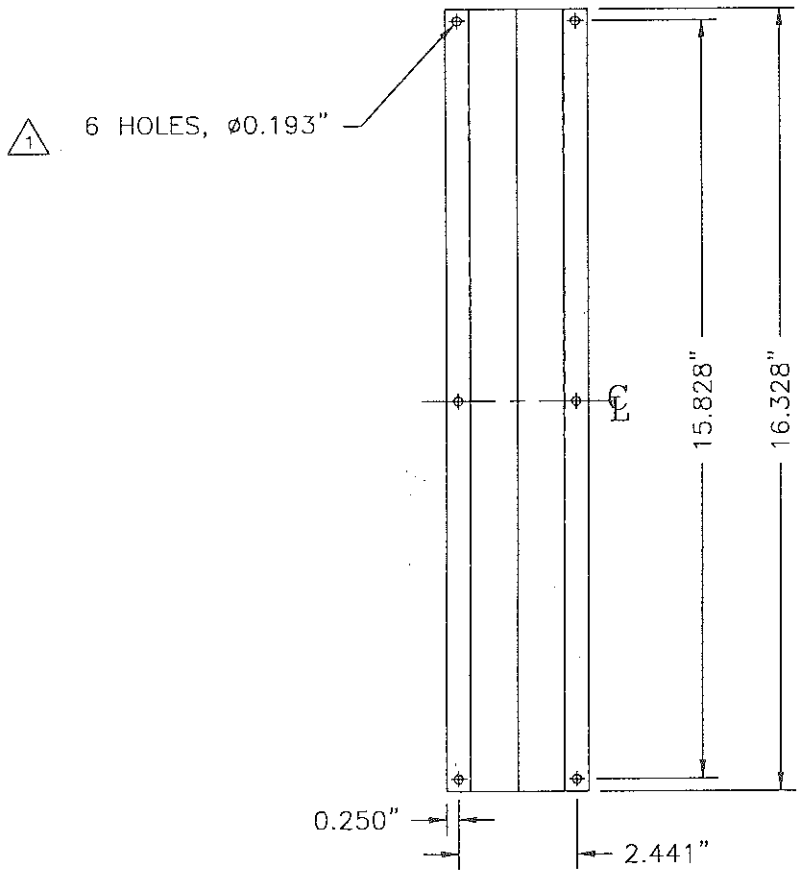


MATERIAL: ALUMINIUM 3003 H18 NATURAL

REV.	DESCRIPTION		DE:
#4	ADD MODEL	JUNE 21, 01	C.G
#3	CHG. DIMENSIONS END TOLERENCE	MARCH 22, 01	C.G

CONCU/DESIGNED: G. LEBLANC	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINE/DRAWN: C. GRIMARD	TOLERANCES GENERALES: FRACT. ± 1/32" | X.XXX ± 0.005" | X.XX ± 0.015" | ANGLE ± 2°
DATE: JUNE 10, 98	
ECH./SCALE: 1" = 1"	
VERIFIE/CHECKED: | |	NOM/NAME: LOUVER TUBE
CODE: ----	
PAGE: 1 of 1	REVISION: #4 | DESSI: 1830





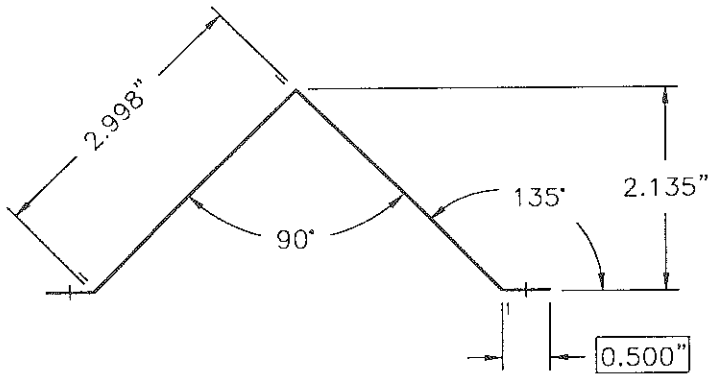
NOTE:

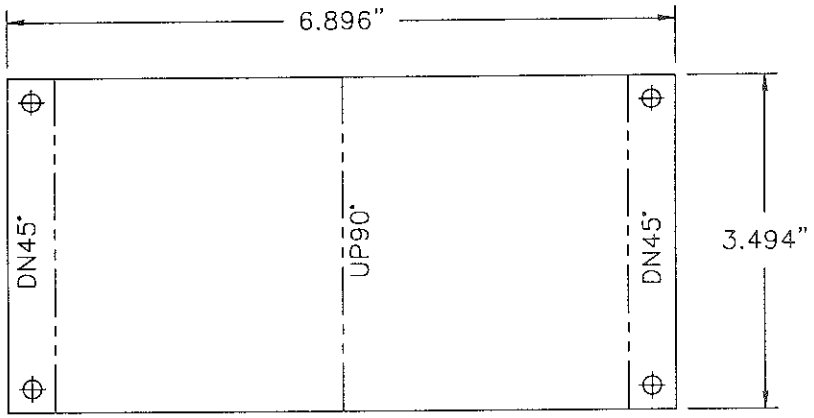
- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: —— VANIZED 0.021"

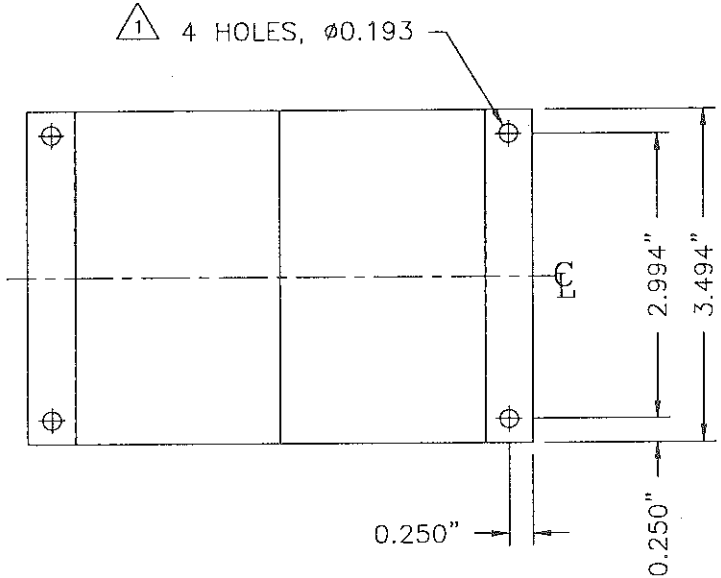
REV.	DESCRIPTION	DE:
#1	ADDED HOLESø	13 NOV. 01 C.G

CONCU/DESIGNED: G. LEBLANC	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE		
DESSINE/DRAWN: C. GRIMARD			
DATE: JUNE 29, 98	UNITE/UNITS: INCHES	TOLERANCES: GENERAL:	HOLES:
ECH./SCALE: 1/4" = 1"		FRACT. ± N/A	DIAM. ± 0.005"
VERIFIE/CHECKED:		DEC. ± 0.015"	LOC. ± 0.015"
		ANGLE ± 2°	C. EN C. ± 0.005"
CODE: SR1837	NOM/NAME: SIDE STAND-OFF		
PAGE: 1 of 1	REVISION: #1	DESSIN/ 1837	





DEPLIE:

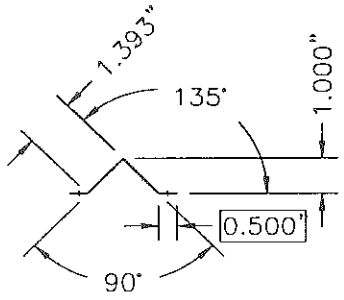


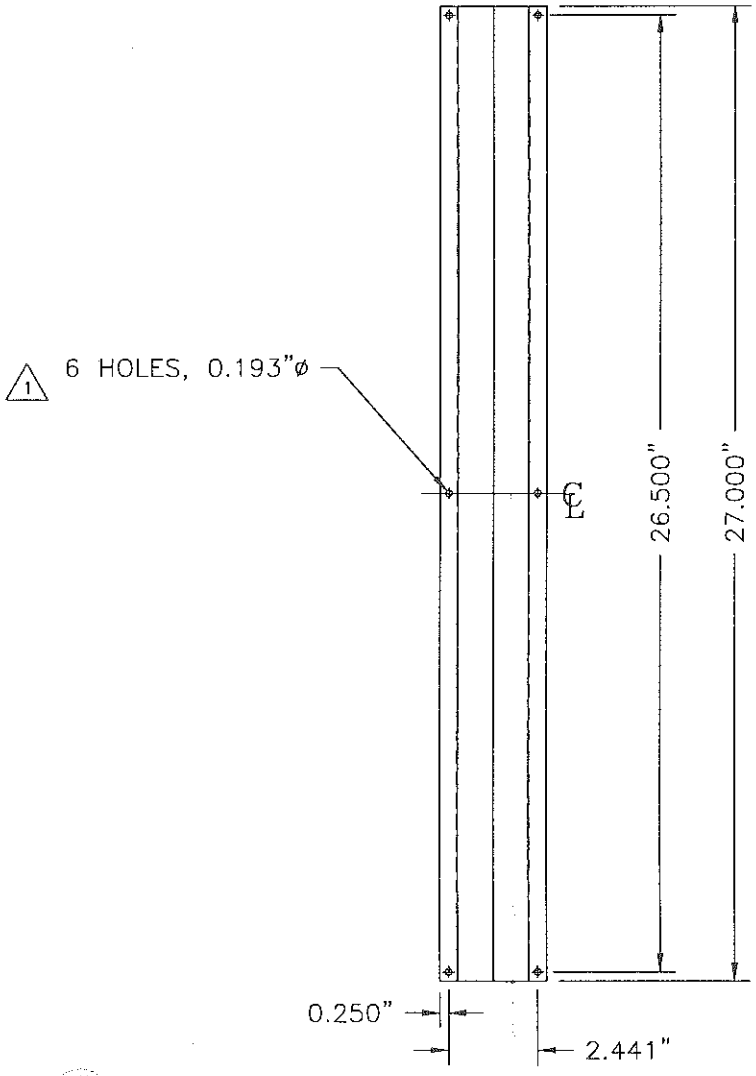
NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL : GALVANIZED 0.021"

#1	CHG. HOLES ø0.188" ---->ø0.193"	JULY 13, 01	C.G
REV.	DESCRIPTION		DE:
CONCU/DESIGNED: G. LEBLANC	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE		
DESSINE/DRAWN: C. GRIMARD			
DATE: JUNE 23, 98	TOLERANCES GENERALES		
ECH./SCALE: 1/2" = 1"	FRACT. ± 1/32"	X.XXX ± 0.015"	
	X.XX ± N/A	ANGLE ± 2°	
VERIFIE/CHECKED	NOM/NAME: TOP STAND-OFF		
CODE: SR1838			
PAGE: 1 of 1	REVISION: #1	DESSIN: 1838	



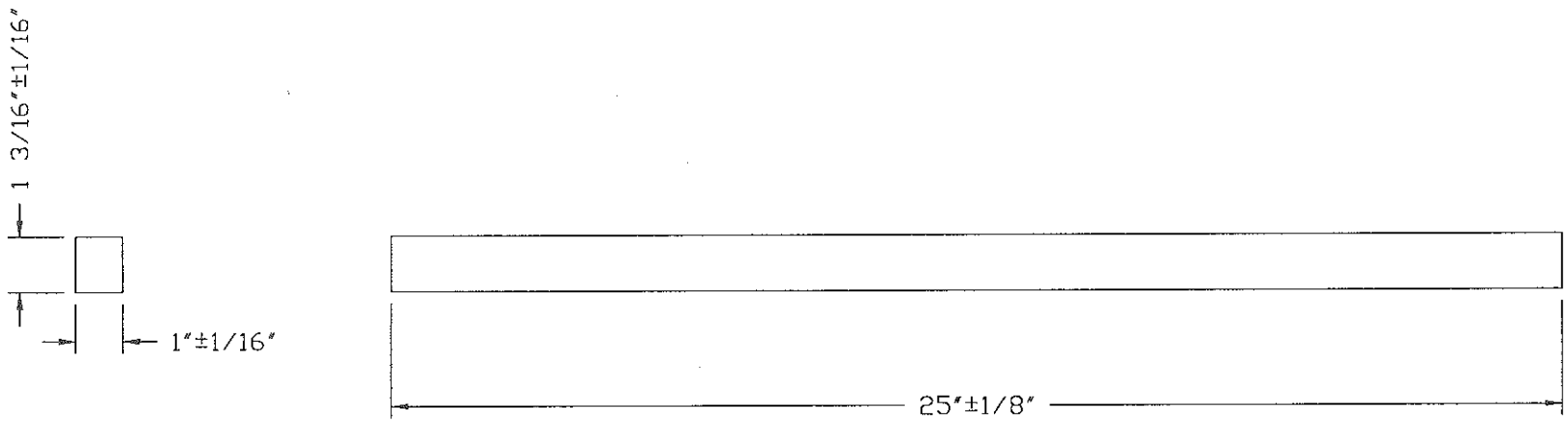


NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: GALVANIZED 0.021"

#1	CHG. HOLES ø0.188"-->ø0.193"	SEPT. 18, 01	C.G
REV.	DESCRIPTION		DE:
CONCU/DESIGNED: G. LEBLANC	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE		
DESSINÉ/DRAWN: C. GRIMARD			
DATE: JUNE 28, 98	TOLERANCES GENERALES		
ECH./SCALE: 3/16" = 1"	FRACT. ± 1/32"	X.XXX ± 0.015"	
VERIFIÉ/CHECKED	X.XX ± N/A	ANGLE ± 2°	
	NOM/NAME: BACK STAND-OFF		
CODE: SR1849			
PAGE: 1 of 1	REVISION #1	DESSIN: 1849	



#1	CHG. TOLERENCE & ADDED CODE	DEC. 10, 99	C.G
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: G. LEBLANC
DESSINE/DRAWN: C. GRIMARD
DATE: JUNE 30, 98
ECH./SCALE: 1/4" = 1"
VERIFIE/CHECKED:

SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

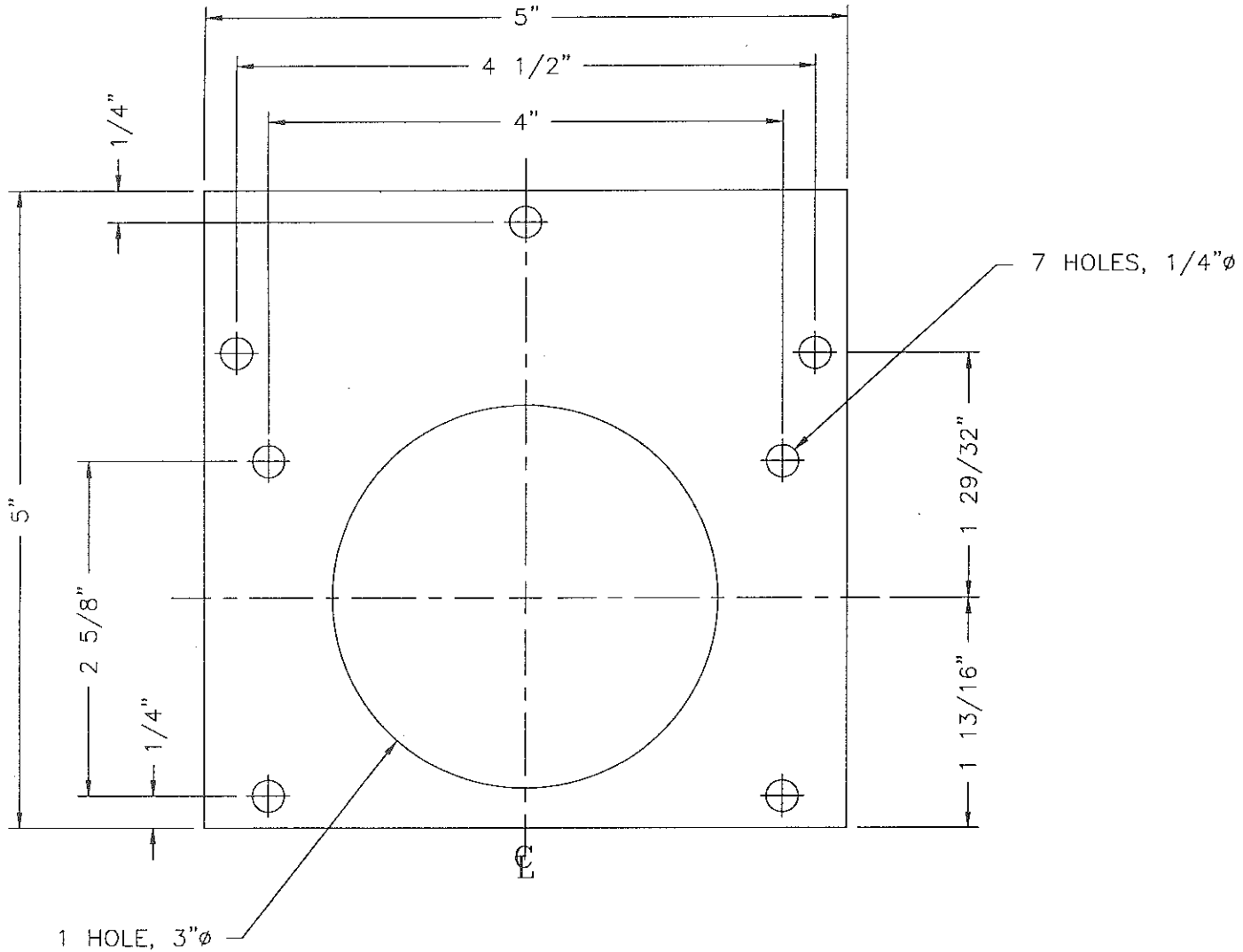
UNITE/UNITS: INCHES

TOLERANCES:

GENERAL:	HOLES:
FRACT. ± 1/8"	DIAM. ± N/A
DEC. ± N/A	LOC. ± N/A
ANGLE ± 2'	C. EN C. ± N/A

CODE: ISO1850
NOM/NAME: CERAMIC FIBER GASKET
PAGE: 1 of 1
REVISION: #1
DESSIN: 1850

MATERIAL: CERAMIC FIBER

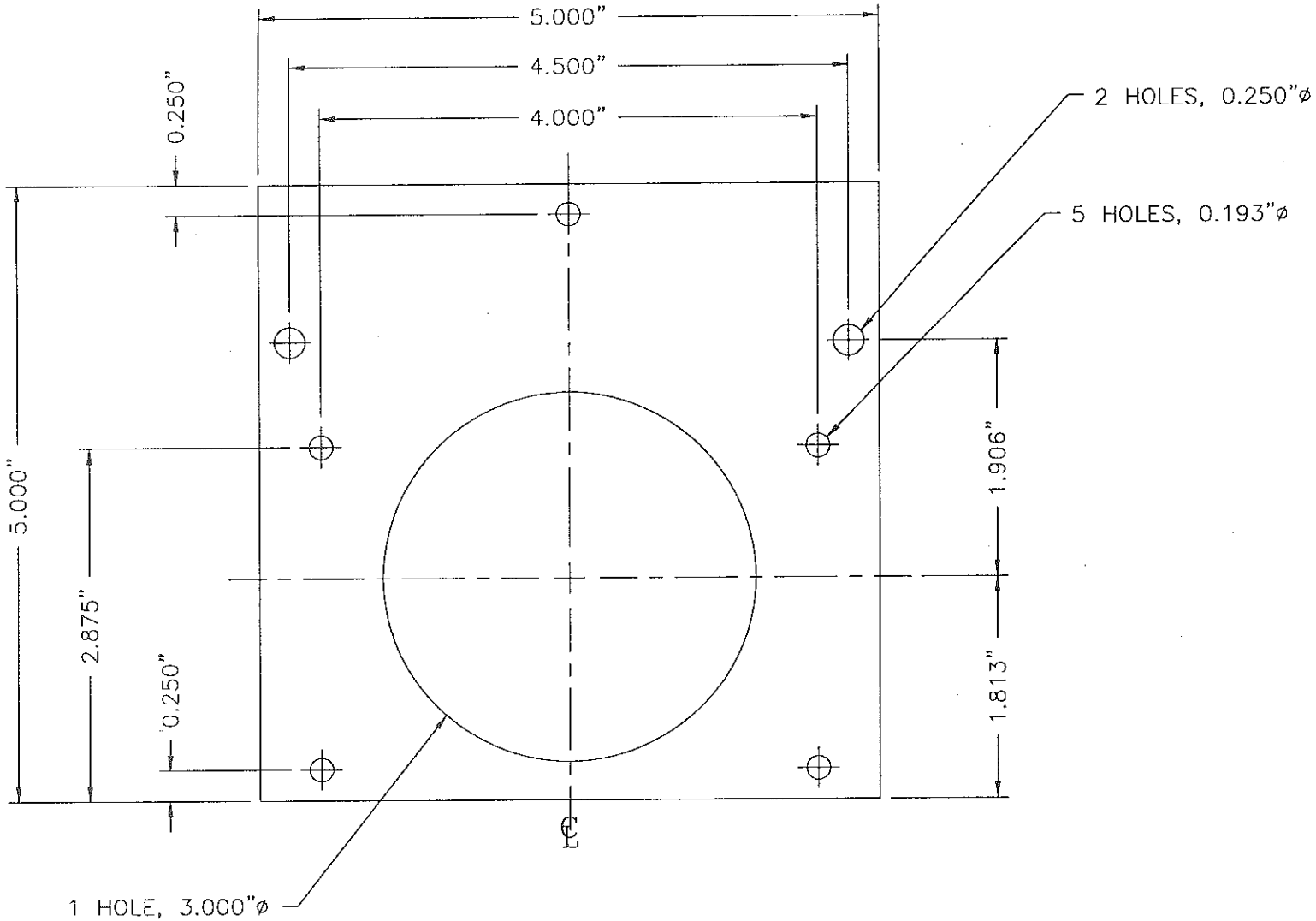


NOTE:

– PIECE SYMÉTRIQUE PAR RAPPORT À LA LIGNE DE CENTRE À MOINS D'INDICATION CONTRAIRE.

MATERIAL: GASKET CERAMIC 1/8"

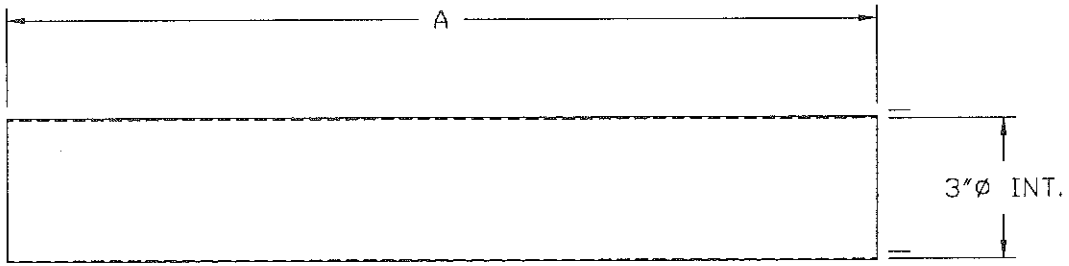
REV.	DESCRIPTION	DE:
CONCU/DESIGNED: G. LEBLANC	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: AUGUST 14 98	UNITE/UNITS: INCHES	TOLERANCES: GENERAL: FRACT. ± 1/32", DEC. ± N/A, ANGLE ± 2' — HOLES: DIAM. ± 1/32", LOC. ± 1/32", C. EN C. ± 1/32"
ECH./SCALE: 3/4" = 1"		
VERIFIE/CHECKED		
CODE	NOM/NAME: AIR ENTRY PIPE GASKET	
PAGE: 1 of 1	REVISION	DESSIN/ 1862



NOTE:
–PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.

MATERIAL: TIN COAT 0.050"

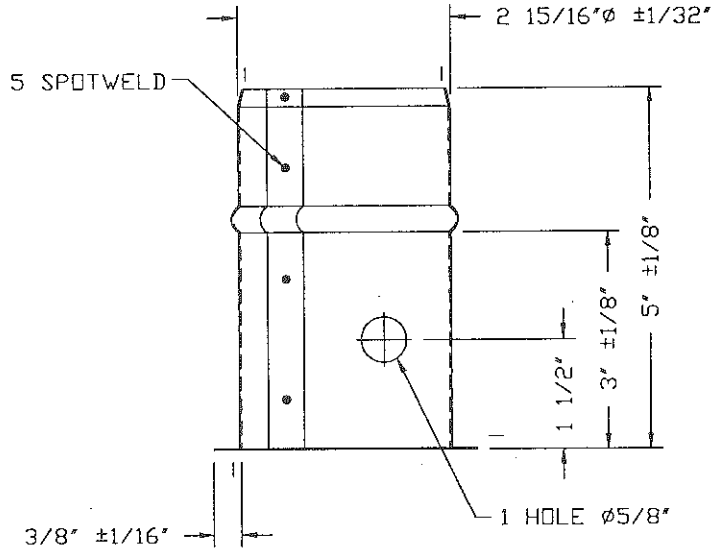
REV.	DESCRIPTION	DE:
CONCU/DESIGNED: G. LEBLANC	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD		
DATE: AUGUST 14 98	UNITÉ/UNITS: INCHES	TOLERANCES: GENERAL: FRACT. ± N/A; DEC. ± 0.015"; ANGLE ± 2° — HOLES: DIAM. ± 0.005"; LOC. ± 0.015"; C. EN C. ± 0.005
ECH./SCALE: 3/4" = 1"		
VERIFIÉ/CHECKED		
CODE	NOM/NAME: AIR ENTRY PIPE PLATE	
PAGE: 1 of 1	REVISION	DESSIN: 1863

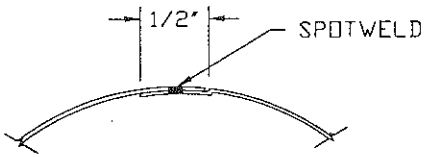


	"A"
STETCH	42"
COMPRESSE	18"

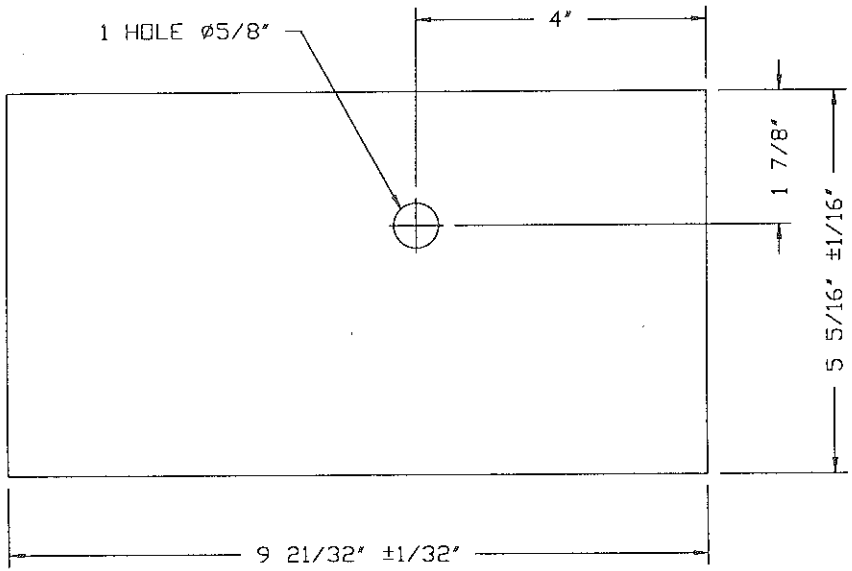
MATERIAL: ALUMINIUM SIMPLE THICKNESS

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. DUFOUR	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD	TOLERANCES GENERALES	
DATE: MAY 10, 99	FRACT. ± 1/32" / X.XX ± 0.015" / X.XXX ± 0.005	ANGLE ±2°
ECH./SCALE: 1/4" = 1"		
VERIFIÉ/CHECKED:		
CODE: SR1950	NOM/NAME: ALUM. FLEX PIPE (3" DIA x 18")	
PAGE: 1 of 1	REVISION	DESSIN, 1950





SIMPLE OVERLAP

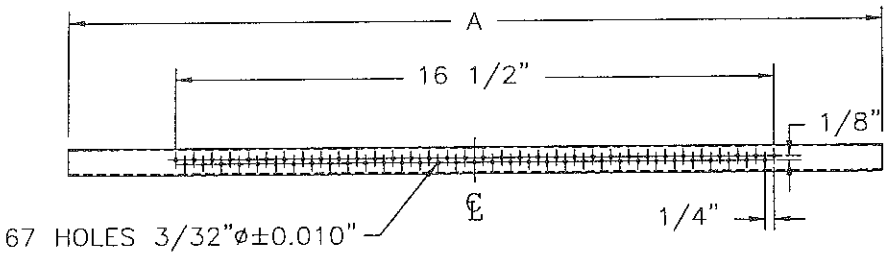


UNFOLD

MATERIAL: TIN COAT 0.018"

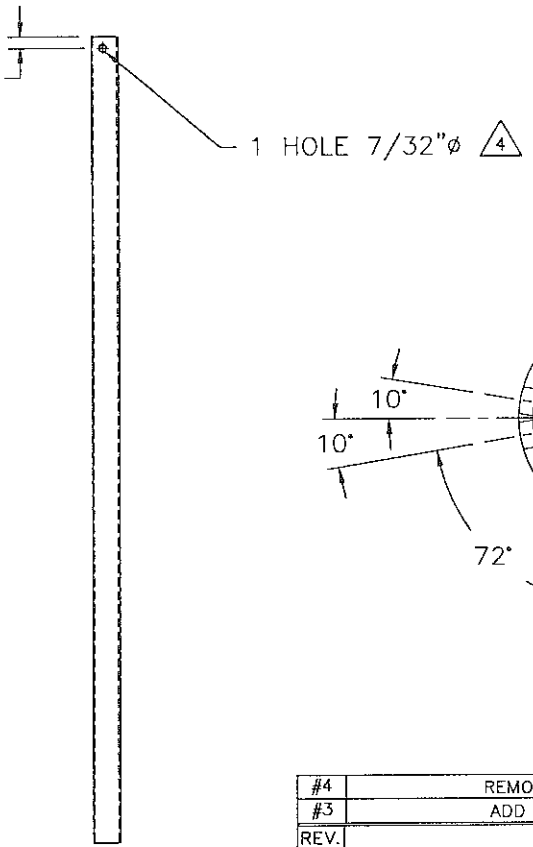
REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. DUFOUR	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD	TOLERANCES GENERALES	
DATE: MAY 6, 99	FRACT. ± 1/32" / X.XX ± 0.015" / X.XXX ± 0.005"	ANGLE ±2°
ECH./SCALE: 3/8" = 1"		
VERIFIÉ/CHECKED:		
CODE: SR1958	NOM/NAME: AIR ENTRY PIPE	
PAGE: 1 of 2	REVISION	DESSIN/ 1958

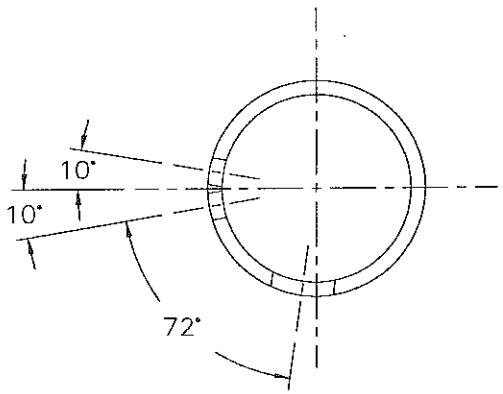
MODEL	DIMENSIONS
	A ±1/16"
SR1994A	22 7/16"
SR1994B	23 7/8"
SR1994C	24 11/16"





SEE DETAIL "A"





DETAIL "A"

MATERIEL:
- TUBE 3/4"ø EXT. STRUCTURAL
- INOX. STEEL 304 0.049" (18 GAGE)

REV.	DESCRIPTION	DATE	DE:
#4	REMOVE 1 HOLES	MAY 11, 01	C.G
#3	ADD TOLERENCE	APRIL 21, 01	MC

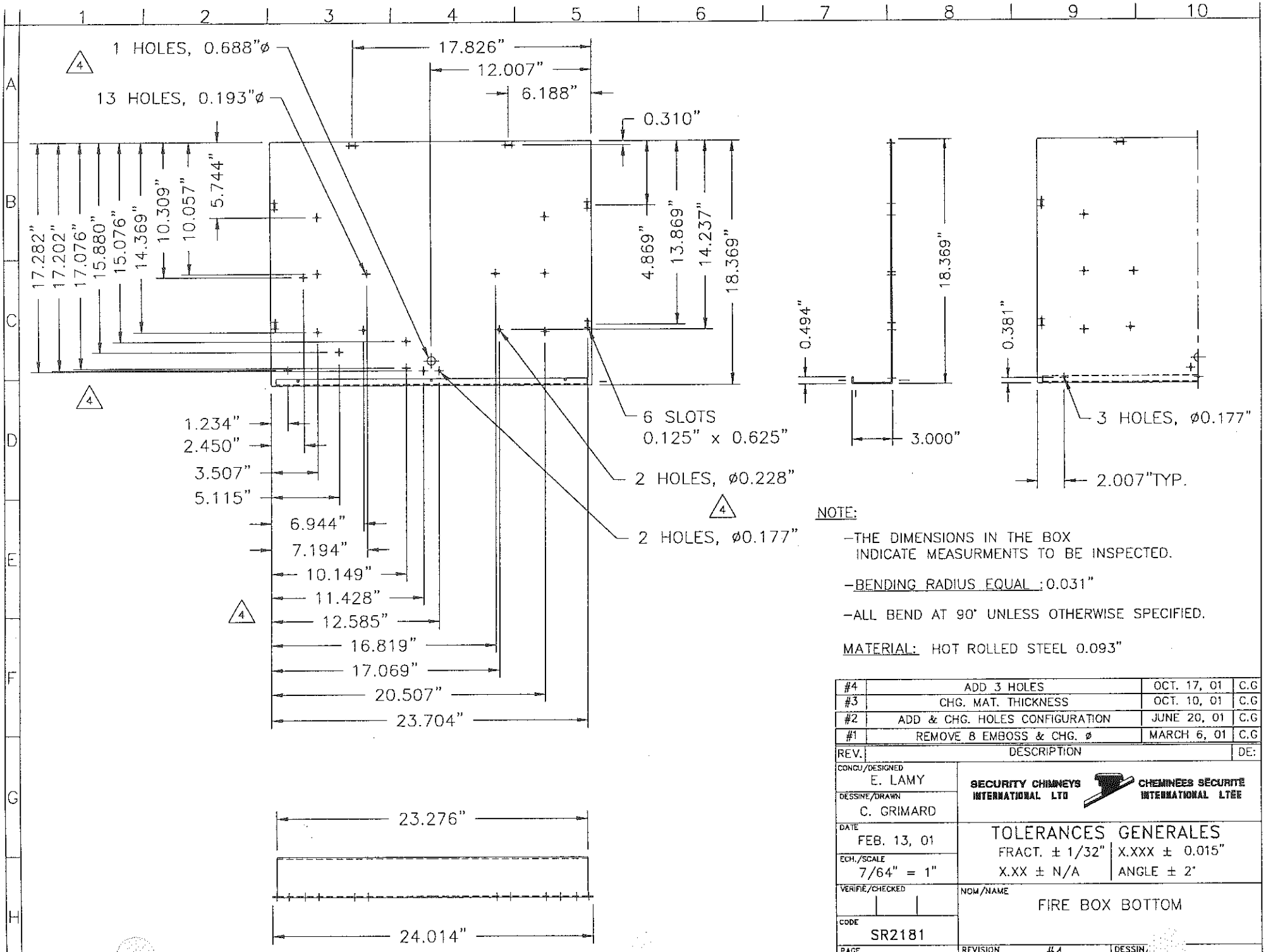
CONCU/DESIGNED: E. DUFOUR
DESSINE/DRAWN: M. CHAURETTE
DATE:
ECH./SCALE: 3/16" = 1"
VERIFIE/CHECKED:

SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES

FRACT. ± 1/32" | ANGLE ±2°
X.XX ± 0.015"
X.XXX ± 0.005"

CODE: SR1994
NOM/NAME: SEC. AIR TUBE 3/4" DIA
PAGE: 1 1
REVISION: #4
DESSIN/: 1994



NOTE:

–THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.

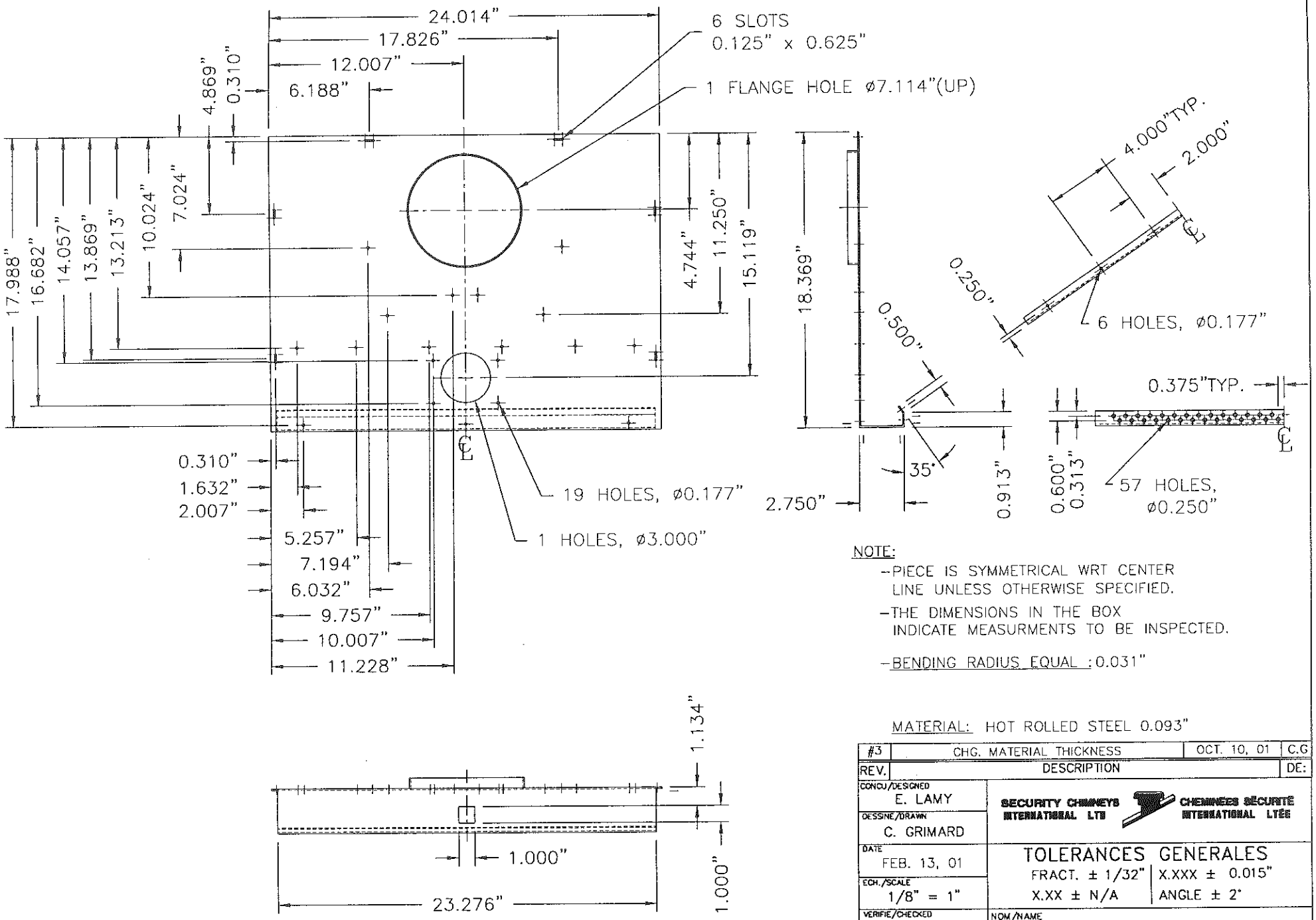
–BENDING RADIUS EQUAL : 0.031"

–ALL BEND AT 90° UNLESS OTHERWISE SPECIFIED.

MATERIAL: HOT ROLLED STEEL 0.093"

REV.	DESCRIPTION		DE:
#4	ADD 3 HOLES	OCT. 17, 01	C.G
#3	CHG. MAT. THICKNESS	OCT. 10, 01	C.G
#2	ADD & CHG. HOLES CONFIGURATION	JUNE 20, 01	C.G
#1	REMOVE 8 EMBOSS & CHG. ø	MARCH 6, 01	C.G

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINÉ/DRAWN: C. GRIMARD	
DATE: FEB. 13, 01	TOLERANCES GENERALES: FRACT. ± 1/32" X.XXX ± 0.015" X.XX ± N/A ANGLE ± 2°
ECH./SCALE: 7/64" = 1"	
VERIFIÉ/CHECKED:	NOM/NAME: FIRE BOX BOTTOM
CODE: SR2181	
PAGE: 1 of 2	REVISION #4 — DESSIN/ PROTO 2181



NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: HOT ROLLED STEEL 0.093"

REV.	DESCRIPTION	DATE	DE:
#3	CHG. MATERIAL THICKNESS	OCT. 10, 01	C.G

CONCU/DESIGNED	E. LAMY
DESSINE/DRAWN	C. GRIMARD
DATE	FEB. 13, 01
ECH./SCALE	1/8" = 1"
VERIFIE/CHECKED	
CODE	SR2182
PAGE	1 of 2

SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES

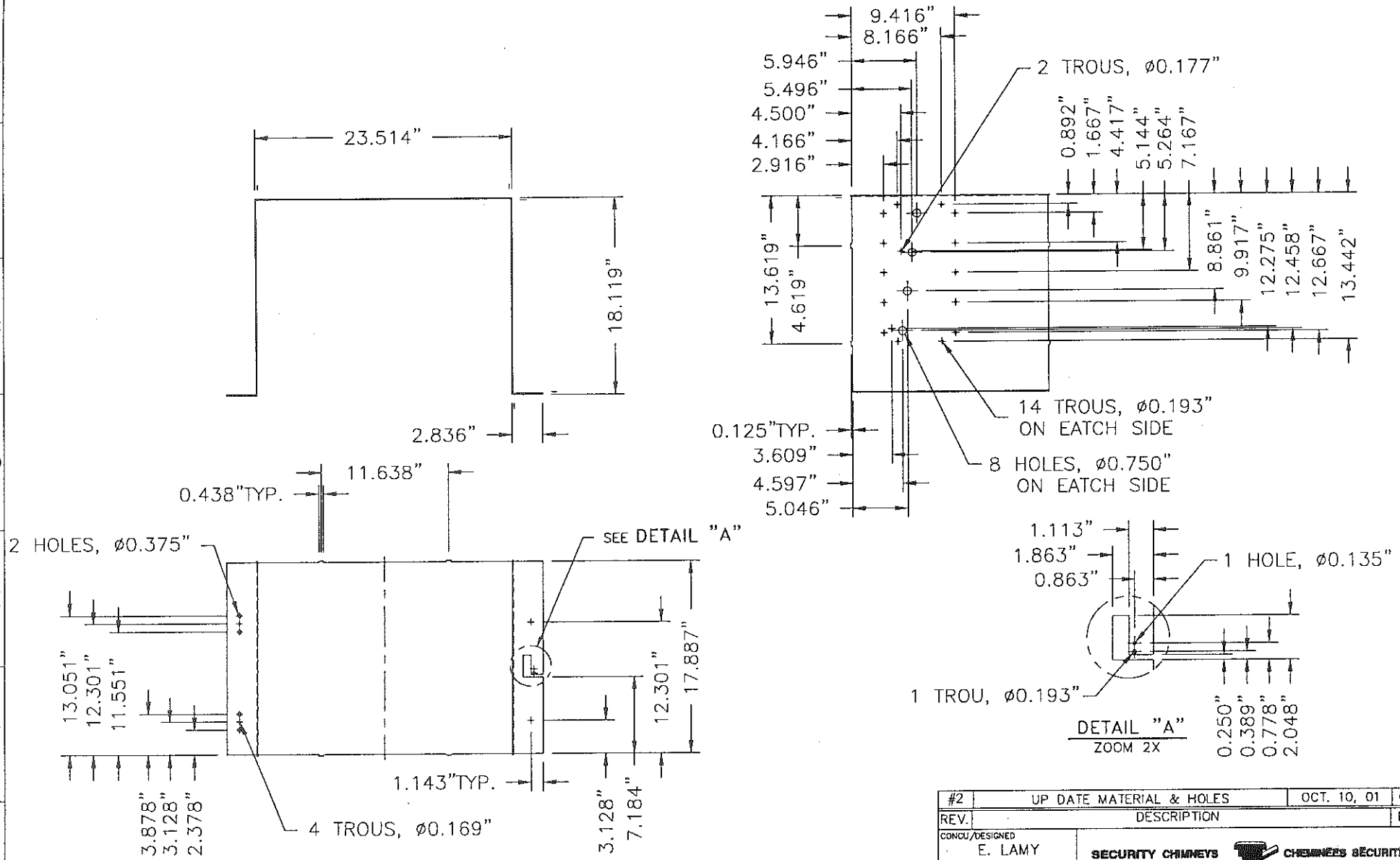
FRACT. ± 1/32" | X.XXX ± 0.015"

X.XX ± N/A | ANGLE ± 2°

NOM/NAME: FIREBOX TOP

REVISION #3

DESSI PRO 2182



NOTE:

-THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.

-ALL BEND AT 90° UNLESS OTHERWISE SPECIFIED.

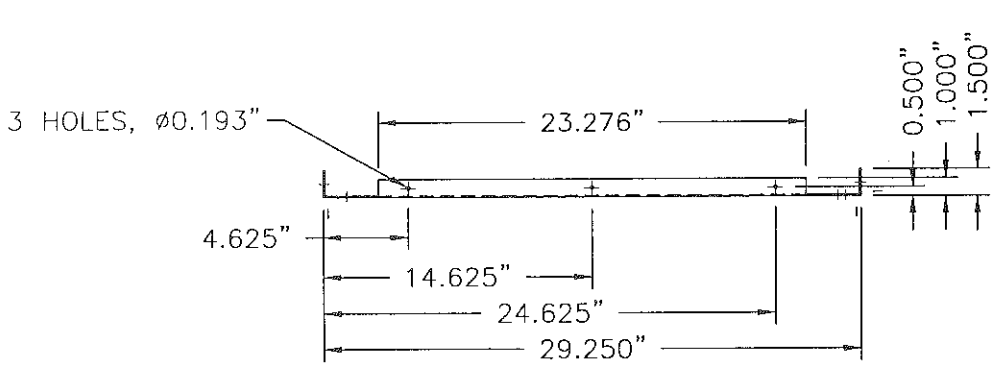
-BENDING RADIUS EQUAL : 0.031"

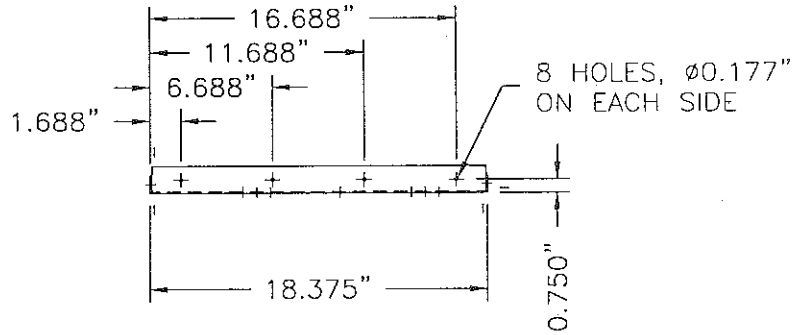
MATERIAL: T ROLLED STEEL 0.093"

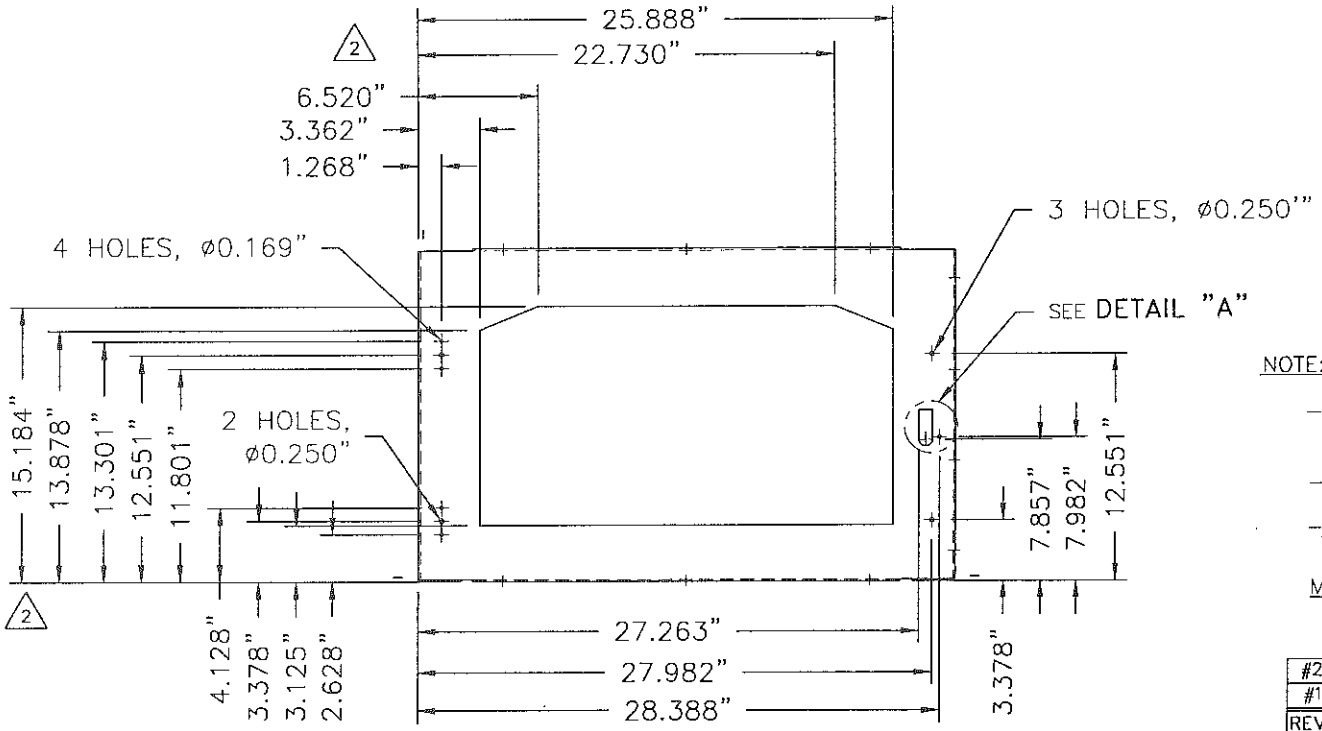
2

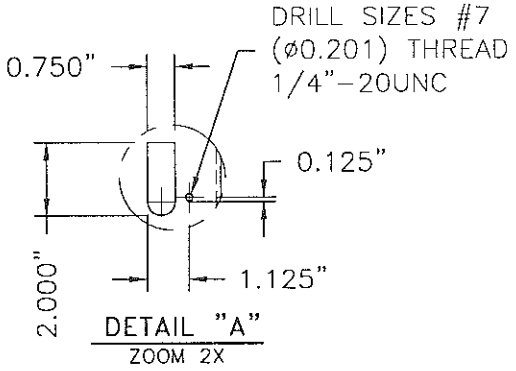
#2	UP DATE MATERIAL & HOLES	OCT. 10, 01	C.G
REV.	DESCRIPTION		DE:

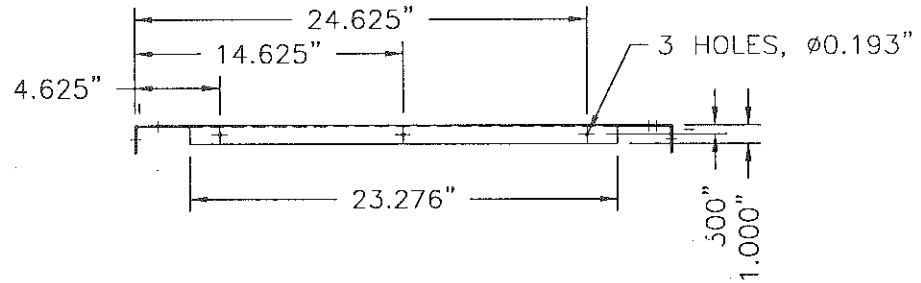
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: FEB. 21, 01	TOLERANCES GENERALES	
ECH./SCALE: 5/64" = 1"	FRACT. ± 1/32"	X.XXX ± 0.015"
VERIFIÉ/CHECKED:	X.XX ± N/A	ANGLE ± 2°
CODE: SR2183	NOM/NAME: FIREBOX CONTOUR	
PAGE: 1 of 2	REVISION #2	DESSIN, PRO. 2183











NOTE:

-THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.

-ALL BEND AT 90° UNLESS OTHERWISE SPICIFIED.

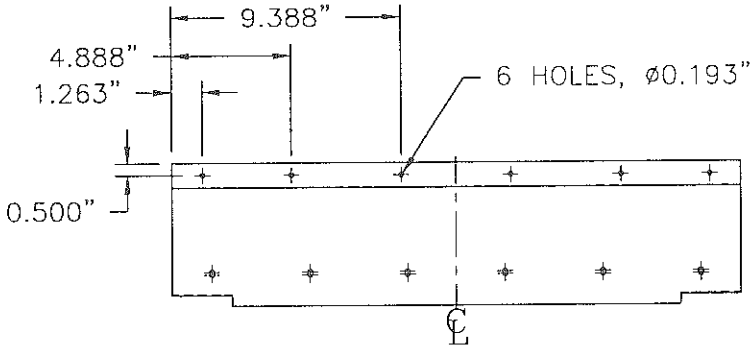
-BENDING RADIUS EQUAL : 0.031"

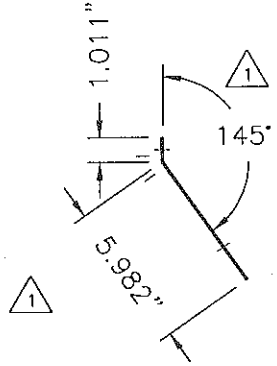
MATERIAL: HOT ROLLED STEEL 0.093"

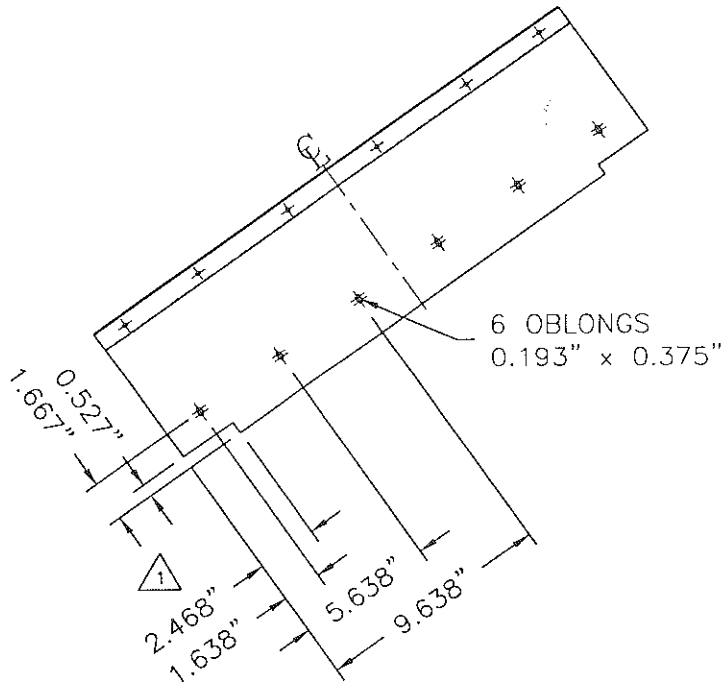
REV.	DESCRIPTION		DE:
#2	CHG. DIMENSIONS & MAT. THICKNESS	OCT. 11, 01	C.G
#1	CHG. 1 HOLES ø0.250"--->ø0.201"	MARCH 6, 01	C.G

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTEE
DESSINE/DRAWN: C. GRIMARD	TOLERANCES GENERALES
DATE: FEB. 14, 01	FRACT. ± 1/32" X.XXX ± 0.015"
ECH./SCALE: 3/32" = 1"	X.XX ± N/A ANGLE ± 2°
VERIFIE/CHECKED:	NOM/NAME: FACADE
CODE: SR2184	
PAGE: 1 of 2	REVISION #2

2184







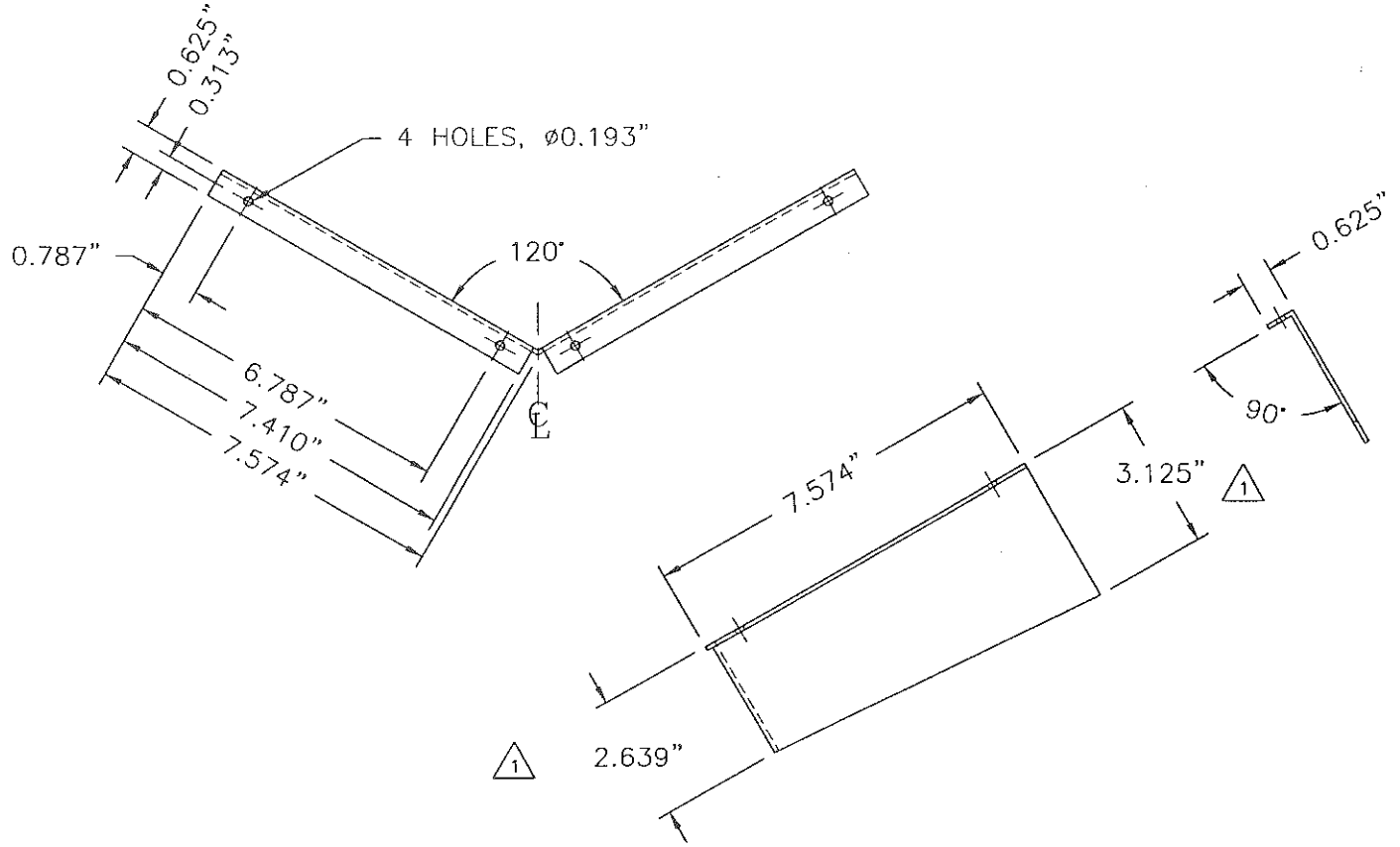
NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: [illegible] ROLLED STEEL 0.093"

REV.	DESCRIPTION	DE:
#1	UP DATE MATERIAL & DESIGN	OCT. 11, 01 C.G

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SECURITE INTERNATIONAL LTEE
DESSINE/DRAWN: C. GRIMARD	TOLERANCES GENERALES
DATE: FEB. 14, 01	FRACT. ± 1/32" X.XXX ± 0.015"
ECH./SCALE: 1/8" = 1"	X.XX ± N/A ANGLE ± 2°
VERIFIE/CHECKED:	NOM/NAME: HEAT DEFLECTOR
CODE: SR2185	
PAGE: 1 of 1	REVISION #1 DESSI PR[illegible] 2185



NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031" (1)

MATERIAL: ROLLED STEEL 0.093"

#1	CHG. MATERIAL THICKNESS	OCT. 11, 01	C.G
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: FEB. 15, 01
ECH./SCALE: 1/4" = 1"
VERIFIE/CHECKED:
CODE: SR2186
PAGE: 1 of 2

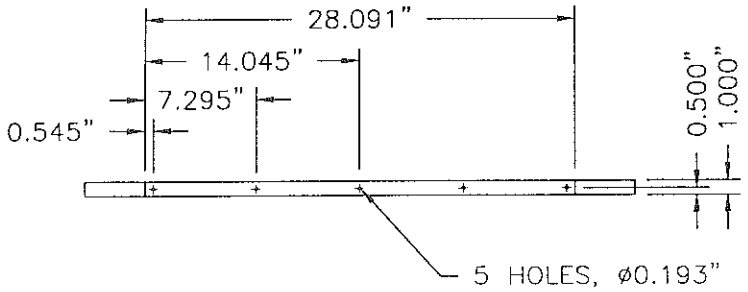
SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE

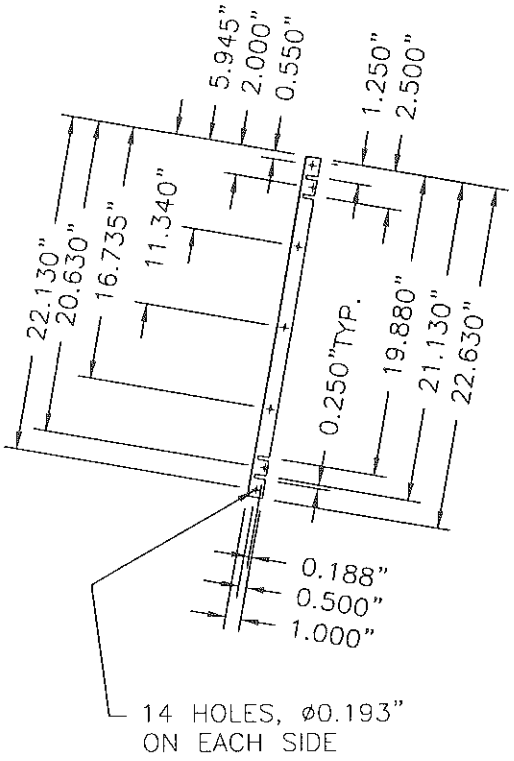
TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.015"
X.XX ± N/A | ANGLE ± 2°

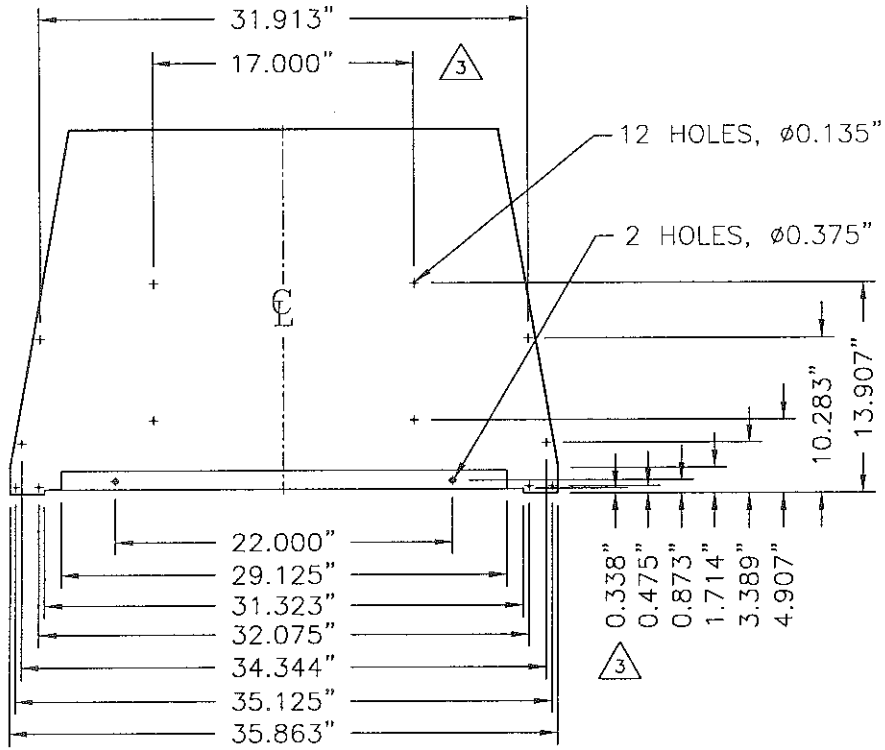
NOM/NAME: FLUE GAS BAFFLE

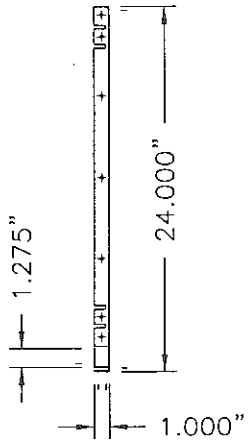
REVISION #1

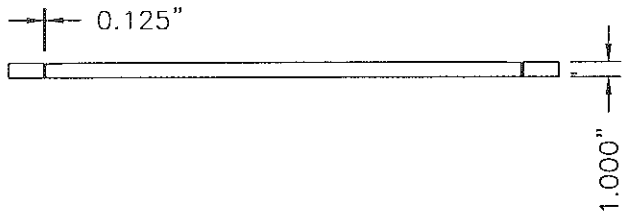
DESSI PRO 2186











NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.

- BENDING RADIUS EQUAL : 0.031"

MATERI SATIN COAT 0.050"

REV.	DESCRIPTION	DE:
#3	UP DATE BEND & HOLES	JULY 6, 01 C.G
#2	CHG. DESIGN	APRIL 2, 01 C.G

CONCU/DESIGNED	E. LAMY
DESSINE/DRAWN	C. GRIMARD
DATE	FEB. 15, 01
ECH./SCALE	5/64" = 1"
VERIFIE/CHECKED	
CODE	SR2187
PAGE	1 of 2

SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES

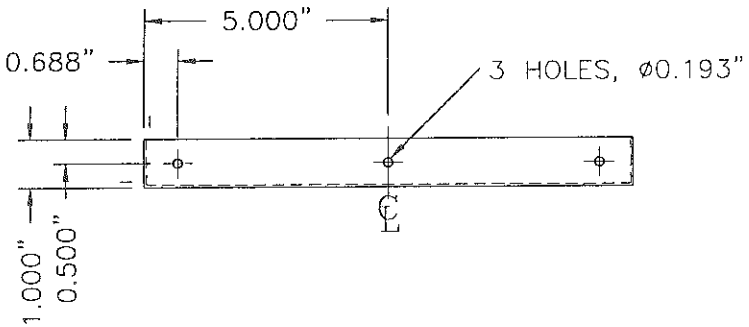
FRACT. ± 1/32" | X.XXX ± 0.015"

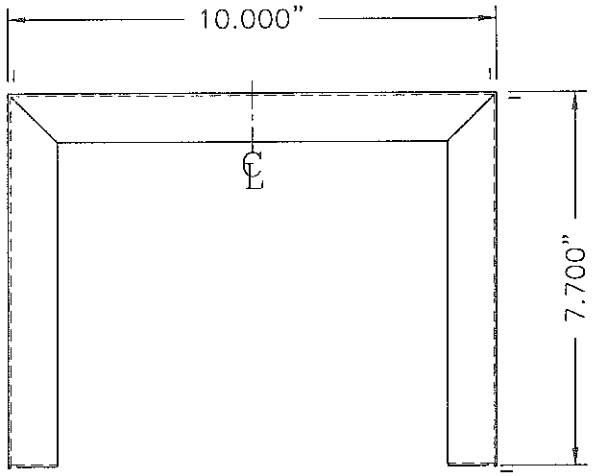
X.XX ± N/A | ANGLE ± 2°

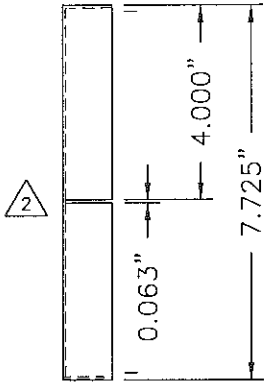
NOM/NAME: FIRE PLACE BOTTOM

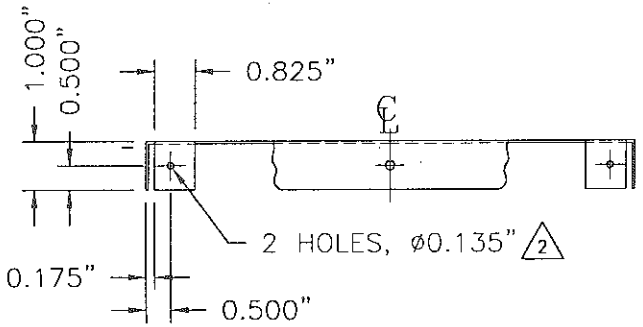
REVISION #3

DESSI PRO 2187









NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- THIS IS THE RIGHT PIECE THE LEFT PIECE IS THE MIROR OF THE RIGHT
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: SATIN CAOT 0.050"

REV.	DESCRIPTION		DE:
#2	ADDED NATCH & CHG. ø	NOV. 12, 01	C.G
1	chg side height	3-5-01	E.L.

CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: FEB. 15, 01
ECH./SCALE: 1/4" =1"
VERIFIE/CHECKED:
CODE: SR2188D SR2188G
PAGE: 1 of 2

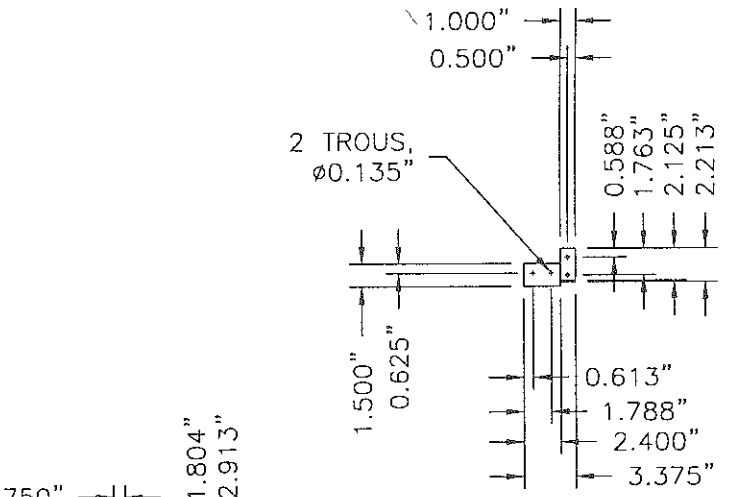
SECURITY CHIMNEYS INTERNATIONAL LTD
CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

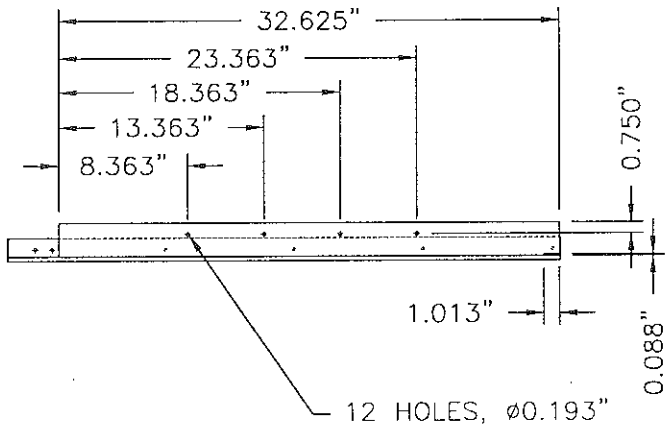
TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.015"
X.XX ± N/A | ANGLE ± 2°

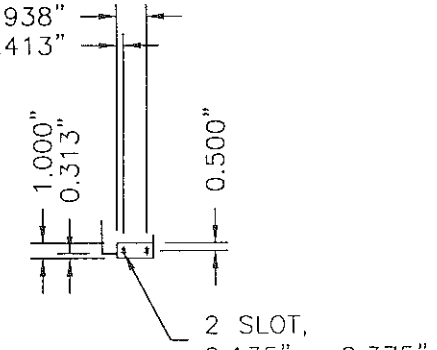
NOM/NAME: FIREBOX SUPPORT

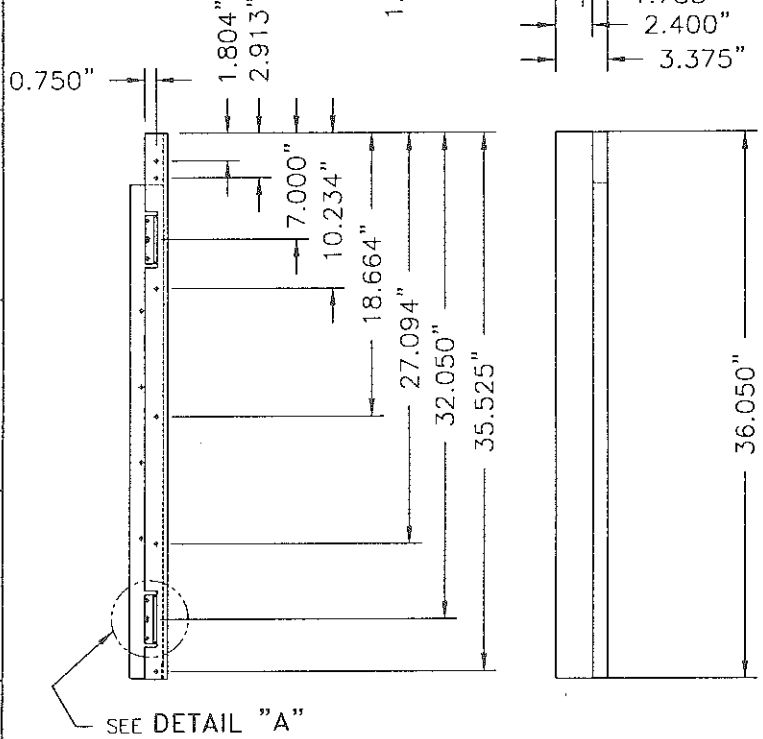
REVISION # 1

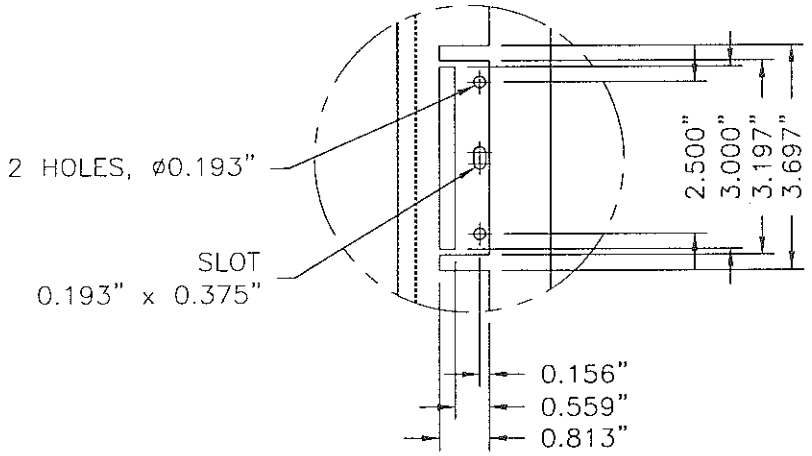
DESSI PRC 2188











4 DETAIL "A"
ZOOM 4X

NOTE:

- ALL BEND AT 90° UNLESS OTHERWISE SPECIFIED.
- THIS IS THE LEFT PIECE THE RIGHT PIECE IS THE MIROR OF THE LEFT
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: IN COAT 0.025"

REV.	DESCRIPTION	DE:
#4	ADDED FLAPS FOR GYPROC	NOV. 12, 01 C.G

CONCU/DESIGNED	E. LAMY
DESSINE/DRAWN	C. GRIMARD
DATE	FEB. 15, 01
ECH./SCALE	5/64" = 1"
VERIFIE/CHECKED	
CODE	SR2189G SR2189D
PAGE	1 of 2

SECURITY CHIMNEYS INTERNATIONAL LTD — CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES

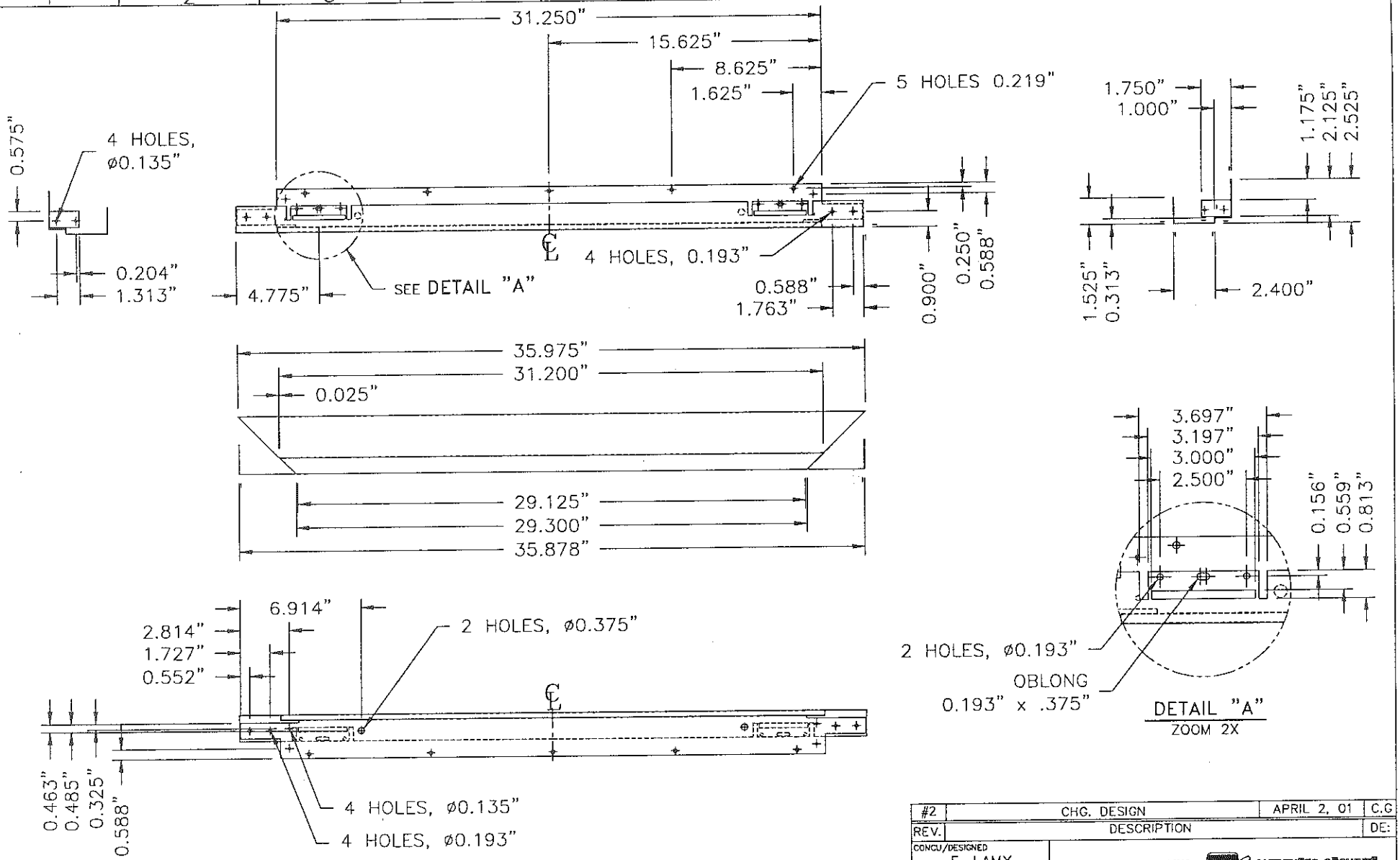
FRACT. ± 1/32" | X.XXX ± 0.015"

X.XX ± N/A | ANGLE ± 2°

NOM/NAME: FACADE SIDE FRAME

REVISION #4

DESSIN PRO 2189



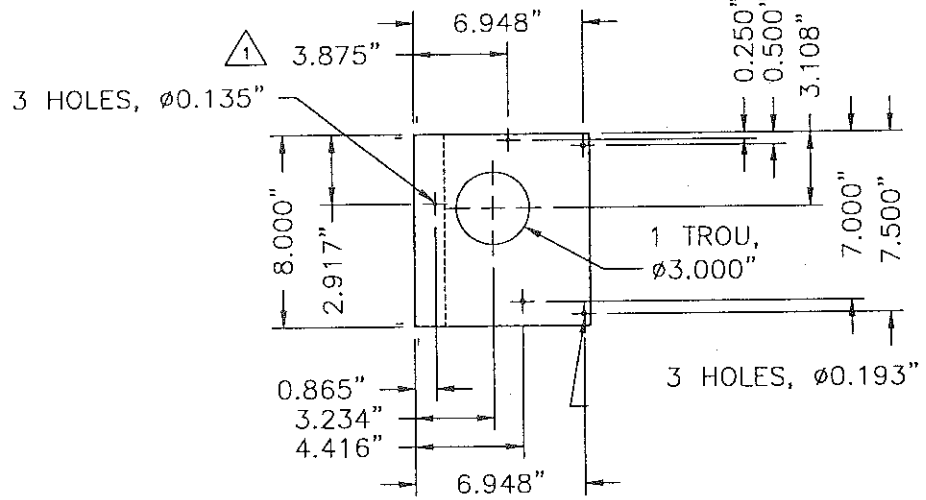
NOTE:

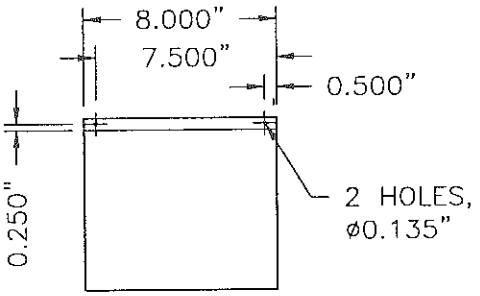
- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- ALL BEND AT 90° UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

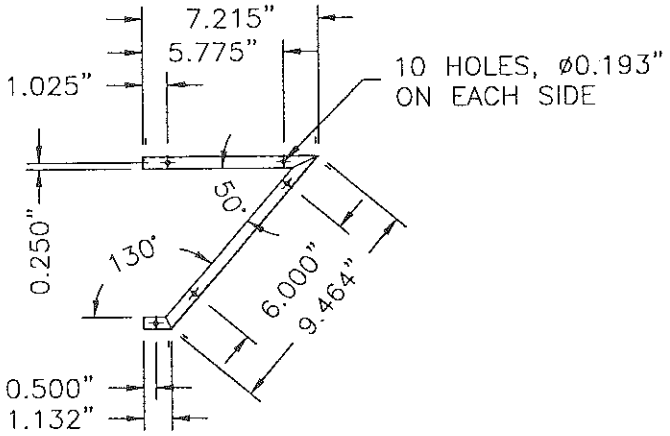
MATERIAL: TIN COAT 0.025"

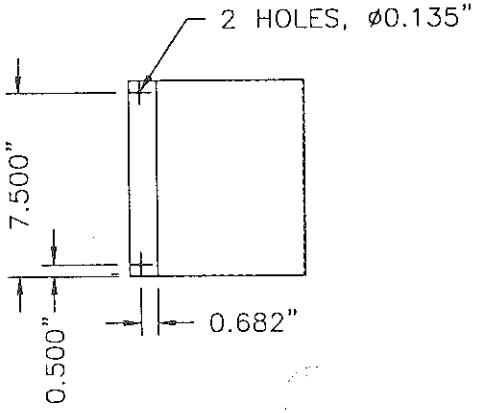
#2	CHG. DESIGN	APRIL 2, 01	C.G
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINE/DRAWN: C. GRIMARD	
DATE: FEB. 15, 01	TOLERANCES GENERALES
ECH./SCALE: 1/8" = 1"	FRACT. ± 1/32" X.XXX ± 0.015" X.XX ± N/A ANGLE ± 2°
VERIFIE/CHECKED:	NOM/NAME: FACADE SIDE FRAME
CODE: SR2190	
PAGE: 1 of 2	REVISION: #2 DESSIN: PRO 2190









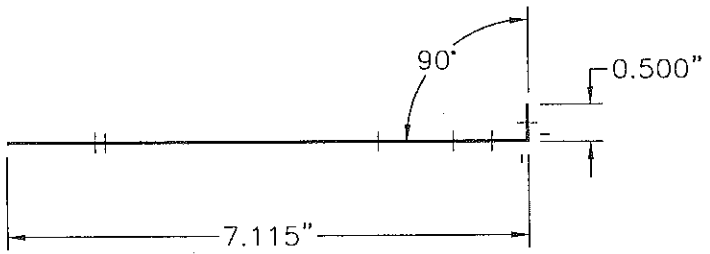
NOTE:

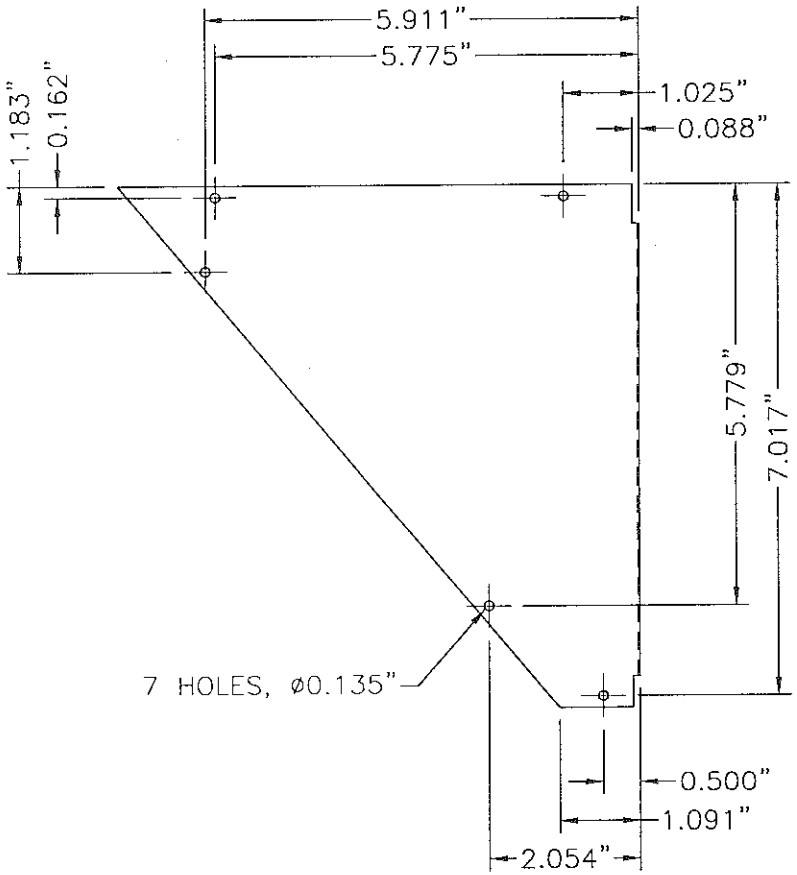
-THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.

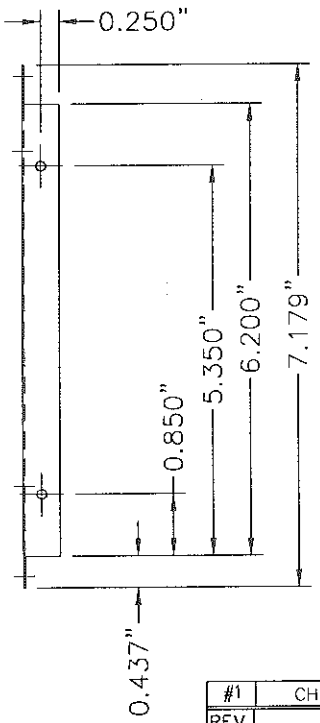
-BENDING RADIUS EQUAL : 0.031"

MATEF SATIN COAT 0.025"

#1			C.G
REV.	DESCRIPTION		DE:
CONCU/DESIGNED: E. DUFOUR	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE		
DESSINE/DRAWN: C. GRIMARD			
DATE: FEB. 16, 01	TOLERANCES GENERALES		
ECH./SCALE: 1/8" = 1"	FRACT. ± 1/32"	X.XXX ± 0.015"	
VERIFIE/CHECKED	X.XX ± N/A	ANGLE ± 2°	
	NOM/NAME: PRIMARY AIR BOX		
CODE: SR2191			
PAGE: 1 of 2	REVISION: #1	DESSIN: PRC 2191	







NOTE:

- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: SATIN COAT 0.025"

#1	CHG. DIMENSIONS & HOLES POSITIONS	OCT. 18, 01	C.G
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: FEB. 16, 01
ECH./SCALE: 3/8" = 1"
VERIFIE/CHECKED:
CODE: SR2192
PAGE: 1 of 2

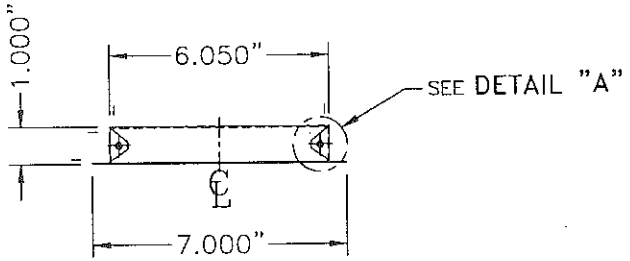
SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE

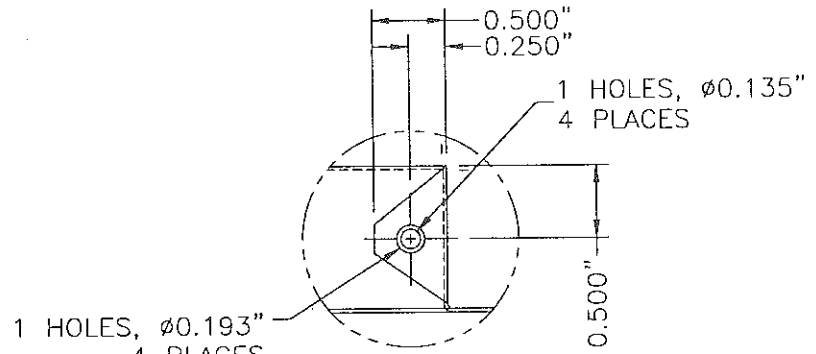
TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.015"
X.XX ± N/A | ANGLE ± 2°

NOM/NAME: PRIMARY AIR, CONTROL BOX SIDE

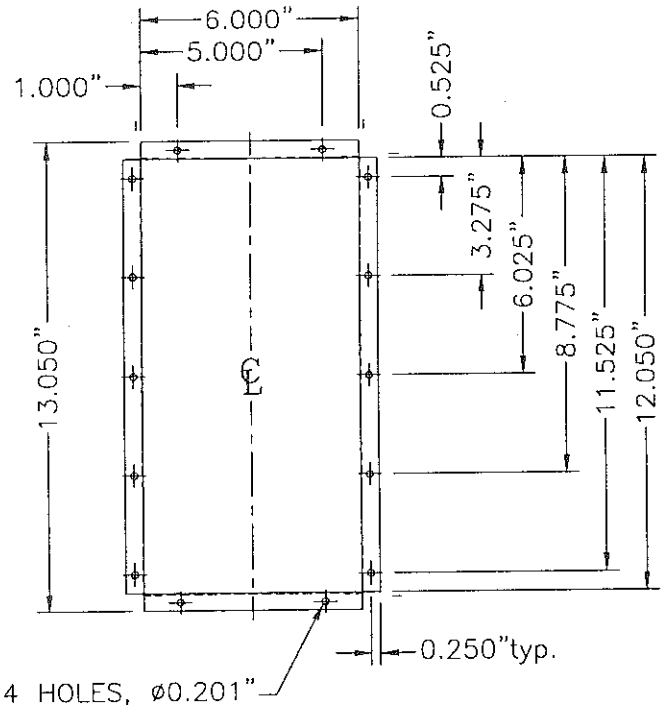
REVISION #1

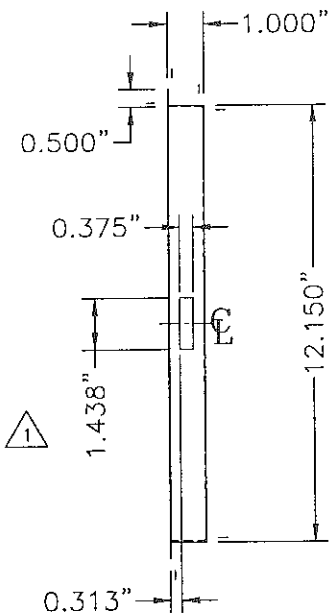
DESSIN/DWG: PROTO 2192





DETAIL "A"
ZOOM 4X





NOTE:
- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.

- BENDING RADIUS EQUAL : 0.031"

MATERIAL: SATIN COAT 0.025"

#1	CHG. DIM. FOR SLOT & HOLES ø	NOV. 26, 01	C.G
REV.	DESCRIPTION		DE:

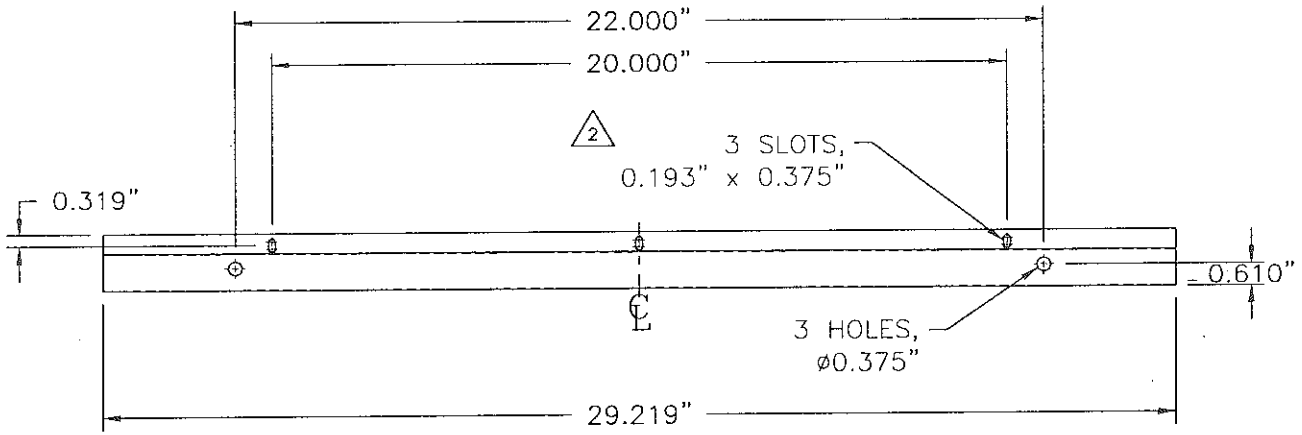
CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: FEB. 16, 01
ECH./SCALE: 3/16" = 1"
VERIFIE/CHECKED:
CODE: SR2193
PAGE: 1 of 2

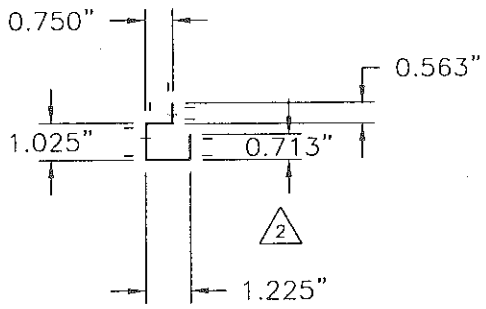
SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.015"
X.XX ± N/A | ANGLE ± 2°

NOM/NAME: SECONDARY AIR BOX

REVISION #1
DESSIN/DWG: PROTO 2193





NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- ALL BEND AT 90° UNLESS OTHERWISE SPECIFIED
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: SATIN COAT 0.025"

REV.	DESCRIPTION	DATE	DE:
#2	CHG. HOLES FOR SLOTS	JUNE 9, 01	C.G
#1	CHG. DIMENSIONS	APRIL 2, 01	C.G

CONCU/DESIGNED	E. LAMY
DESSINE/DRAWN	C. GRIMARD
DATE	MARCH 8, 01
ECH./SCALE	3/16" = 1"
VERIFIE/CHECKED	
CODE	SR2194
PAGE	1 of 2

SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES

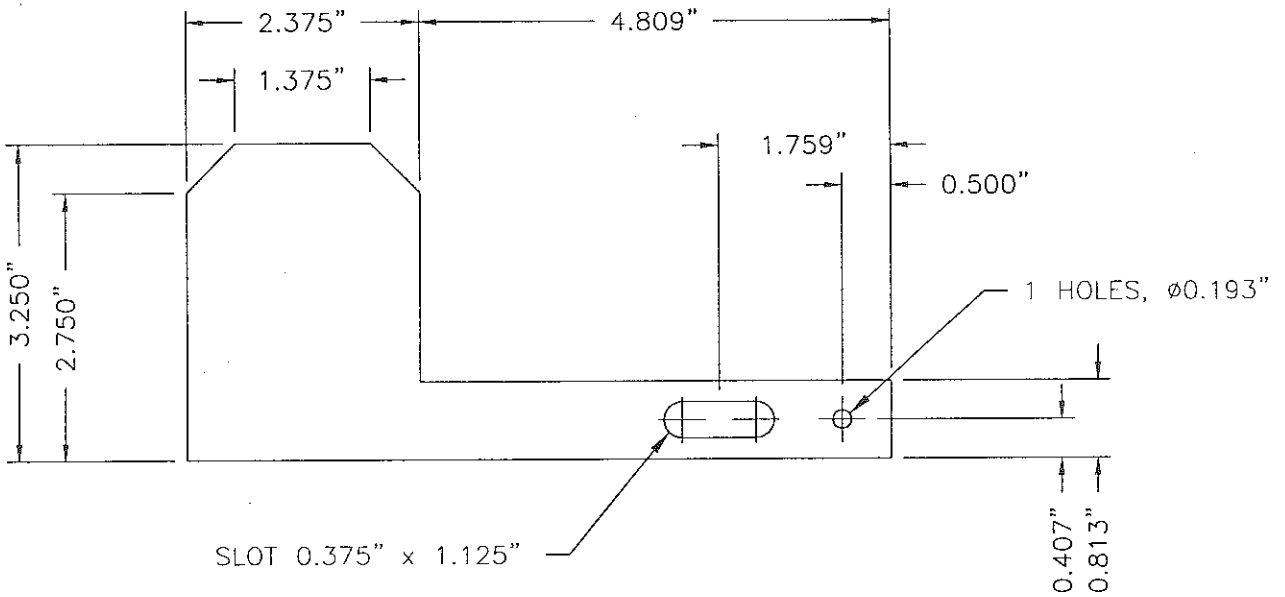
FRACT. ± 1/32" | X.XXX ± 0.005"

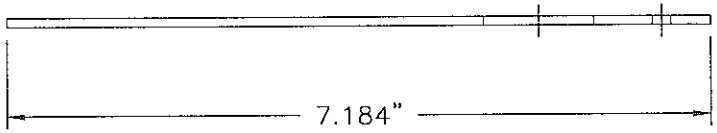
X.XX ± N/A | ANGLE ± 2°

NOM/NAME: FACADE CAPING

REVISION: #2

DESSIN/DWG: PROTO 2194





MATERIAL: HOT ROLLED STEEL 0.119"

#2	CHG. DESIGN	NOV. 12, 01	C.G
REV.	DESCRIPTION		DE:

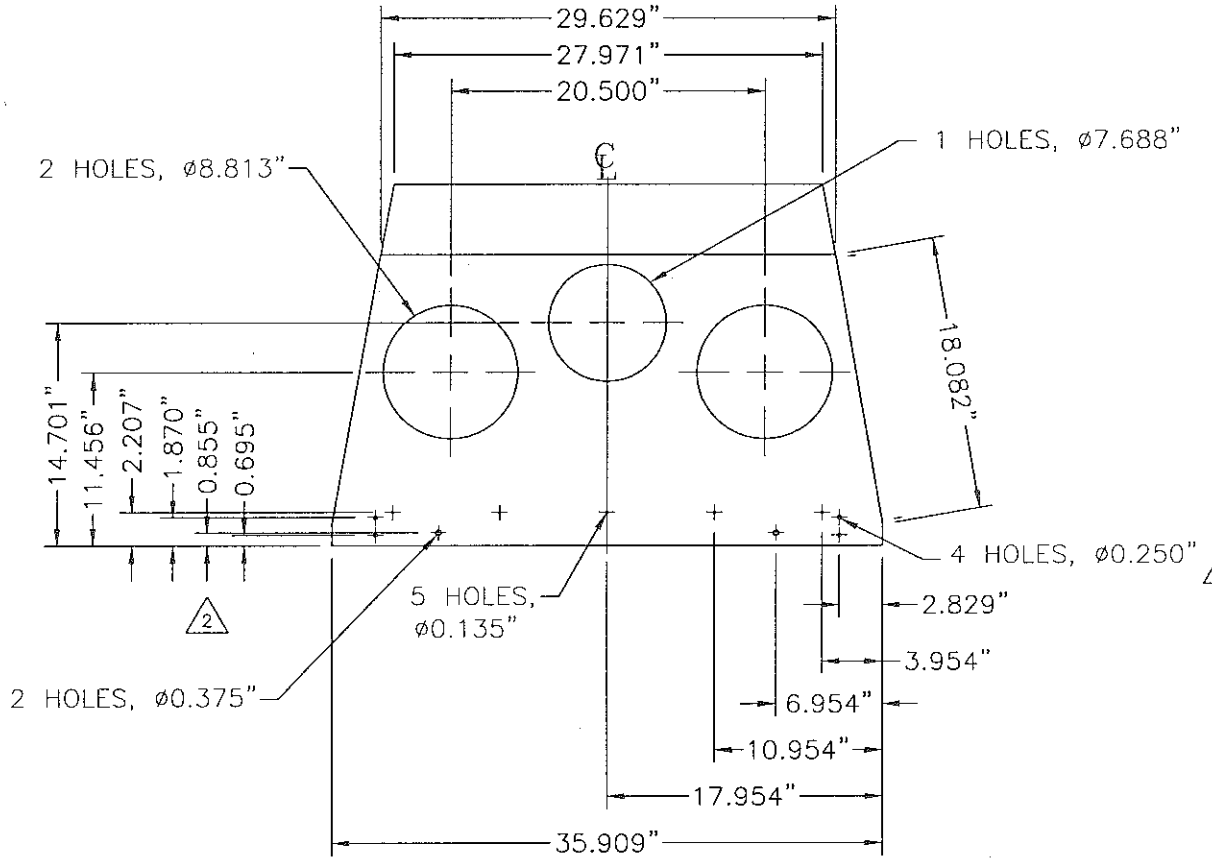
CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: FEB. 8, 01
ECH./SCALE: 3/8" = 1"
VERIFIE/CHECKED:
CODE: SR2195
PAGE: 1 of 1

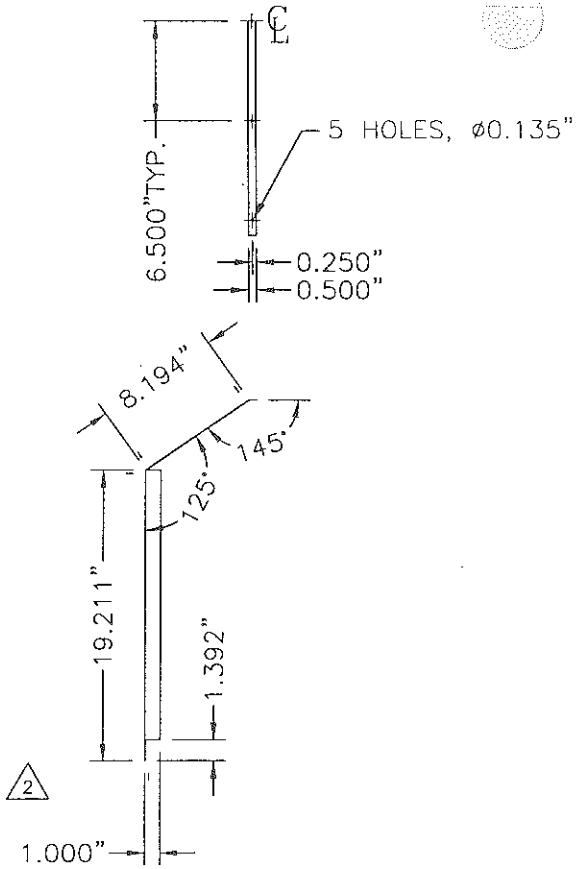
SECURITY CHIMNEYS INTERNATIONAL LTD
CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.015"
X.XX ± N/A | ANGLE ± 2°

NOM/NAME: PRIMARY AIR CONTROL REGISTER

REVISION: #2
DESSIN/DWG: PROTO 2195





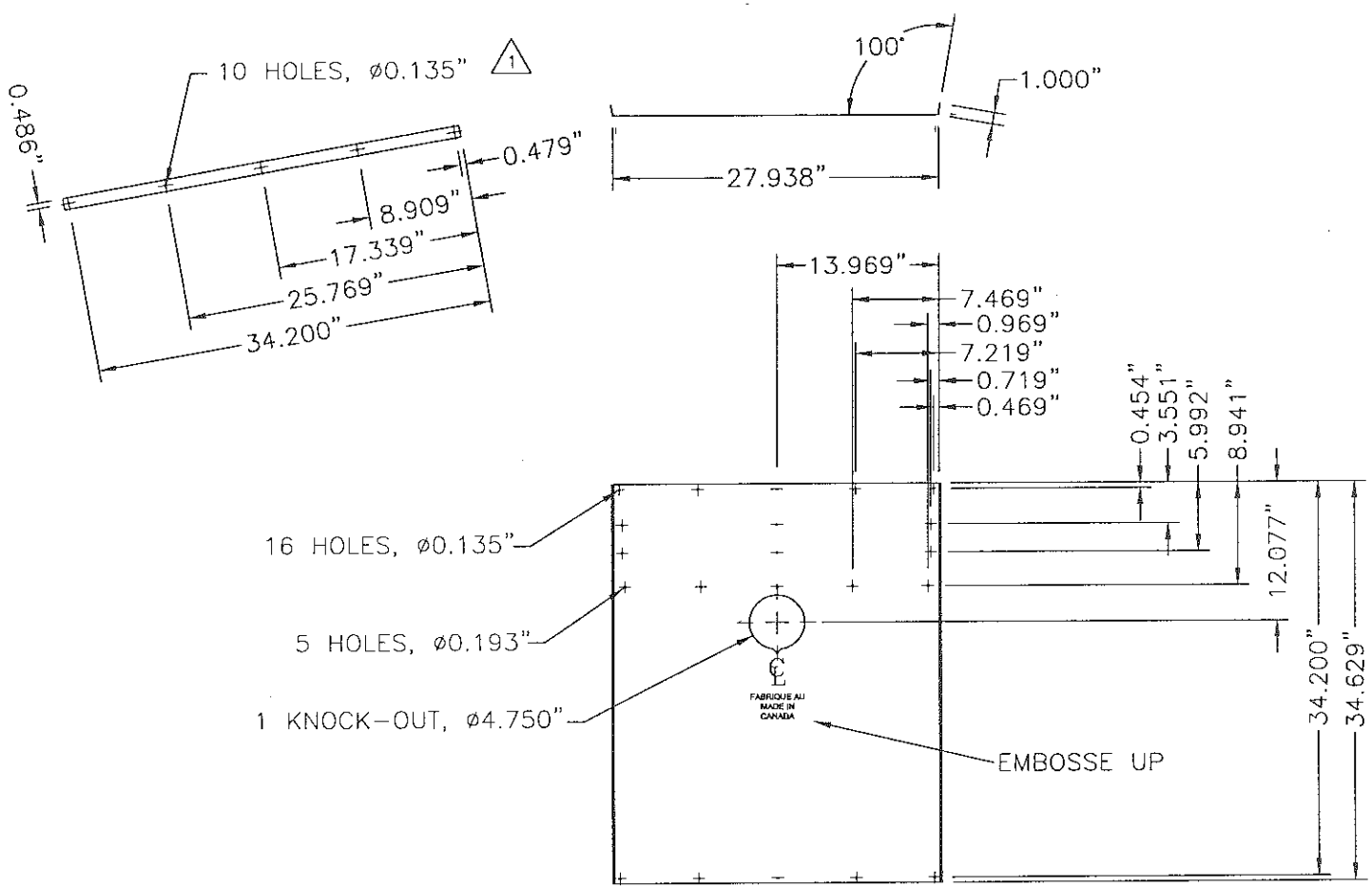
NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- ALL BEND AT 90° UNLESS OTHERWISE SPECIFIED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: GALVANIZED 0.021"

REV.	DESCRIPTION	DE:
#2	REMOVE 2 HOLES & CHG. DIMENSIONS	JULY 5, 01 C.G
#1	UP DATE HOLES	MARCH 8, 01 C.G

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINE/DRAWN: C. GRIMARD	
DATE: FEB. 20, 01	TOLERANCES GENERALES: FRACT. ± 1/32" | X.XXX ± 0.015"
ECH./SCALE: 5/64" = 1"	X.XX ± N/A | ANGLE ± 2°
VERIFIE/CHECKED:	NOM/NAME: INSULATION SUPPORT
CODE: SR2196	
PAGE: 1 of 2	REVISION: #2 | DESSIN/DWG: PROTO 2196



NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: GALVANIZED STEEL 0.021"

#1	CHG. 10 HOLE ø0.193"---> ø0.135"	MARCH 6, 01	C.G
REV.	DESCRIPTION		DE:

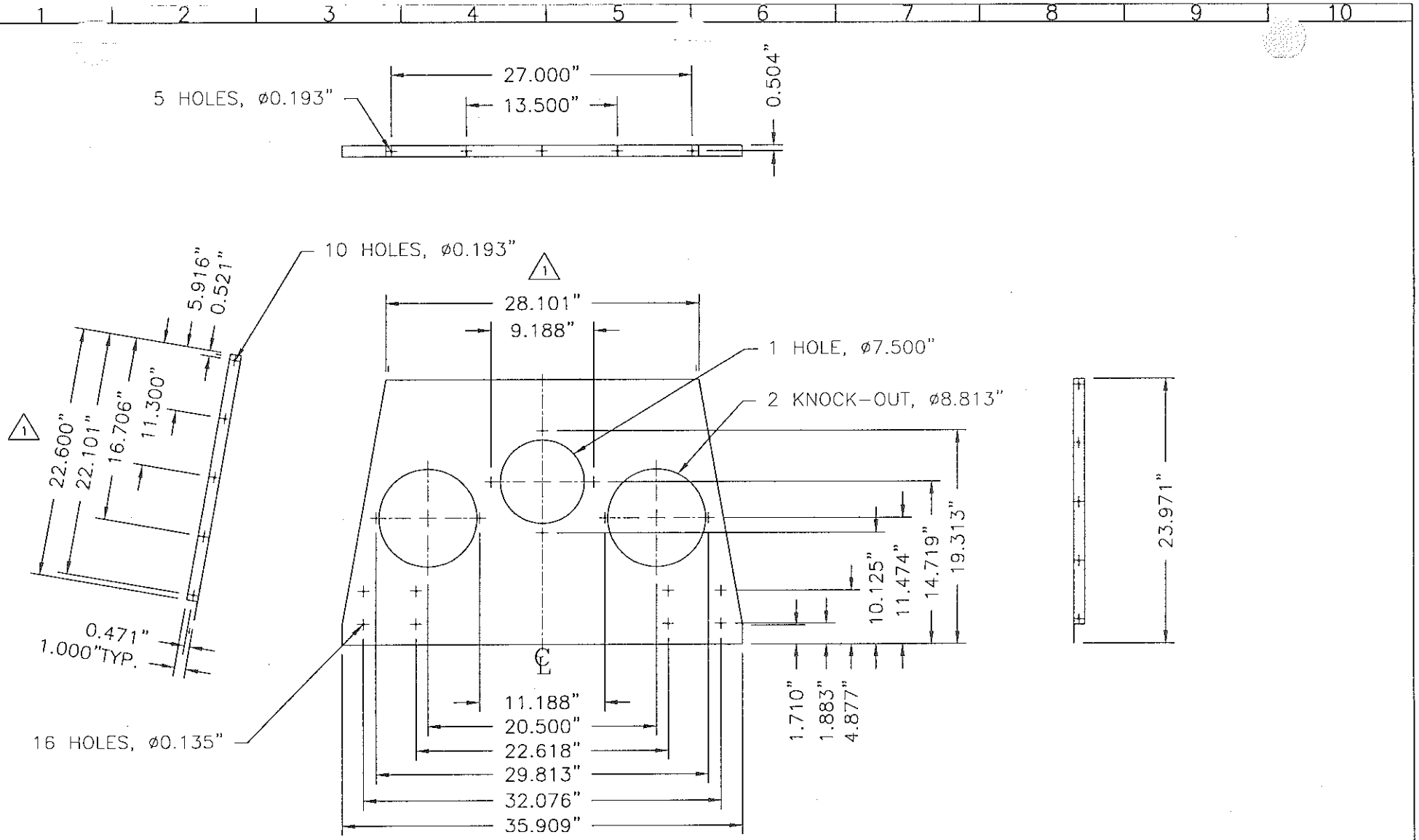
CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: FEB. 20, 01
ECH./SCALE: 1/16" = 1"
VERIFIE/CHECKED:
CODE: SR2197
PAGE: 1 of 2

SECURITY CHIMNEYS INTERNATIONAL LTD
CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.001"
X.XX ± N/A | ANGLE ± 2°

NOM/NAME: FIREPLACE BACK PANEL

REVISION: #1
DESSIN/DWG: PROTO 2197



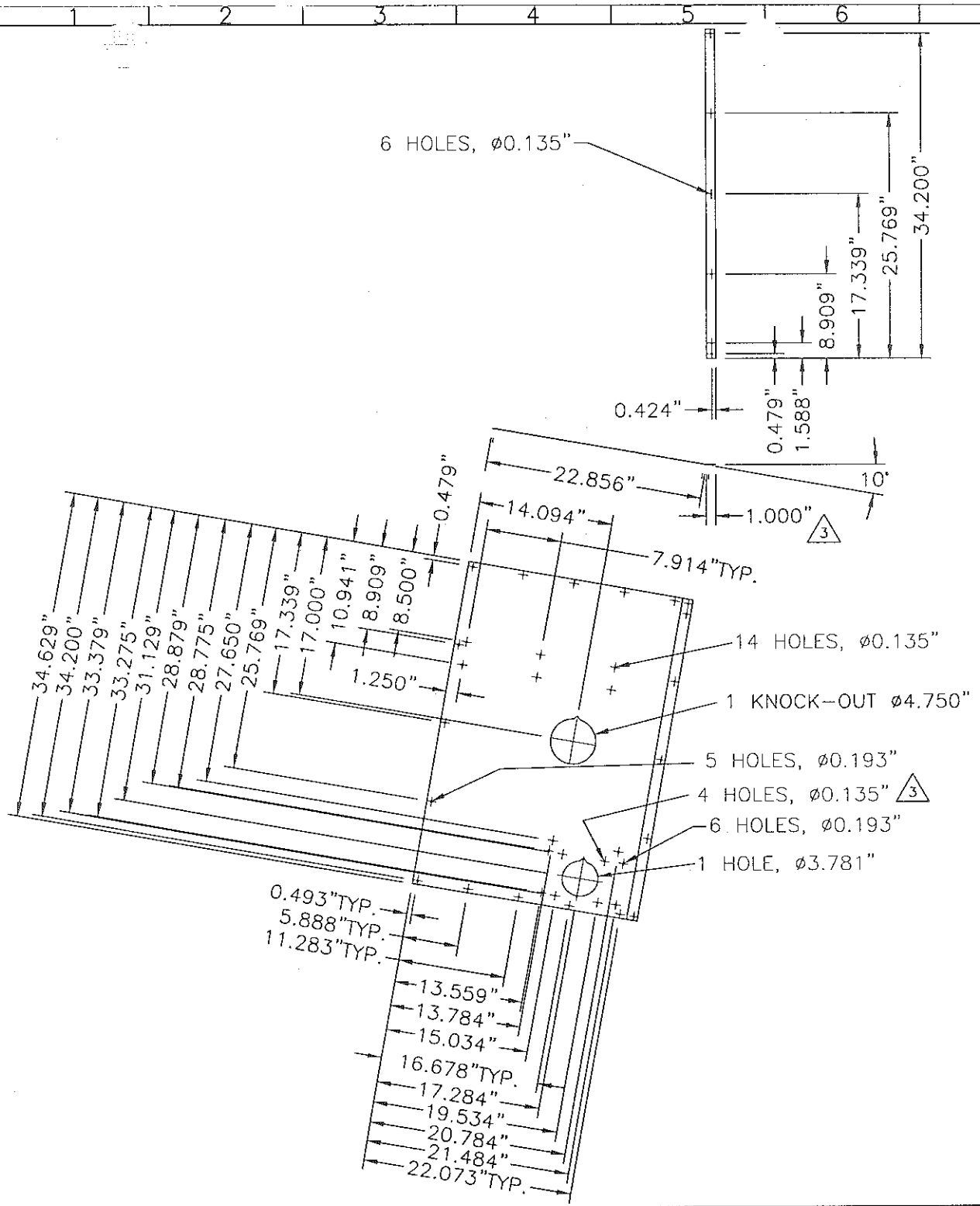
NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- ALL BEND AT 90° UNLESS OTHERWISE SPECIFIED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: GALVANIZED STEEL 0.021"

REV.	DESCRIPTION	DE:
#1	CHG. DESIGN & UP DATE HOLES	MARCH 8, 01 C.G

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE
DESSINE/DRAWN: C. GRIMARD	TOLERANCES GENERALES
DATE: FEB. 20, 01	FRACT. ± 1/32" X.XXX ± 0.015"
ECH./SCALE: 5/64" = 1"	X.XX ± N/A ANGLE ± 2°
VERIFIE/CHECKED:	NOM/NAME: FIREPLACE TOP
CODE: SR2198	
PAGE: 1 of 2	REVISION #1 DESSIN/DWG PROTO 2198



NOTE:

-THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.

-BENDING RADIUS EQUAL : 0.031"

MATERIAL: GALVANIZED STEEL 0.021"

REV.	DESCRIPTION	DATE	DE:
#3	ADDED 4 HOLES & CHG. DIMENSION	NOV. 12, 01	C.G
#2	ADD 1 HOLE ø0.135"	JULY 5, 01	C.G
#1	CHG. 5 HOLES ø0.135"---->ø0.193"	MARCH 6, 01	C.G

CONCU/DESIGNED	E. LAMY
DESSINÉ/DRAWN	C. GRIMARD
DATE	FEB. 20, 01
ECH./SCALE	1/16" = 1"
VERIFIÉ/CHECKED	
CODE	SR2199
PAGE	1 of 2

SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES

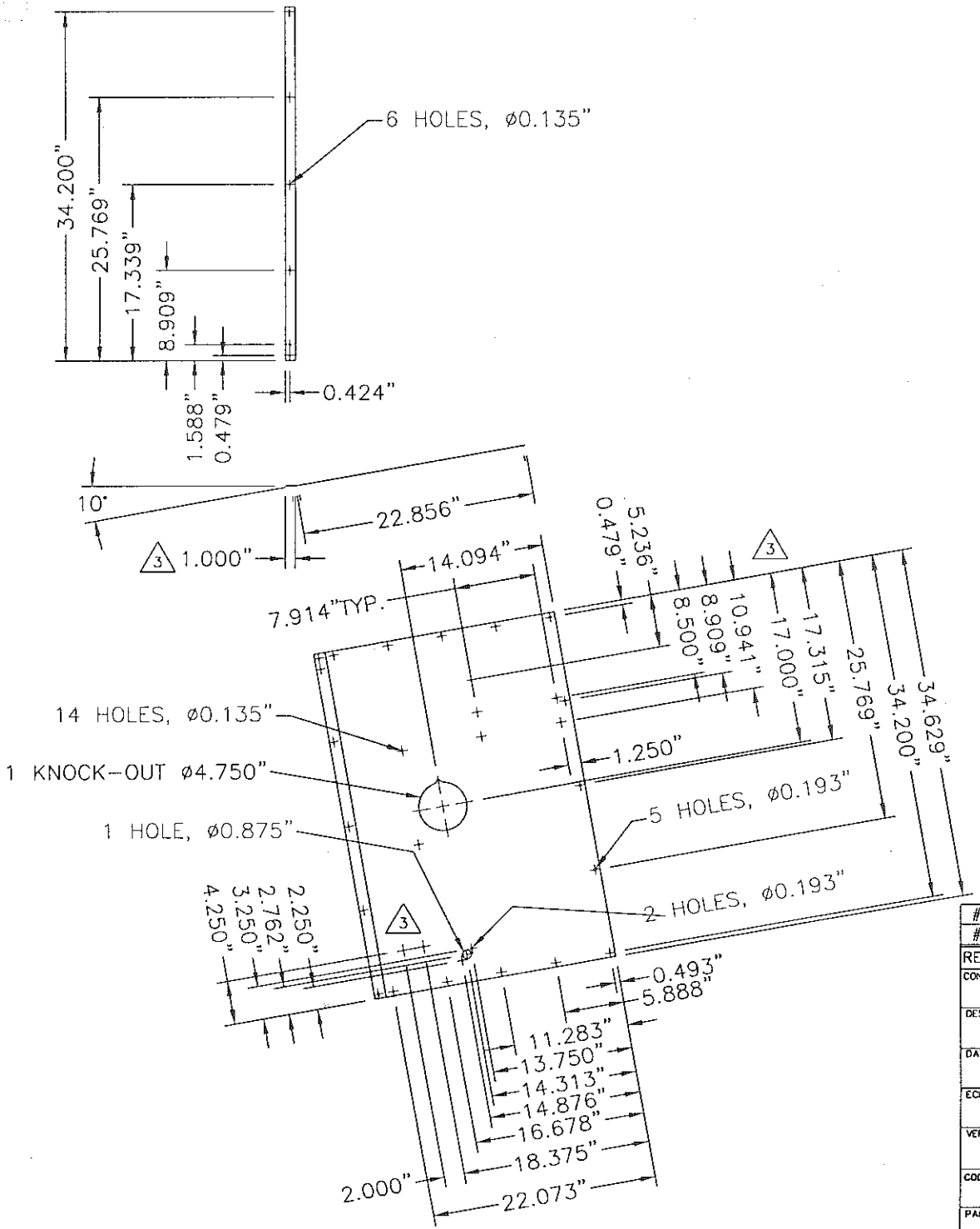
FRACT. ± 1/32" | X.XXX ± 0.015"

X.XX ± N/A | ANGLE ± 2°

NOM/NAME: FIREPLACE LEFT SIDE PANEL

REVISION #2

DESSIN/DWG: PROTO 2199



NOTE:

- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: GALVANIZED STEEL 0.021"

REV.	DESCRIPTION	DATE	DE:
#3	CHG. DIMENSIONS & ADD 2 HOLES ø0.135"	NOV. 12, 01	C.G
#2		JULY 5, 01	C.G

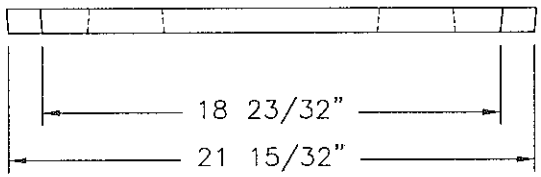
CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: FEB. 21, 01
ECH./SCALE: 1/16" =1"
VERIFIE/CHECKED:
CODE: SR2200
PAGE: 1 of 2

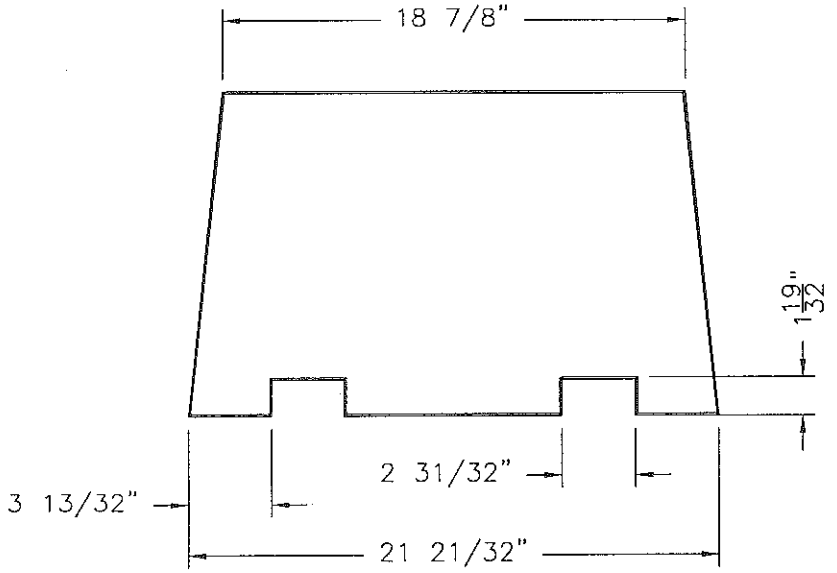
SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

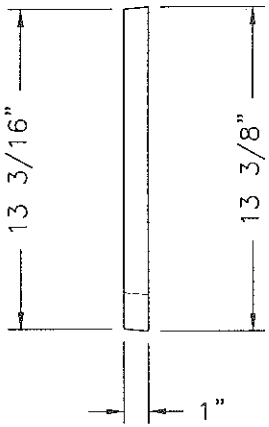
TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.015"
X.XX ± N/A | ANGLE ± 2°

NOM/NAME: FIREPLACE RIGHT SIDE PANEL

REVISION: #3
DESSIN/DWG: PROTO 2200







NOTE:

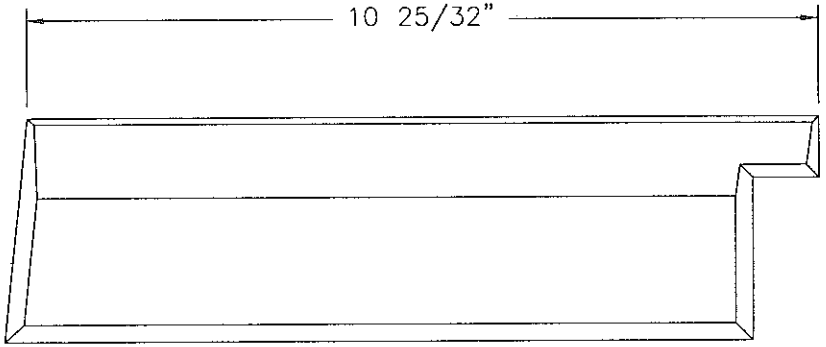
-ALL FILLET R=1/8"

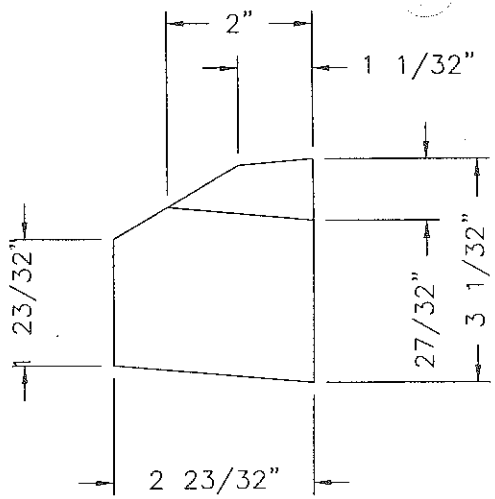
-MOLDING ANGLE OF 5 °

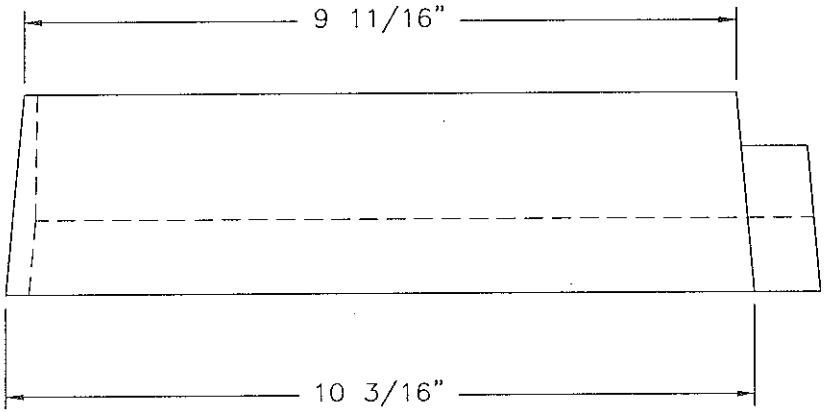
MATERIAL: REFRACTORY CEMENT

#1	CHG. SHAPE	OCT. 26, 01	E.L.
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINÉ/DRAWN: C. GRIMARD	
DATE: FEB. 23, 01	TOLERANCES GENERALES: FRACT. ± 1/16" X.XX ± N/A X.XXX ± N/A ANGLE ± 2°
ECH./SCALE: 1/8" = 1"	
VERIFIÉ/CHECKED:	NOM/NAME: BOTTOM REFRACTORY
CODE: SR2201	
PAGE: 1 of 1	REVISION #1 — DESSIN/DWG: PROTO 2201







NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THIS IS THE LEFT PIECE THE RIGHT PIECE IS THE MIROR OF THE LEFT.
- ALL FILLET R=1/8"

MATERIAL: REFRACTORY CEMENT

#1	CHG. DESIGN	OCT. 29, 01	C.G
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: FEB. 23, 01
ECH./SCALE: 3/8" = 1"
VERIFIE/CHECKED:
CODE: SR2202G SR2202D
PAGE: 1 of 1

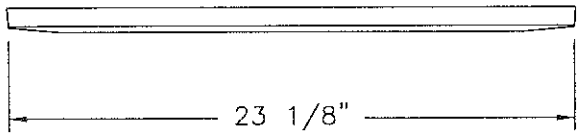
SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SECURITE INTERNATIONAL LTEE

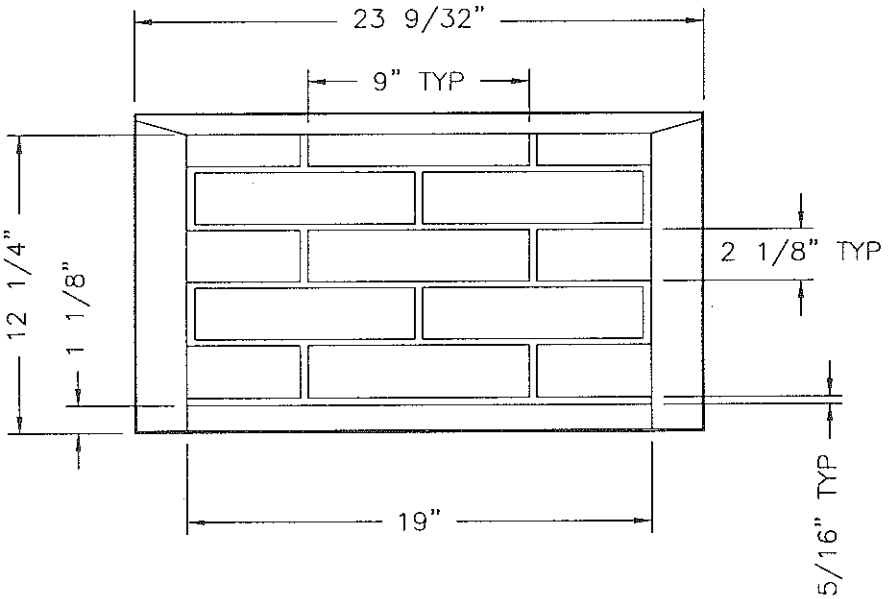
TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± N/A
X.XX ± N/A | ANGLE ± 2°

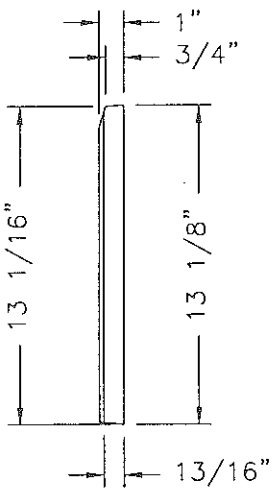
NOM/NAME: FRONT REFRACTORY

REVISION #1

DESSIN/DWG: PROTO 2202







NOTE:

-ALL FILLET R=1/8"

MATERIAL: REFRACTORY CEMENT

#1	UP DATE	MO-JO-AN	E.L.
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: FEB. 23, 01
ECH./SCALE: 1/8" = 1"
VERIFIE/CHECKED:
CODE: SR2203
PAGE: 1 of 1

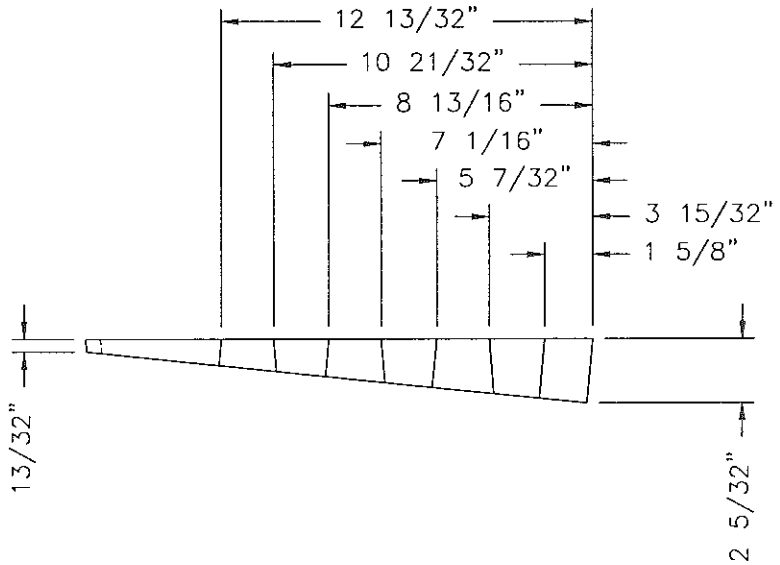
SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

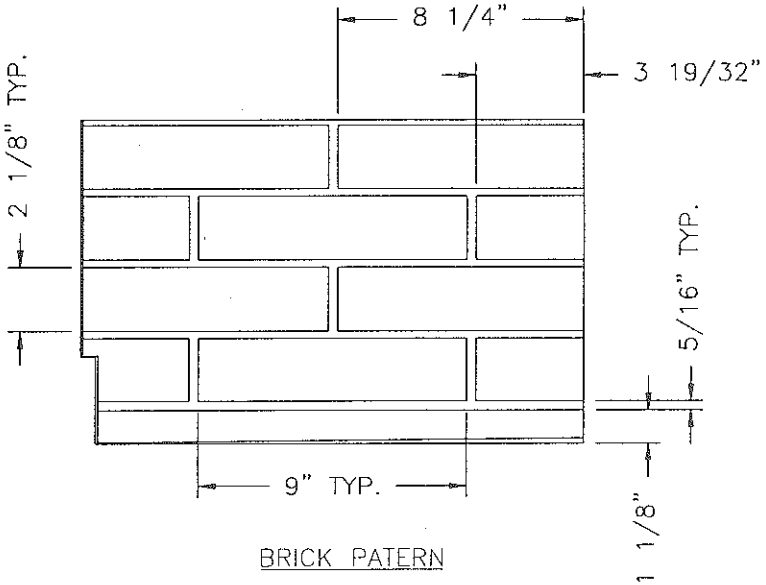
TOLERANCES GENERALES
FRACT. ± 1/16" | X.XXX ± N/A
X.XX ± N/A | ANGLE ± 2°

NOM/NAME: BACK REFRACTORY

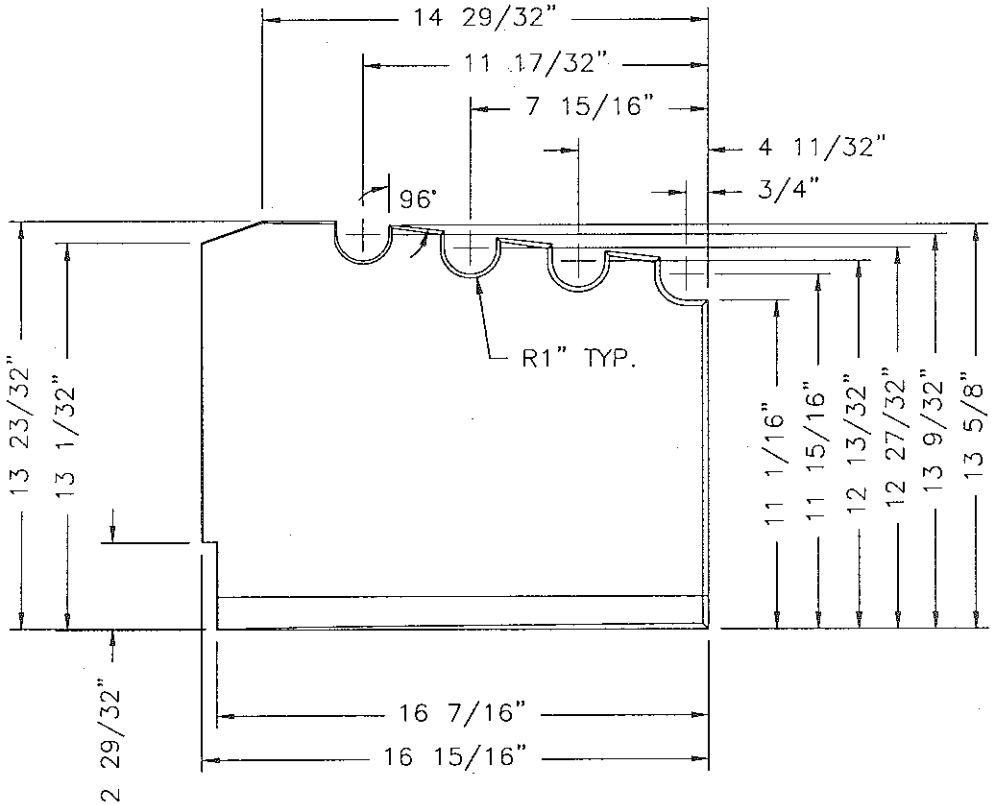
REVISION: 1

DESSIN/DWG: PROTO 2203





BRICK PATERN



NOTE:

- THIS IS THE RIGHT PIECE THE LEFT PIECE IS THE MIROR OF THE RIGHT
- ALL CORNERS AND ROUND EDGES ARE AT R=1/8"
- REMOUVAL ANGLE FROM IS 5°

MATERIAL:

#1	CHG. DESIGN	OCT. 30, 01	C.G
REV.	DESCRIPTION		DE:

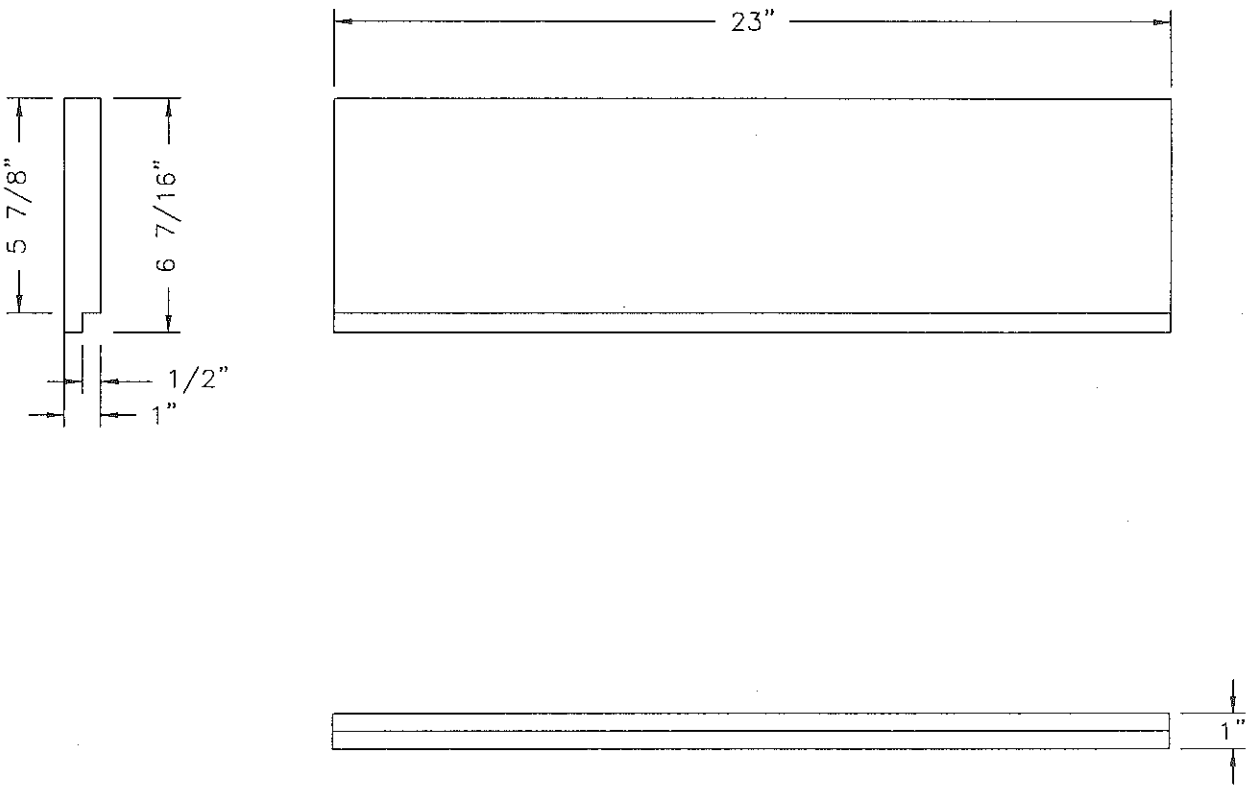
CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: FEB. 23, 01
ECH./SCALE: 5/32" = 1"
VERIFIE/CHECKED:
CODE: SR2204G SR2204D
PAGE: 1 of 1

SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES
FRACT. ± 1/16" | X.XXX ± N/A
X.XX ± N/A | ANGLE ± 2°

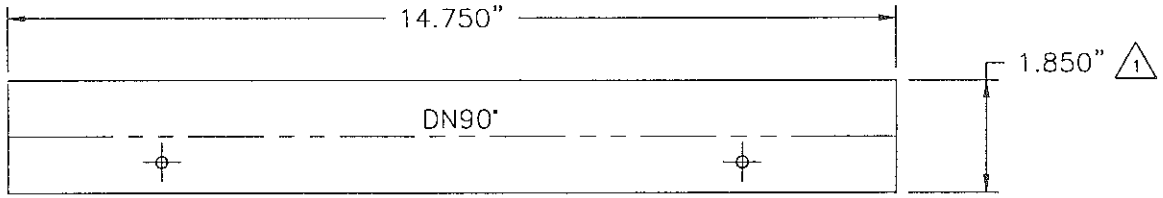
NOM/NAME: SIDE REFRACTORY

REVISION: #1
DESSIN/DWG: PROTO 2204

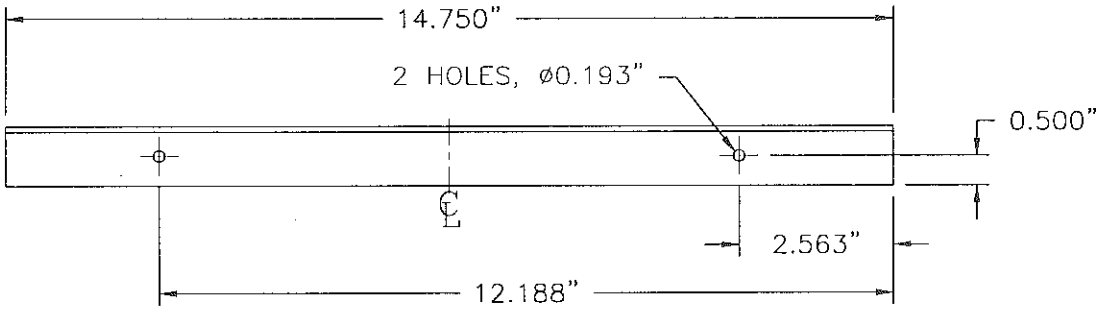


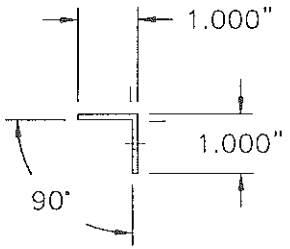
MATERIAL: CERAMIC FIBER M-BOARD (14-17 LBS/CUB_FT)

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: FEB. 26, 01	TOLERANCES GENERALES: FRACT. ± 1/16" | X.XXX ± N/A; X.XX ± N/A | ANGLE ± 2°	
ECH./SCALE: 3/16" = 1"		
VERIFIE/CHECKED:	NOM/NAME: FLUE GASES DEFLECTOR	
CODE: SR2205		
PAGE: 1 of 1	REVISION:	DESSIN/DWG: PROTO 2205



UNFOLD:





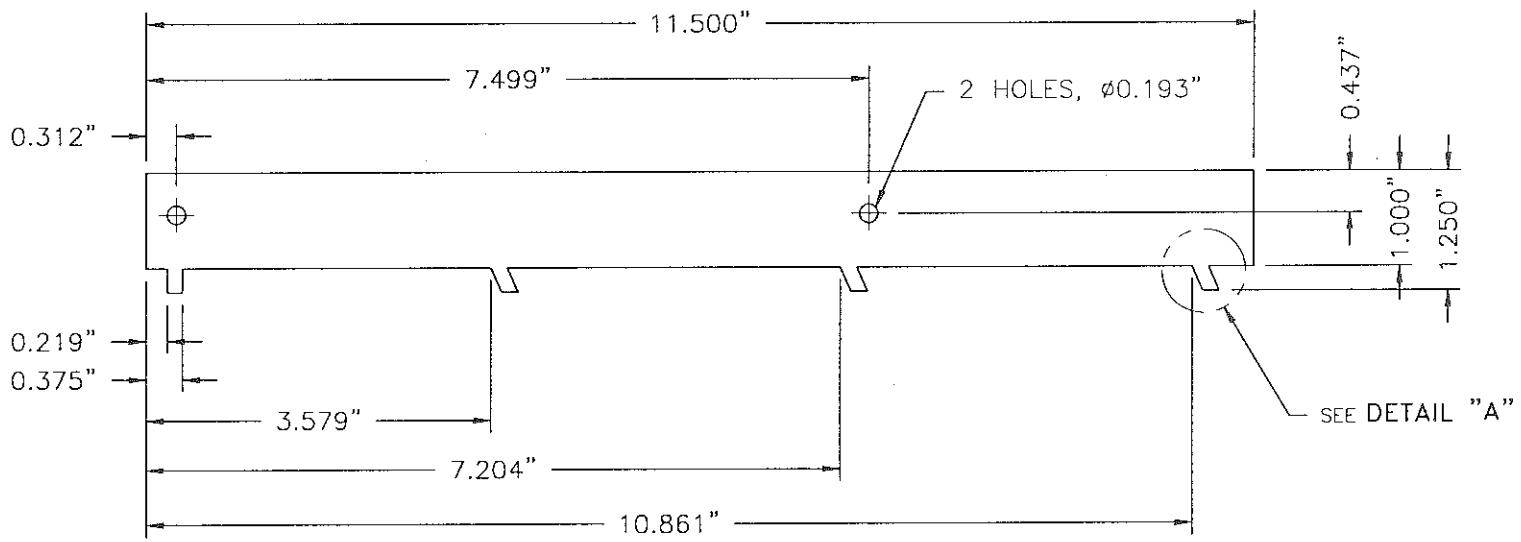
NOTE:

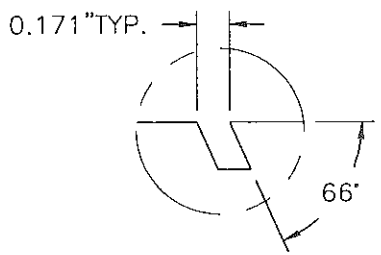
- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: HOT ROLLED STEEL 0.093" 1

REV.	DESCRIPTION	DATE	DE:
#1	CHG. MATERIAL THICKNESS	OCT. 17, 01	C.G

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINÉ/DRAWN: C. GRIMARD	
DATE: JUNE 21, 01	TOLERANCES GENERALES
ECH./SCALE: 5/16" = 1"	FRACT. ± 1/32" | X.XXX ± 0.015"
VERIFIÉ/CHECKED:	X.XX ± N/A | ANGLE ± 2°
CODE: SR2213	NOM/NAME: FIREBOX REINFORCEMENT SUPPORT
PAGE: 1 of 1	REVISION #1 | DESSIN/DWG: PROTO 2213

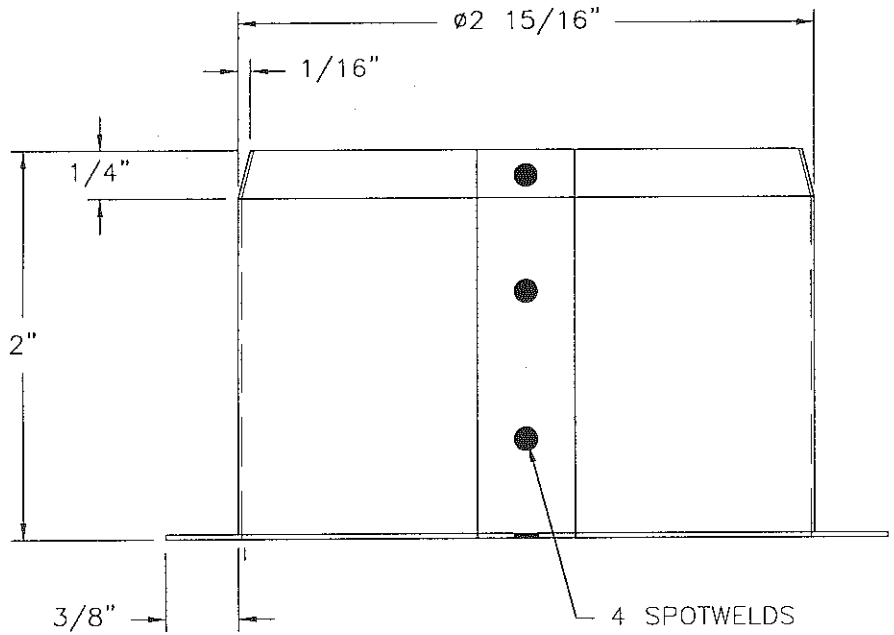


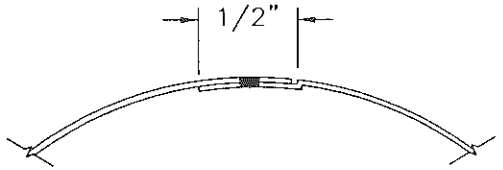


DETAIL "A"
ZOOM 2X

MATERIAL: SS. 304 0.050"

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD		
DATE: JUNE 21, 01	TOLERANCES GENERALES: FRACT. ± 1/32" X.XXX ± 0.015"	
ECH./SCALE: 1/2" = 1"	X.XX ± N/A ANGLE ± 2°	
VERIFIÉ/CHECKED:	NOM/NAME: TUBES LOCK PLATE	
CODE: SR2214		
PAGE: 1 of 1	REVISION:	DESSIN/DWG: PROTO 2214

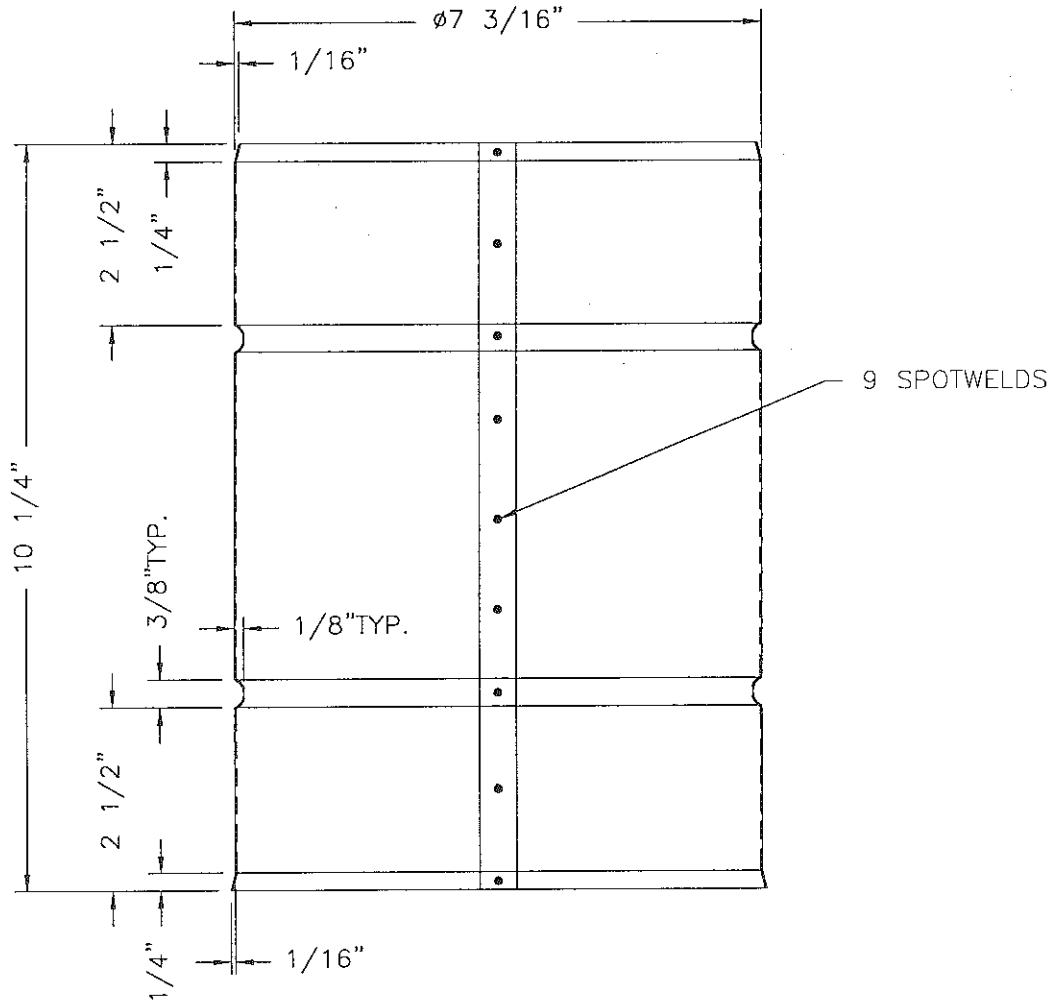


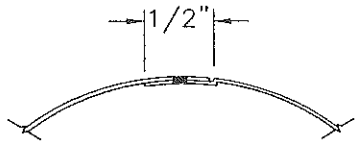


SIMPLE
OVERLAP

MATERIAL: SATIN COAT 0.018" cutting dim. 9 21/32" x 2 5/16"

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD		
DATE: JUNE 27, 01	TOLERANCES GENERALES: FRACT. ± 1/32" | X.XXX ± 0.005"	
ECH./SCALE: 1" = 1"	X.XX ± 0.015" | ANGLE ± 2°	
VERIFIÉ/CHECKED:	NOM/NAME: AIR TUBE	
CODE: SR2215		
PAGE: 1 of 1	REVISION	DESSIN/DWG: PROTO 2215

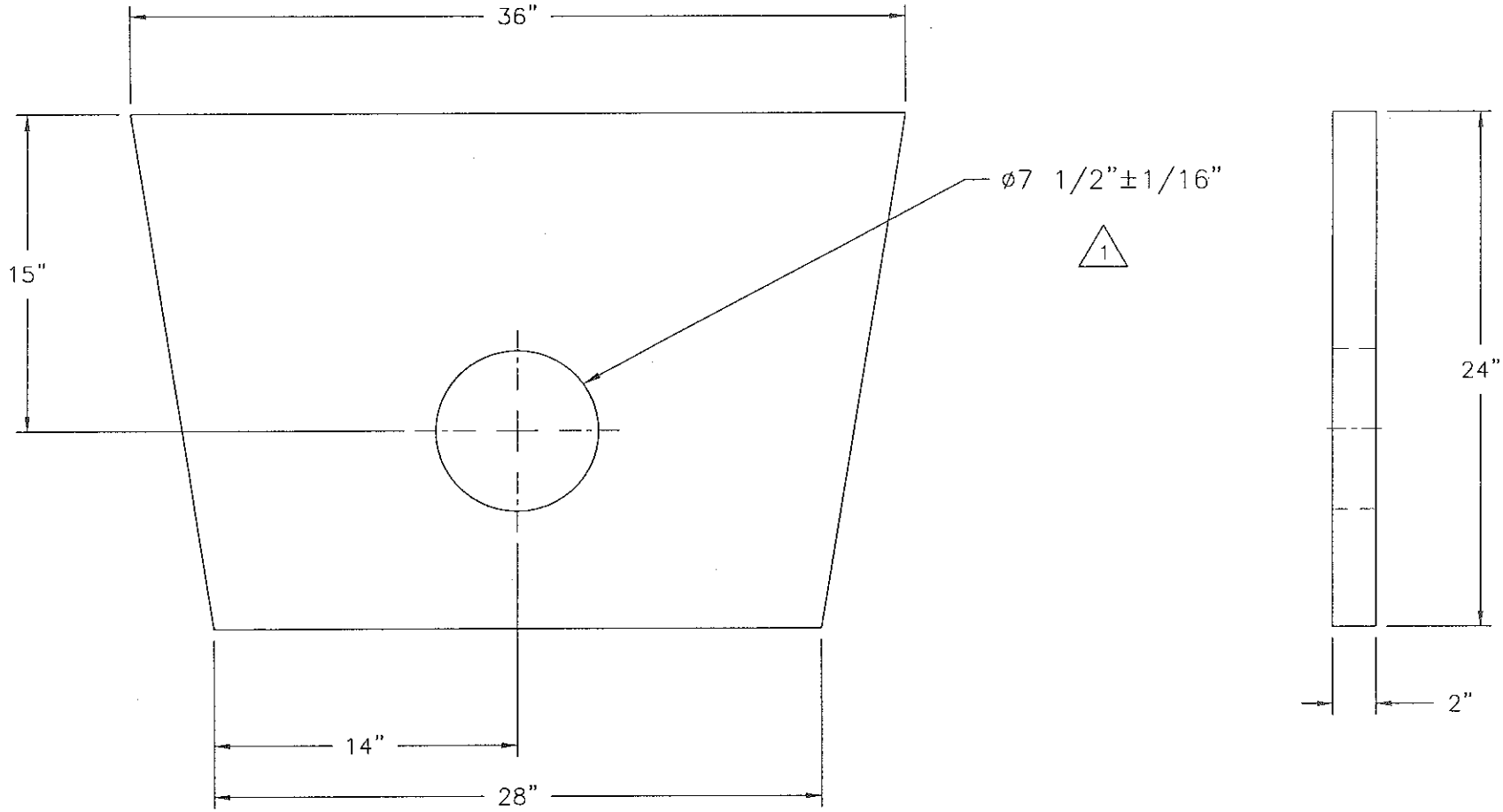




SIMPLE
OVERLAP

MATERIAL: ALUMINIZED 0.025" CUTTING DIM. 10 1/4" x 22 31/32"

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD		
DATE: JUNE 27, 01	TOLERANCES GENERALES: FRACT. ± 1/32" X.XXX ± N/A; X.XX ± 0.015" ANGLE ± 2°	
ECH./SCALE: 3/8" = 1"		
VERIFIÉ/CHECKED:	NOM/NAME: FLUE	
CODE: SR2216		
PAGE: 1 of 1	REVISION:	DESSIN/DWG: PROTO 2216



#1	ADD HOLE	07-19-01	E.L.
REV.	DESCRIPTION		DE:

CONCU/DESIGNED: E. LAM Y
DESSINE/DRAWN: C. GRIMARD
DATE: JUNE 1, 01
ECH./SCALE: 1/8" = 1"
VERIFIE/CHECKED:
CODE: ISO2217
PAGE: 1 of 1

SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE

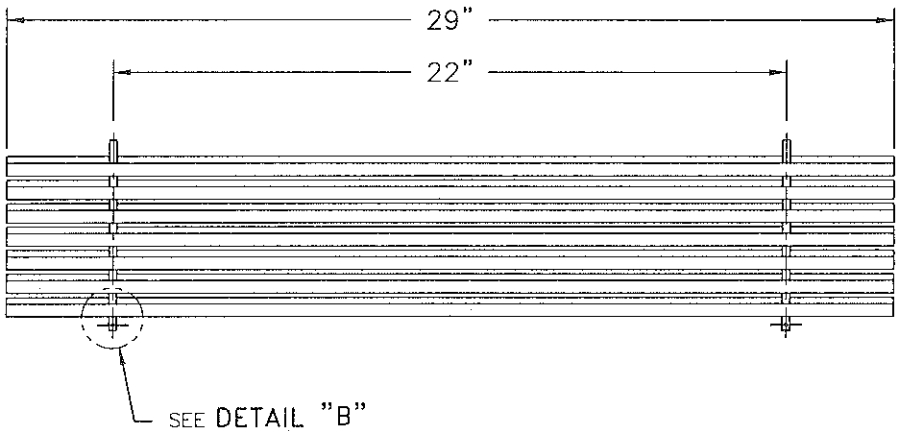
TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± N/A
X.XX ± N/A | ANGLE ± 2°

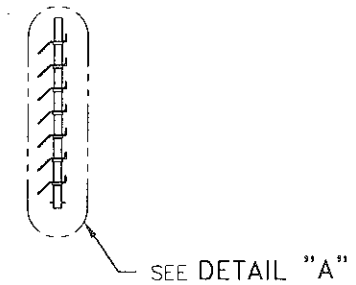
NOM/NAME: TOP INSULATION

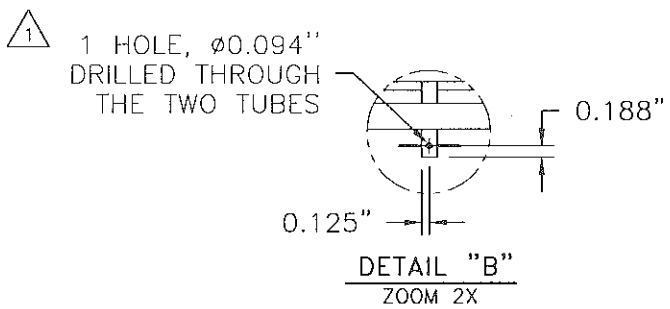
REVISION: 1
DESSIN/DWG: PROTO 2217

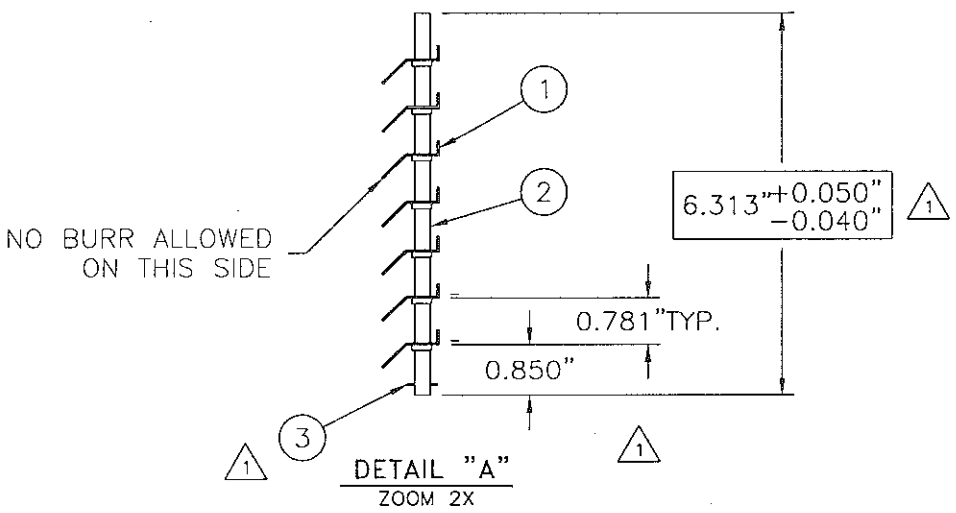
MATERIAL: ROCKBOARD 1230

No.	Qty	# Drawing	Desc
1	7	2224/SR2224	LOUVER
2	2	1830/SR1830B	LOUVER TUBE
3	2	U2	PIN



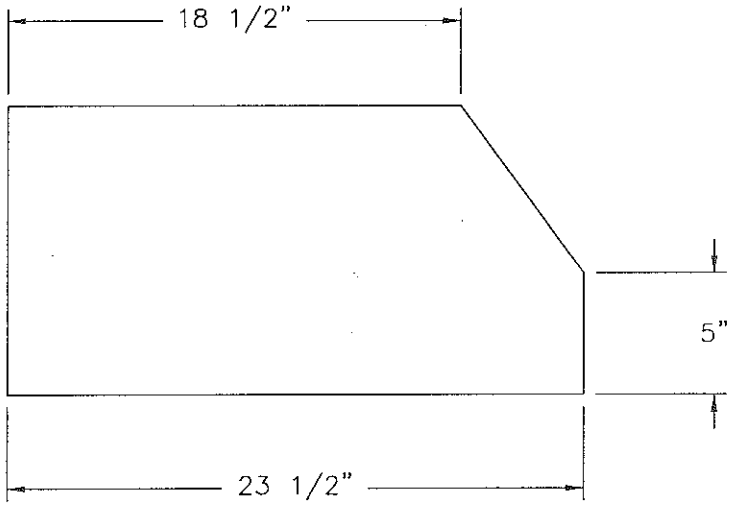


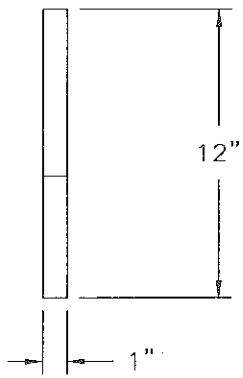




#1	ADD PIN & CHG. LOUVER POSITION	OCT. 24, 01	C.G
REV.	DESCRIPTION		DE:

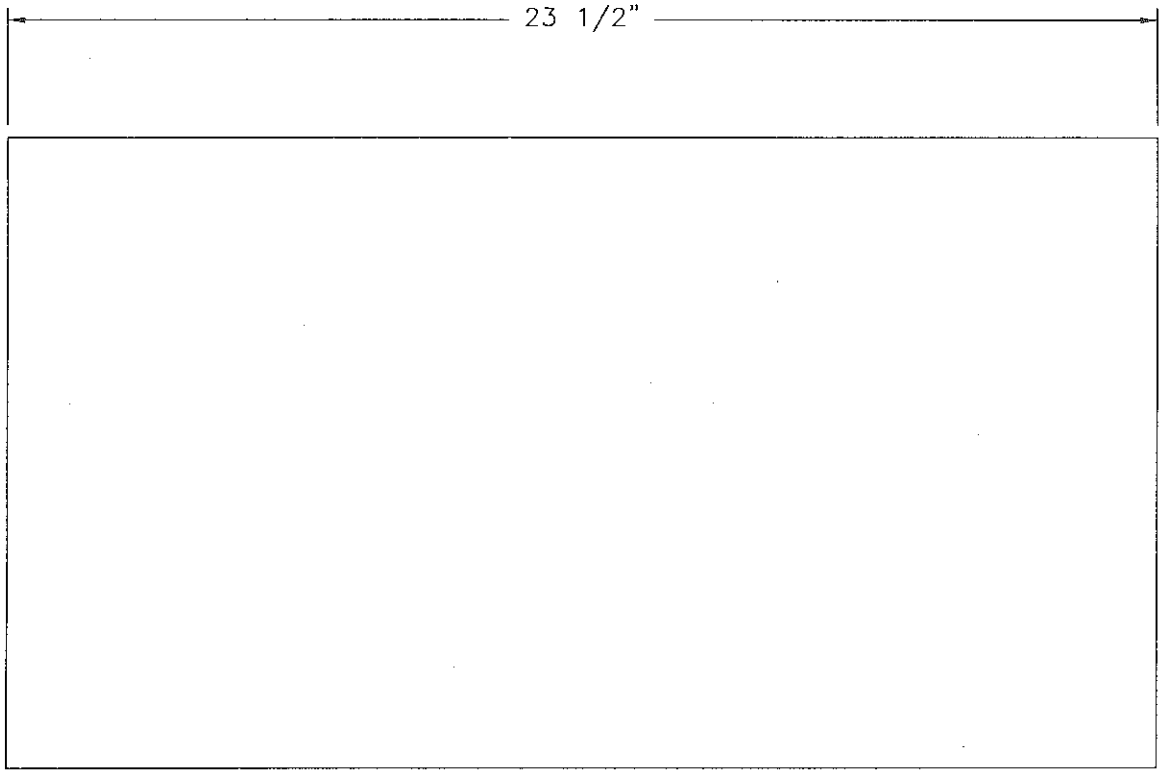
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINÉ/DRAWN: C. GRIMARD	
DATE: JUNE 21, 01	TOLERANCES GENERALES: FRACT. ± 1/32" X.XXX ± N/A; X.XX ± N/A ANGLE ± 2°
ECH./SCALE: 5/32" = 1"	
VERIFIÉ/CHECKED:	NOM/NAME: LOUVER ASSEMBLY
CODE: SR2218	
PAGE: 1 of 1	REVISION: #1 — DESSIN/DWG: PROTO 2218

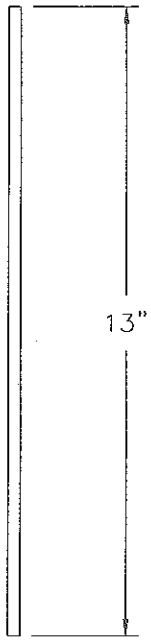


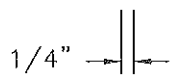


MATERIAL: ROCKBOARD 1230

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: JUNE 21, 01	TOLERANCES GENERALES: FRACT. ± 1/32" X.XXX ± N/A	
ECH./SCALE: 1/8" = 1"	X.XX ± N/A ANGLE ± 2°	
VERIFIE/CHECKED:	NOM/NAME: SIDE INSULATION	
CODE: ISO2219		
PAGE: 1 of 1	REVISION	DESSIN/DWG: PROTO 2219



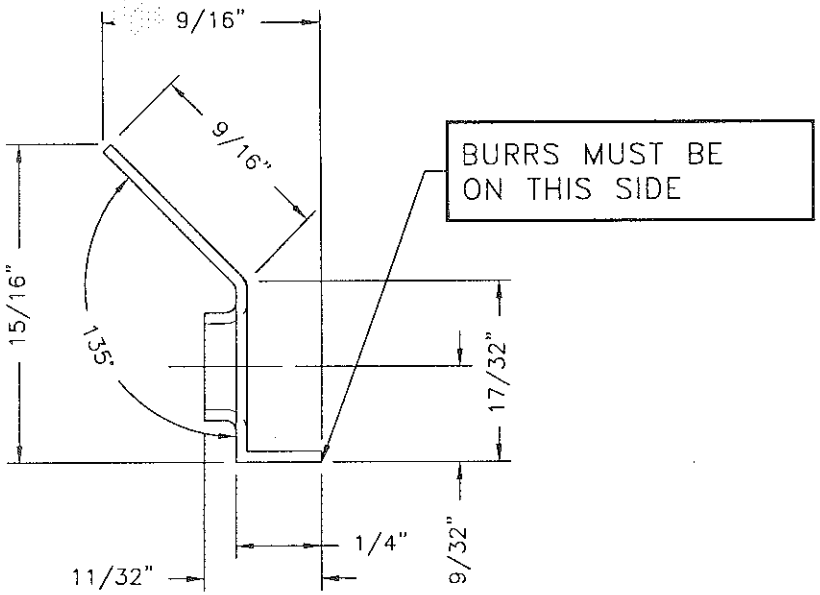




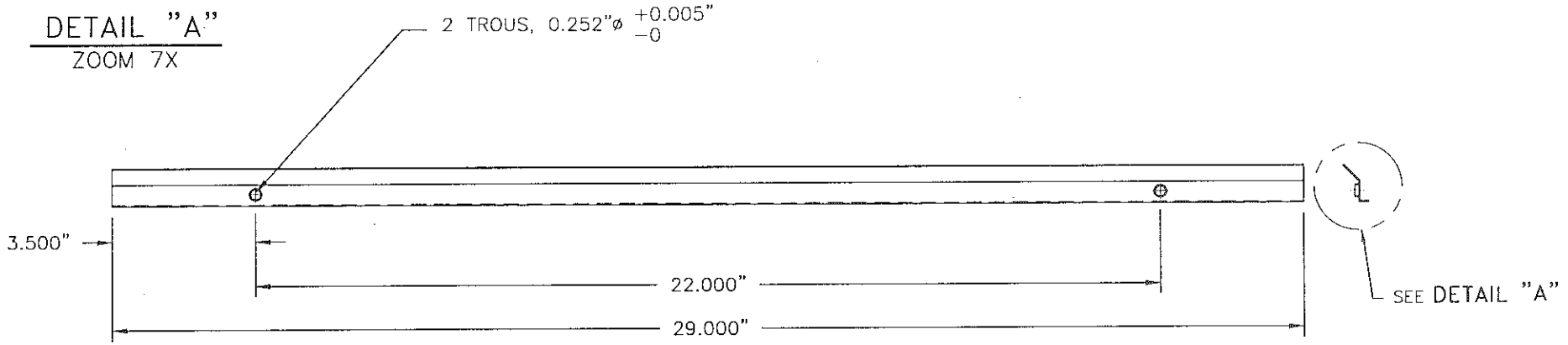
REV.	DESCRIPTION	DE:

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINÉ/DRAWN: C. GRIMARD	
DATE: JUNE 22, 01	TOLERANCES GENERALES
ECH./SCALE: 1/4" = 1"	FRACT. ± 1/32" | X.XXX ± N/A
	X.XX ± N/A | ANGLE ± 2°
VERIFIÉ/CHECKED:	NOM/NAME: INSULATION FOR GAS DEFLECTOR
CODE: ISO2220	
PAGE: 1 of 1	REVISION: / DESSIN/DWG: PROTO 2220

MATERIAL: CERAMIC FIBER 1/4"(ALBION 550K)

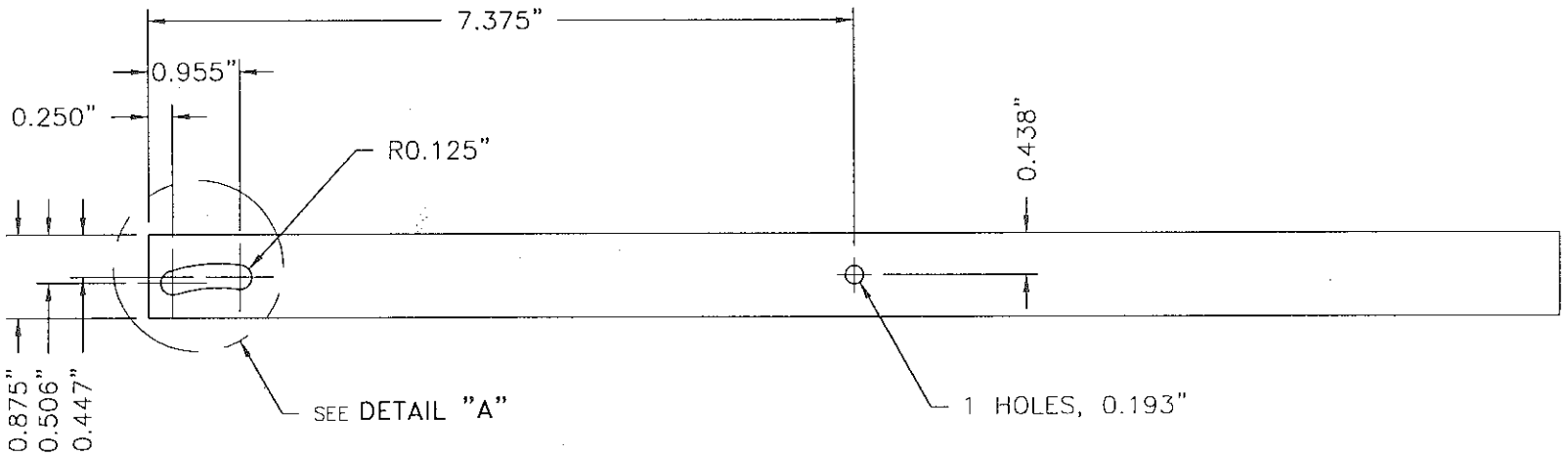


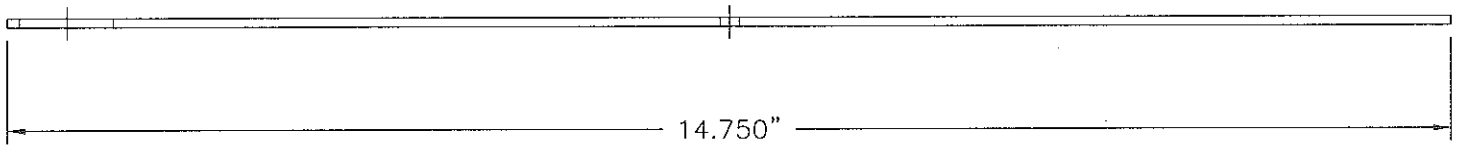
DETAIL "A"
ZOOM 7X

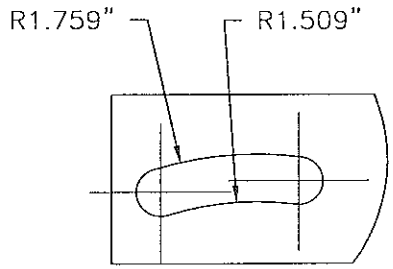


MATERIAL: SATIN COAT 0.025" 1.264" x 29"

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: JUNE 22, 01	TOLERANCES GENERALES: FRACT. ± 1/32" X.XXX ± 0.005" X.XX ± 0.015" ANGLE ± 2°	
ECH./SCALE: 1/4" = 1"		
VERIFIE/CHECKED:	NOM/NAME: LOUVER	
CODE: SR2224		
PAGE: 1 of 1	REVISION:	DESSIN/DWG: 2224



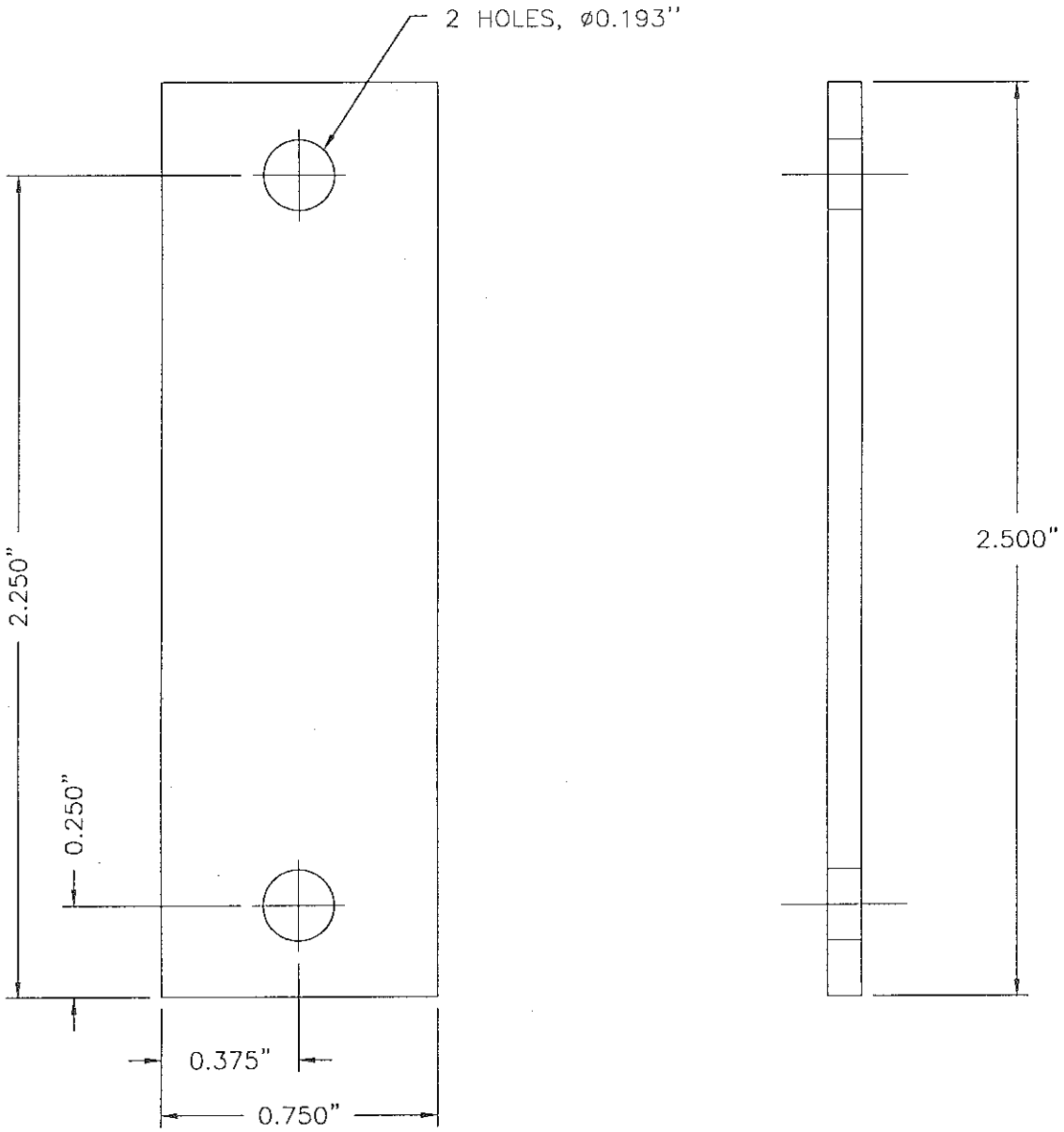




DETAIL "A"
ZOOM 2X

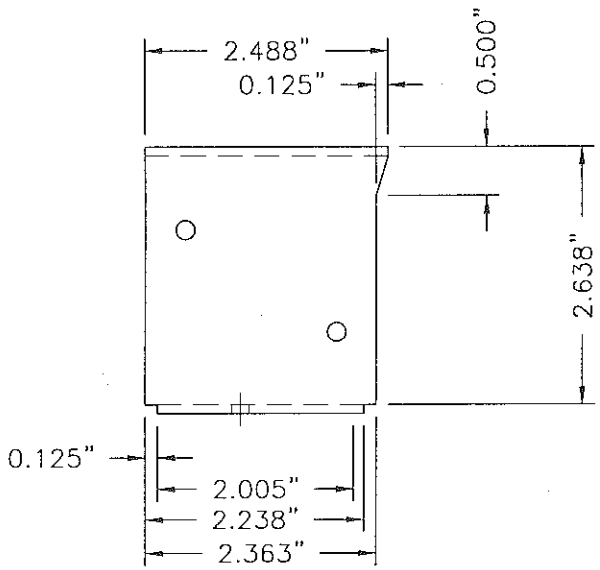
MATERIAL: HOT ROLLED STEEL 0.093"

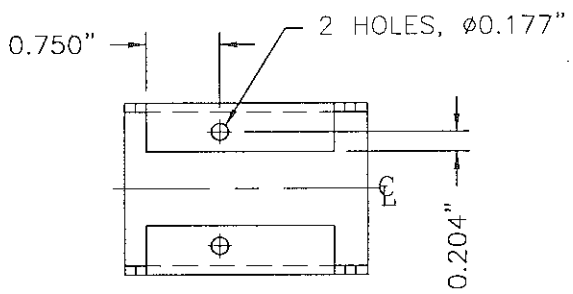
REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD		
DATE: OCT. 5, 01	TOLERANCES GENERALES: FRACT. ± 1/32" X.XXX ± 0.015"	
ECH./SCALE: 1/2" = 1"	X.XX ± N/A ANGLE ± 2°	
VERIFIÉ/CHECKED	NOM/NAME: AIR BOOST OBSTRUCTION PLATE	
CODE: SR2236		
PAGE: 1 of 1	REVISION	DESSIN/DWG: PROTO 2236

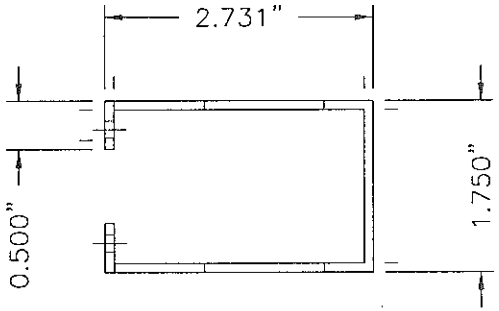


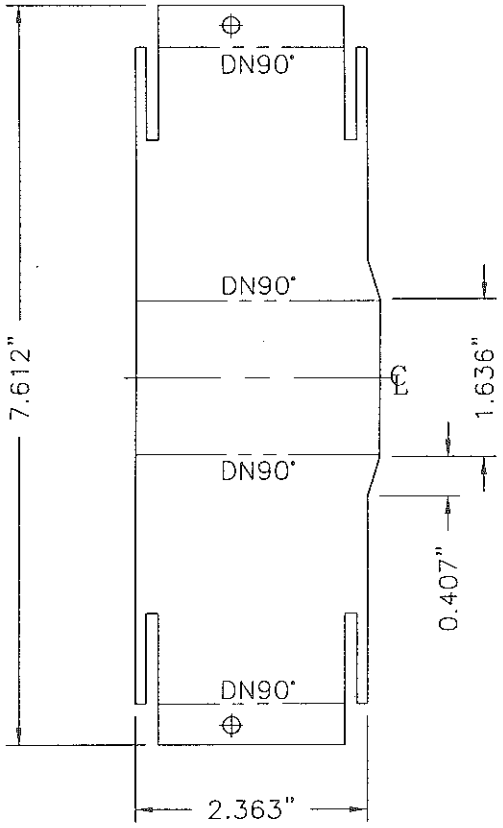
REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: OCT. 18, 01	TOLERANCES GENERALES: FRACT. ± 1/32" | X.XXX ± 0.015"	
ECH./SCALE: 2" = 1"	X.XX ± N/A | ANGLE ± 2°	
VERIFIE/CHECKED:	NOM/NAME: OBSTRUCTION SUPPORT PLATE	
CODE: SR2237		
PAGE: 1 of 1	REVISION:	DESSIN/DWG: PROTO 2237

MATERIAL: HOT ROLLED STEEL 0.093"









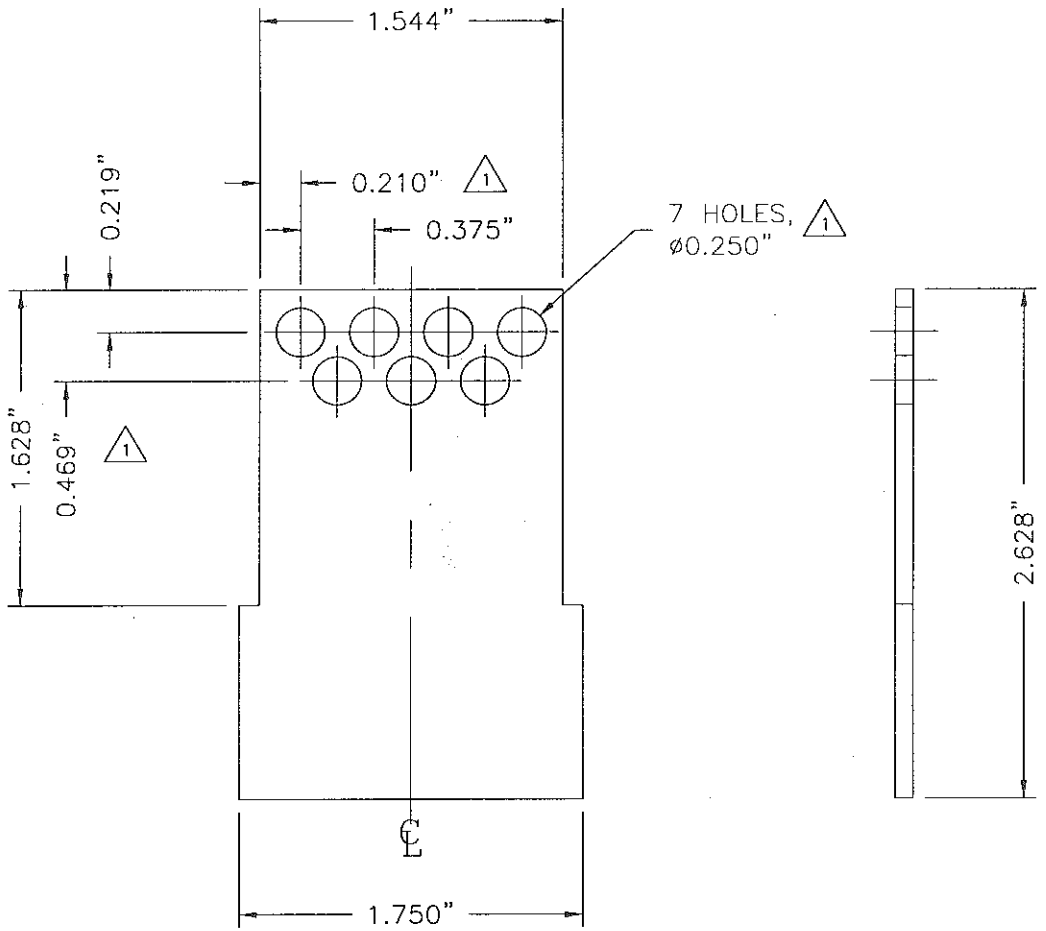
BEND:

NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- ALL BEND AT 90° UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: HOT ROLLED STEEL 0.093"

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: OCT. 5, 01	TOLERANCES GENERALES: FRACT. ± 1/32" X.XXX ± 0.015"	
ECH./SCALE: 5/8" = 1"	X.XX ± N/A ANGLE ± 2°	
VERIFIE/CHECKED:	NOM/NAME: AIR BOOST BOX CONTOUR	
CODE: SR2238		
PAGE: 1 of 2	REVISION	DESSIN/DWG: PROTO 2238



NOTE:
- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.

MATERIAL: HOT ROLLED STEEL 0.093"

REV.	DESCRIPTION	DE:
#1	CHG. HOLES POSITION & ø	OCT. 17, 01 C.G

CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: OCT. 5, 01
ECH./SCALE: 1" = 1"
VERIFIE/CHECKED:
CODE: SR2239
PAGE: 1 of 1

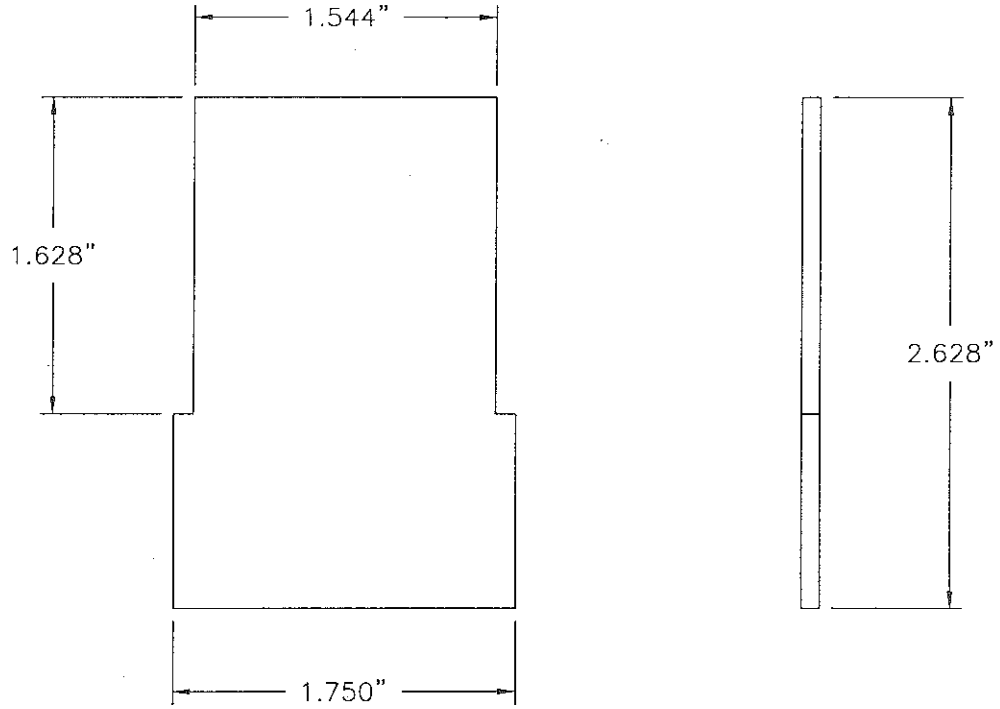
SECURITY CHIMNEYS INTERNATIONAL LTD — CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.015"
X.XX ± N/A | ANGLE ± 2°

NOM/NAME: AIR BOOST BOX FRONT

REVISION #1

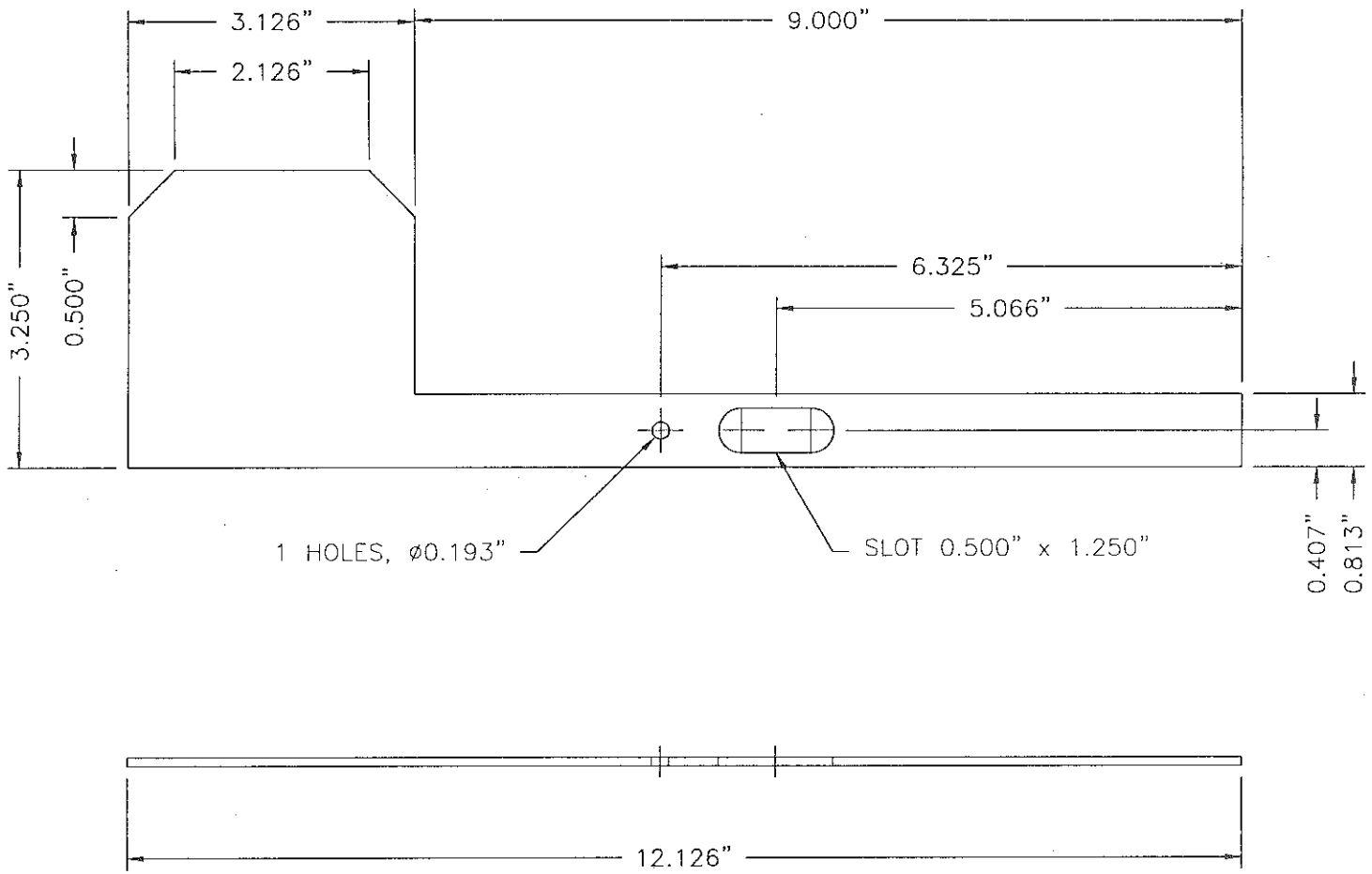
DESSIN/DWG: PROTO 2239



REV.	DESCRIPTION	DE:

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINÉ/DRAWN: C. GRIMARD	
DATE: OCT. 5, 01	TOLERANCES GENERALES: FRACT. ± 1/32" | X.XXX ± 0.015"
ECH./SCALE: 1" = 1"	X.XX ± N/A | ANGLE ± 2°
VERIFIÉ/CHECKED:	NOM/NAME: AIR BOOST BOX BACK
CODE: SR2240	
PAGE: 1 of 1	REVISION: | DESSIN/DWG: PROTO 2240

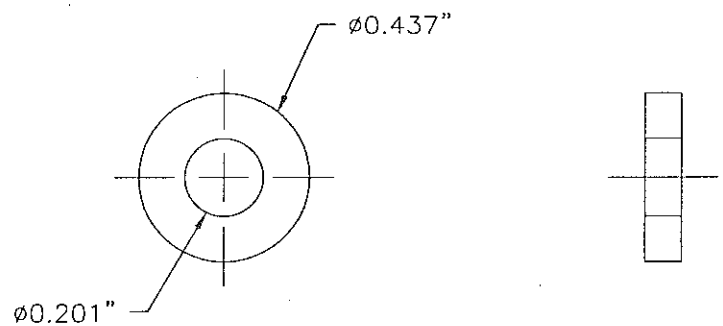
MATERIAL: HOT ROLLED STEEL 0.093"



REV.	DESCRIPTION	DE:

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINÉ/DRAWN: C. GRIMARD	TOLERANCES GENERALES
DATE: OCT. 5, 01	FRACT. ± 1/32" | X.XXX ± 0.015"
ECH./SCALE: 1/2" = 1"	X.XX ± N/A | ANGLE ± 2°
VERIFIÉ/CHECKED:	NOM/NAME: AIR BOOST REGISTER
CODE: SR2241	
PAGE: 1 of 1	REVISION / DESSIN/DWG: PROTO 2241

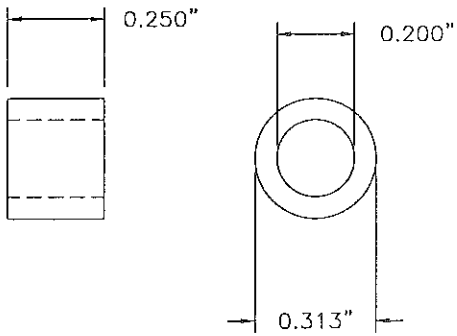
MATERIAL: HOT ROLLED STEEL 0.093"



MATERIAL: HOT ROLLED STEEL 0.093"

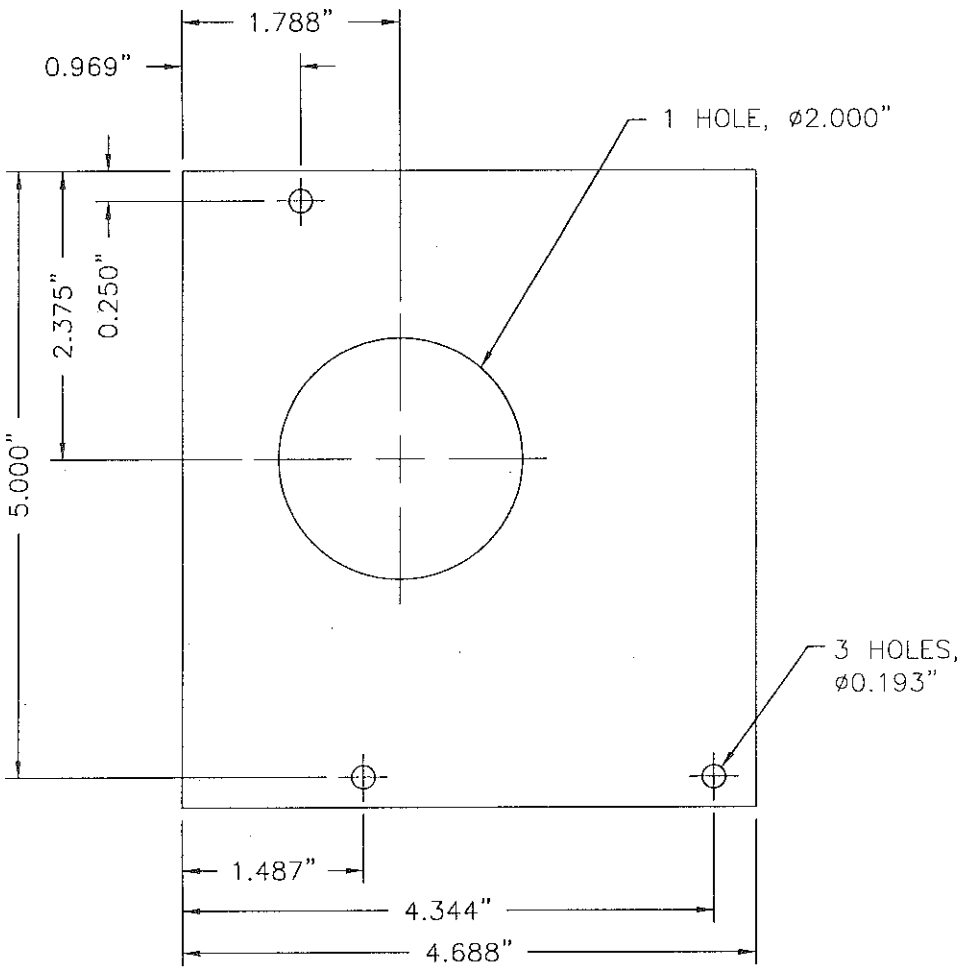
REV.	DESCRIPTION	DE:

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINEES SÉCURITÉ INTERNATIONAL LTÉE
DESSINE/DRAWN: C. GRIMARD	TOLERANCES GENERALES
DATE: OCT. 5, 01	FRACT. ± 1/32" X.XXX ± 0.015"
ECH./SCALE: 2" = 1"	X.XX ± N/A ANGLE ± 2°
VERIFIE/CHECKED:	NOM/NAME: SPACER 0.093"
CODE: SR2242	
PAGE: 1 of 1	REVISION: DESSIN/DWG: PROTO 2242



REV.	DESCRIPTION	DATE	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE		
DESSINÉ/DRAWN: E. LAMY			
DATE: NOV. 30, 2001	NOM/NAME: SPACER		
ECH./SCALE: 2" = 1"			
TOLERANCES: FRACT. ± 1/32" .XX ± 0.015" .XXX ± 0.005" ANGLE ± 0.5°	CODE: SR2243	REVISION:	
VERIFIÉ/CHECKED:	PAGE: 1 of 1	DESSIN/DWG: 2243	

MATERIAL: ALUMINUM (NO. 608-078 SPAE-NAUR)





MATERIAL: SATIN COAT 0.050"

#1	UP DATE DIMENSIONS	NOV. 12, 01	C.G
REV.	DESCRIPTION		DE:

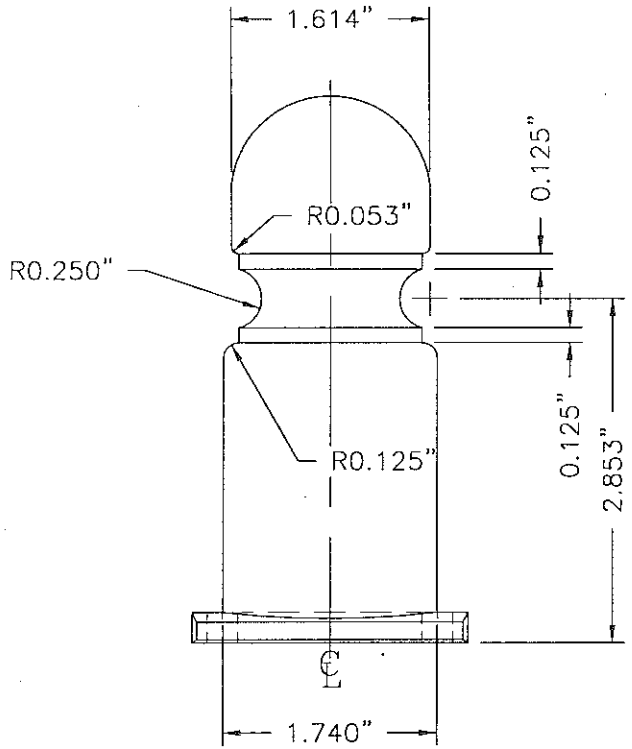
CONCU/DESIGNED: E. LAMY
DESSINE/DRAWN: C. GRIMARD
DATE: OCT. 5, 01
ECH./SCALE: 5/8" = 1"
VERIFIE/CHECKED:
CODE: SR2244
PAGE: 1 of 1

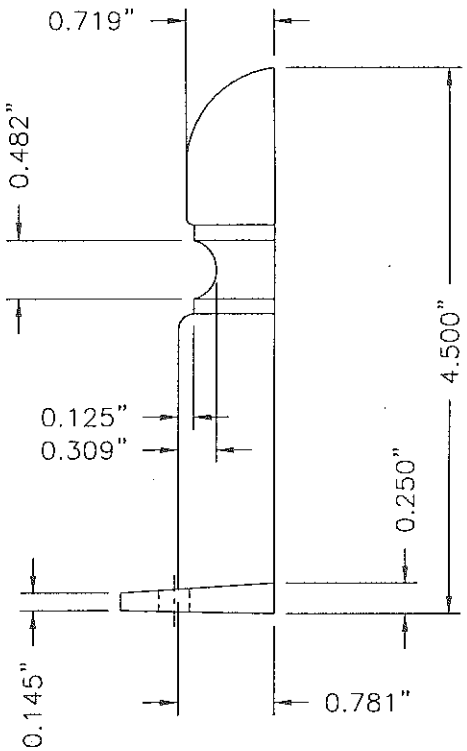
SECURITY CHIMNEYS INTERNATIONAL LTD
CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

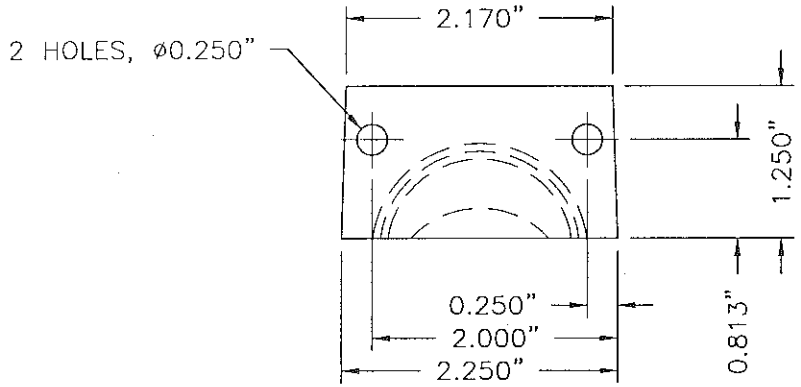
TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.015"
X.XX ± N/A | ANGLE ± 2°

NOM/NAME: PRIMARY AIR CONTROL PLATE

REVISION: #1
DESSIN/DWG: PROTO 2244



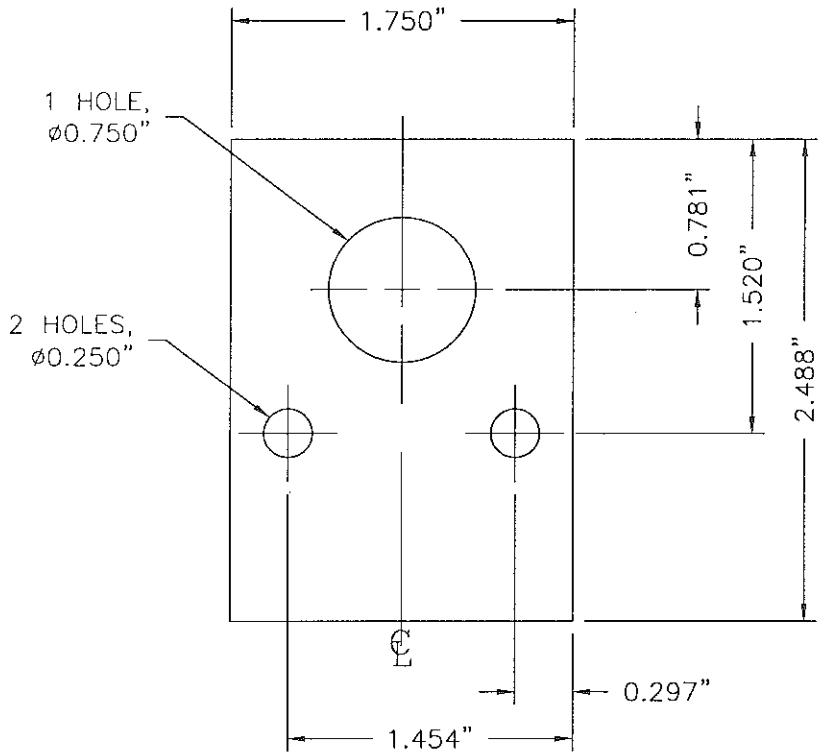




REV.	DESCRIPTION	DE:

CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD		
DATE: OCT. 17, 01	TOLERANCES GENERALES	
ECH./SCALE: " = 1"	FRACT. ± 1/8" / X.XX ± N/A	X.XXX ± N/A / ANGLE ± 2°
VERIFIÉ/CHECKED:	NOM/NAME: ANDIRON	
CODE: SR2245		
PAGE: 1 of 1	REVISION	DESSIN/DWG: PROTO 2245

MATERIAL: GREY CASTING A 48 CLASS 30



NOTE:
- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.

MATERIAL: CERAMIC FIBER 1/8" THICK.

REV.	DESCRIPTION	DE:

CONCU/DESIGNED: E. LAMY
DESSINÉ/DRAWN: C. GRIMARD
DATE: OCT. 18, 01
ECH./SCALE: 1" = 1"
VERIFIÉ/CHECKED:
CODE: SR2253
PAGE: 1 of 1

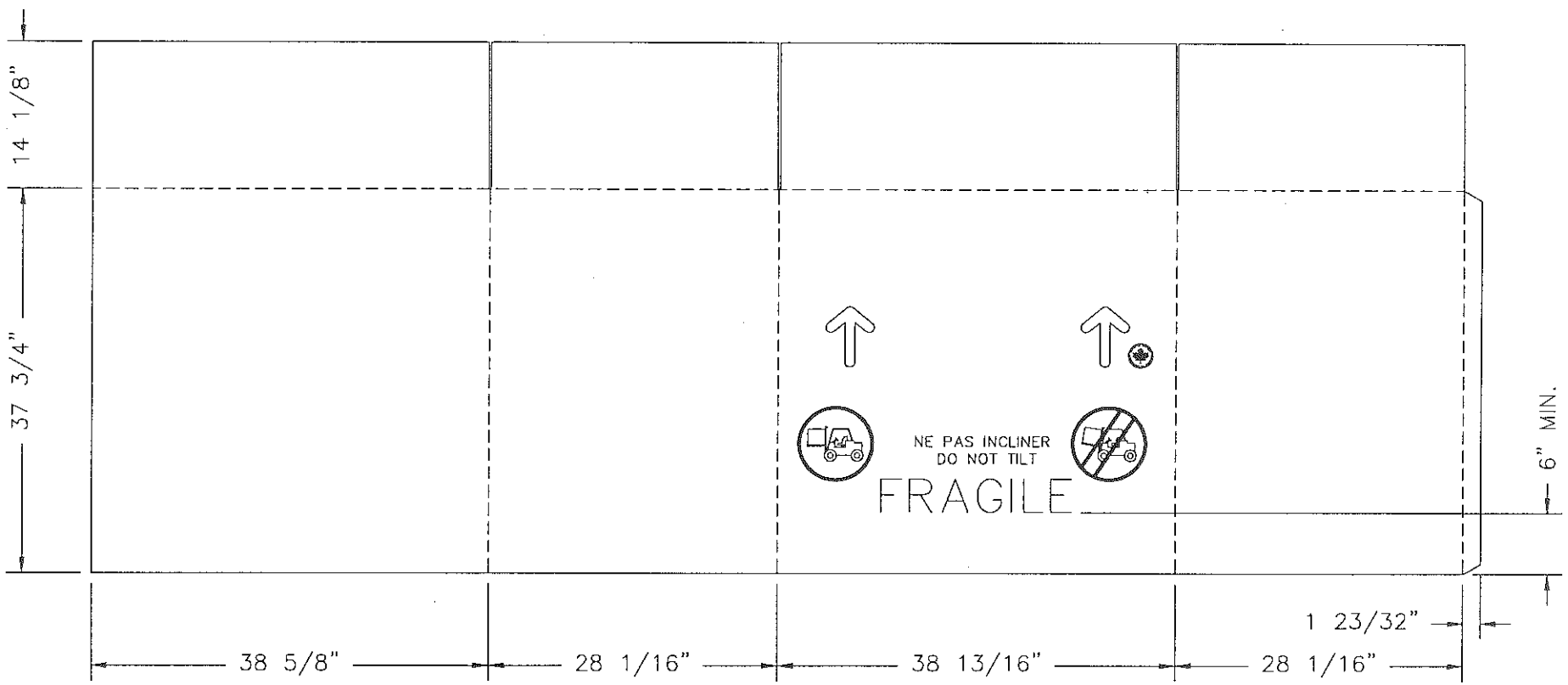
SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE

TOLERANCES GENERALES
FRACT. ± 1/32" | X.XXX ± 0.015"
X.XX ± N/A | ANGLE ± 2°

NOM/NAME: AIR BOOST BOX GASKET

REVISION:

DESSIN/DWG: PROTO 2253

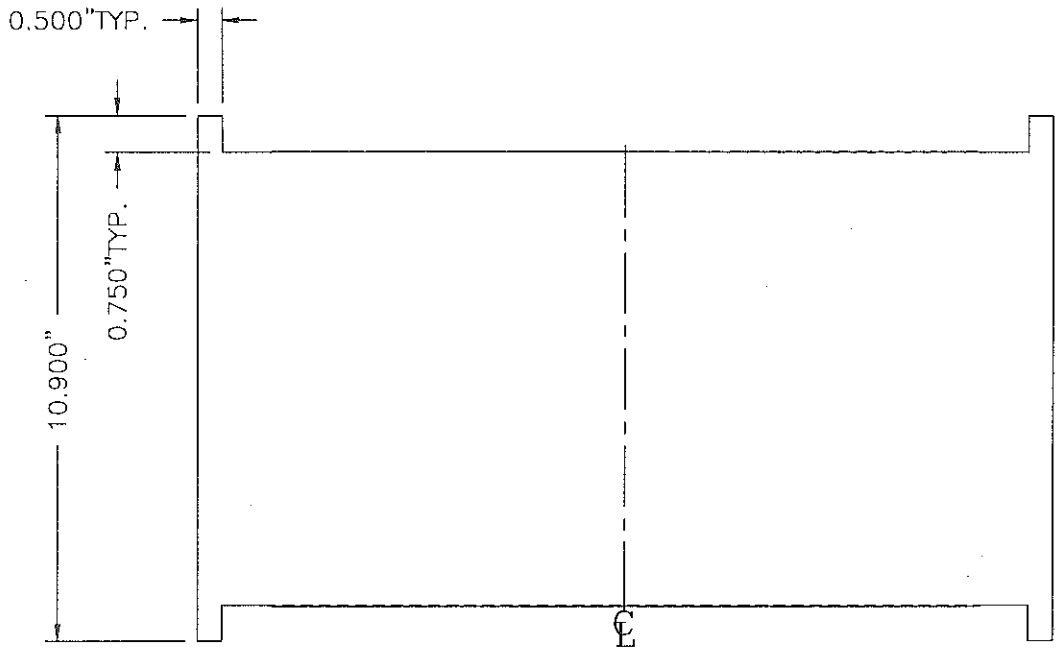


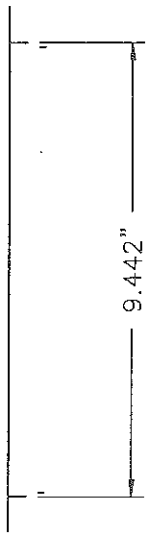
SENS DE
L'ONDULATION

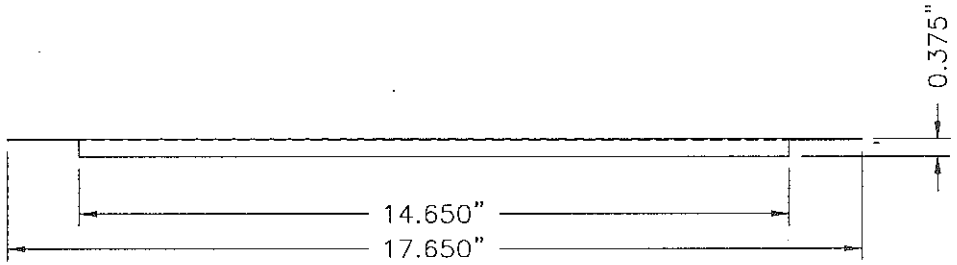
--ADDED CODE ON THE BOX.

MATERIAL: 275 CB

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. DUFOUR	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: OCT. 29, 01	TOLERANCES GENERALES: FRACT. ± 1/32" | X.XXX ± N/A; X.XX ± N/A | ANGLE ± 2°	
ECH./SCALE: 1/16" = 1"		
VERIFIE/CHECKED:	NOM/NAME: COUNTOUR BOX	
CODE: BT2254		
PAGE: 1 of 1	REVISION	DESSIN/DWG: PROTO 2254





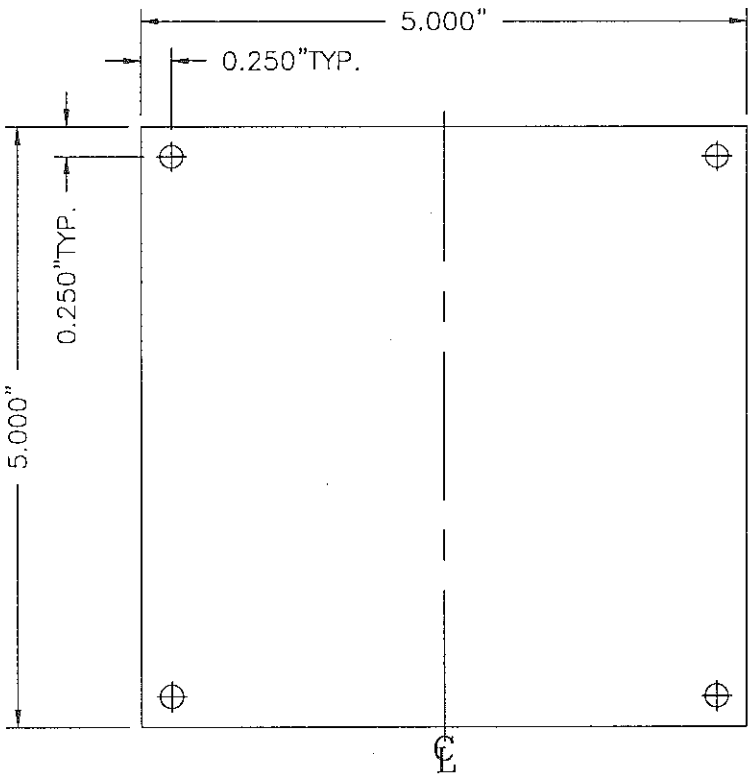


NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- ALL BEND AT 90° UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: 'GALVANIZED STEEL 0.021

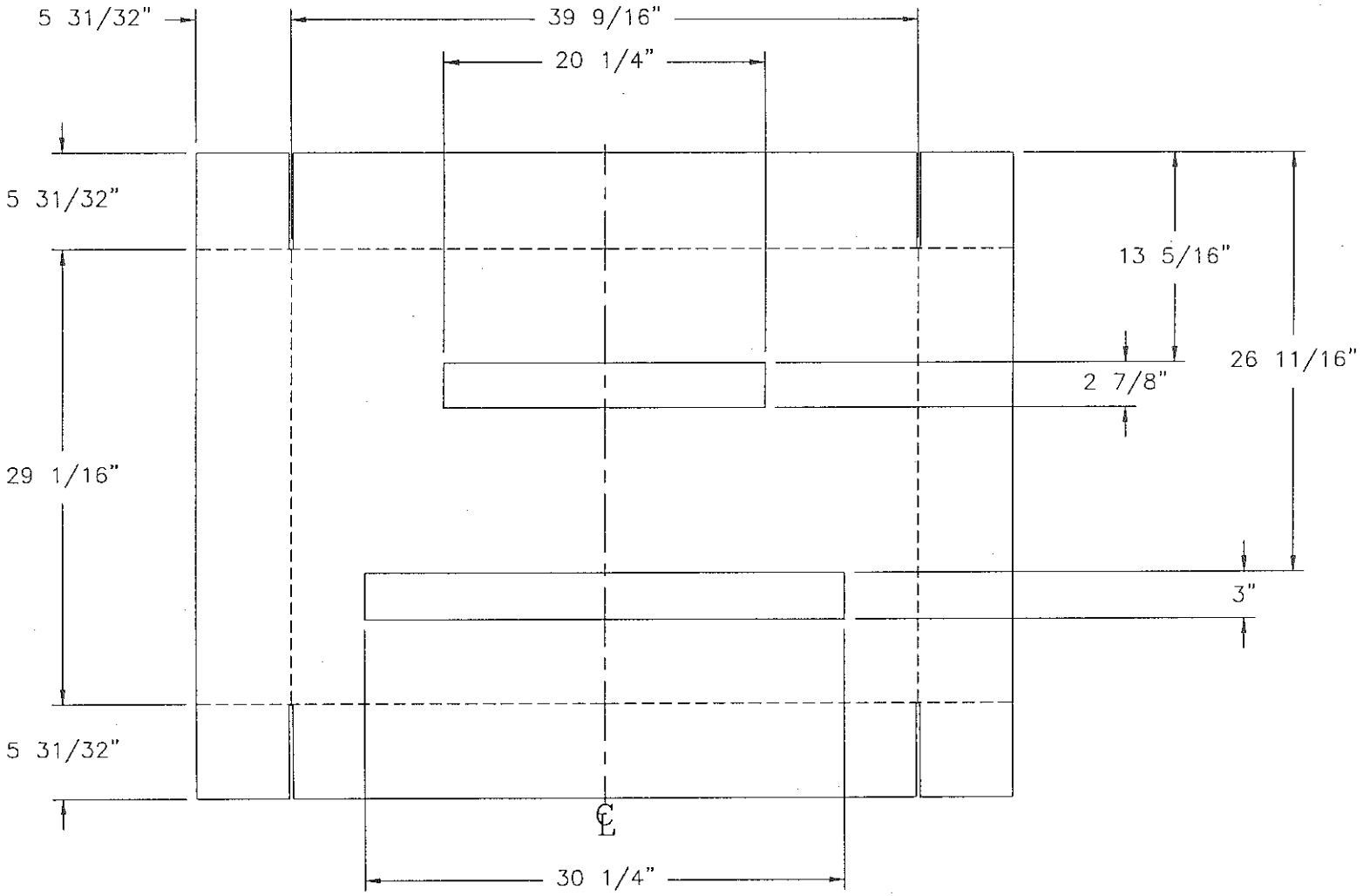
REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD	TOLERANCES GENERALES	
DATE: NOV. 12, 01	FRACT. ± 1/32" X.XXX ± 0.015"	
ECH./SCALE: 1/4" = 1"	X.XX ± N/A ANGLE ± 2°	
VERIFIÉ/CHECKED:	NOM/NAME: HEAT DEFLECTOR BIS VISTA	
CODE: SR2255		
PAGE: 1 of 2	REVISION	DESSIN/DWG: PROTO 2255



NOTE:
–PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.

MATERIAL: GALVANIZED STEEL 0.021"

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: OCT. 12, 01	TOLERANCES GENERALES	
ECH./SCALE: 5/8" = 1"	FRACT. ± 1/32" X.XXX ± 0.015" X.XX ± N/A ANGLE ± 2°	
VERIFIE/CHECKED:	NOM/NAME: AIR OBSTRUCTION PLATE	
CODE: SR2256		
PAGE: 1 of 1	REVISION	DESSIN/DWG: PROTO 2256

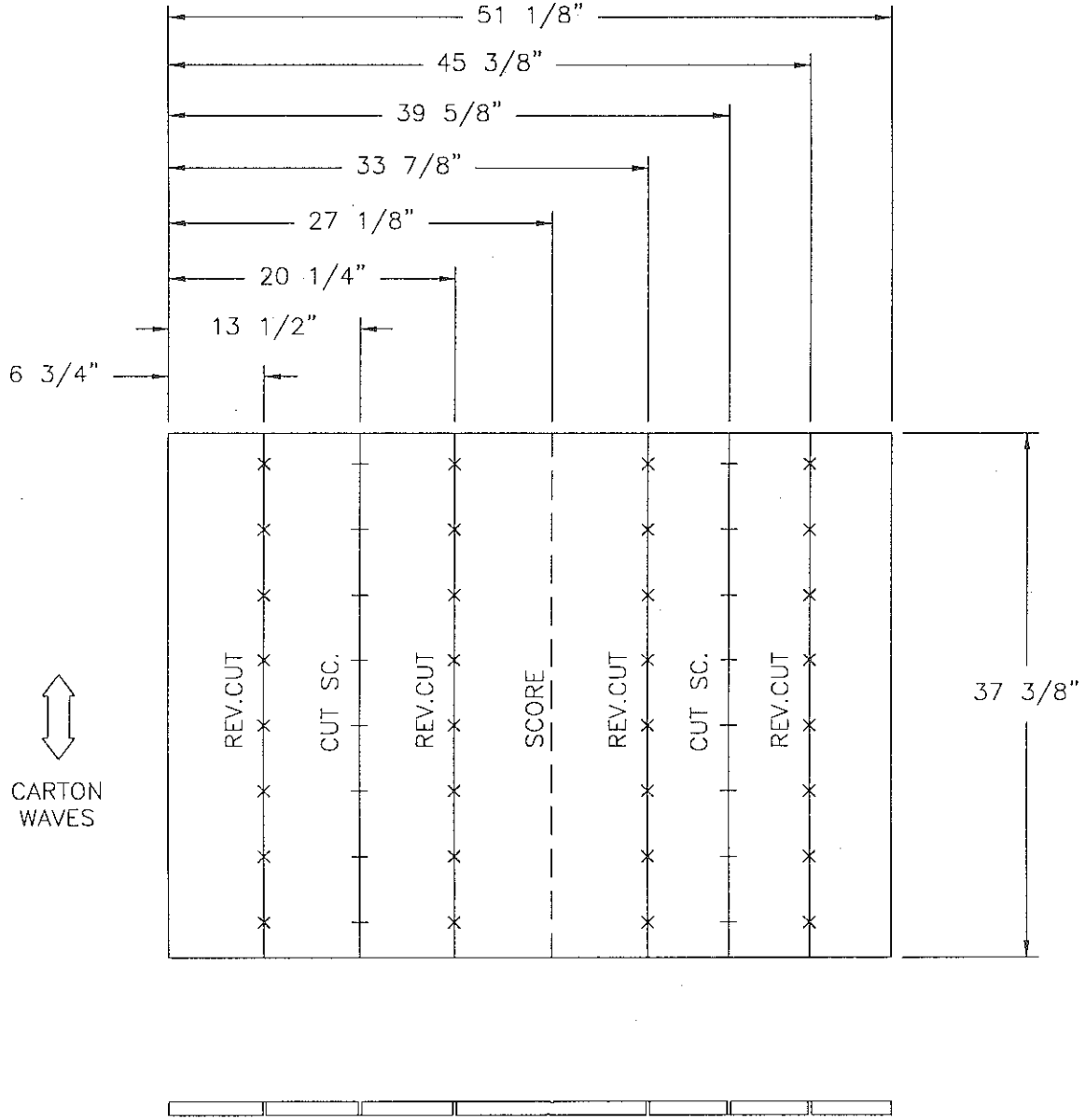


CARTON
WAVES

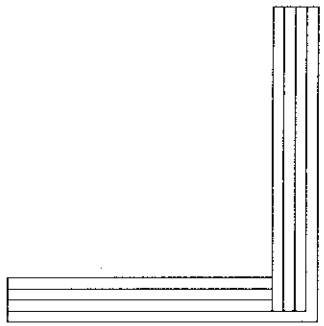
NOTE:
- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- PRINT THE CODE FOT THE BOX ON THE FLAP.

MATERIAL: CARDBOARD 200 CB

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. DUFOUR	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: OCT. 26, 01	TOLERANCES GENERALES	
ECH./SCALE: 3/32" = 1"	FRACT. ± 1/32" X.XXX ± N/A; X.XX ± N/A ANGLE ± 2°	
VERIFIE/CHECKED:	NOM/NAME: BOTTOM BOX	
CODE: BT2257		
PAGE: 1 of 1	REVISION	DESSIN/DWG: PROTO 2257



CARTON
WAVES



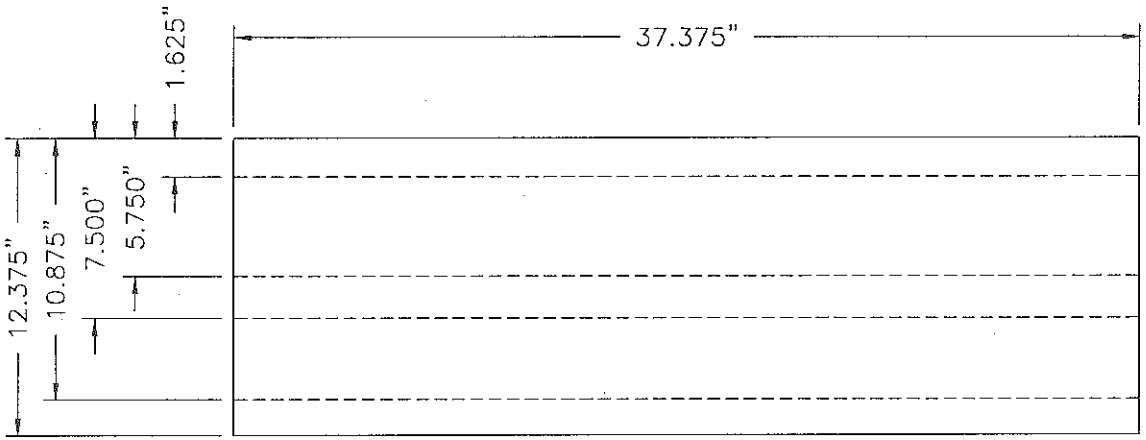
CARTON PLIE
ZOOM3X

NOTE:

MATERIAL: CARDBOARD 275 CB

REV.	DESCRIPTION	DE:

CONCU/DESIGNED: E. DUFOUR	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE
DESSINÉ/DRAWN: C. GRIMARD	TOLERANCES GENERALES
DATE: OCT. 30, 01	FRACT. ± 1/32" X.XXX ± N/A
ECH./SCALE: 5/64" = 1"	X.XX ± N/A ANGLE ± 2°
VERIFIÉ/CHECKED:	NOM/NAME: BOX CORNER
CODE: BT2261	
PAGE: 1 of 1	REVISION / DESSIN/DWG: PROTO 2261



CARTON
WAVES

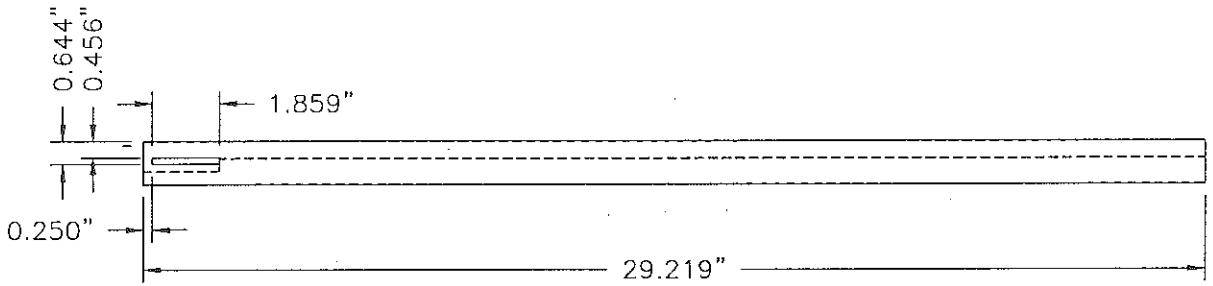


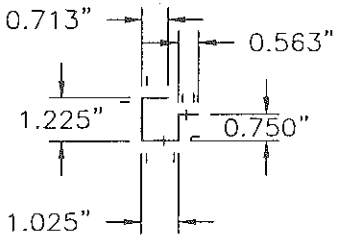
CARTON PLIE
ZOOM 3X

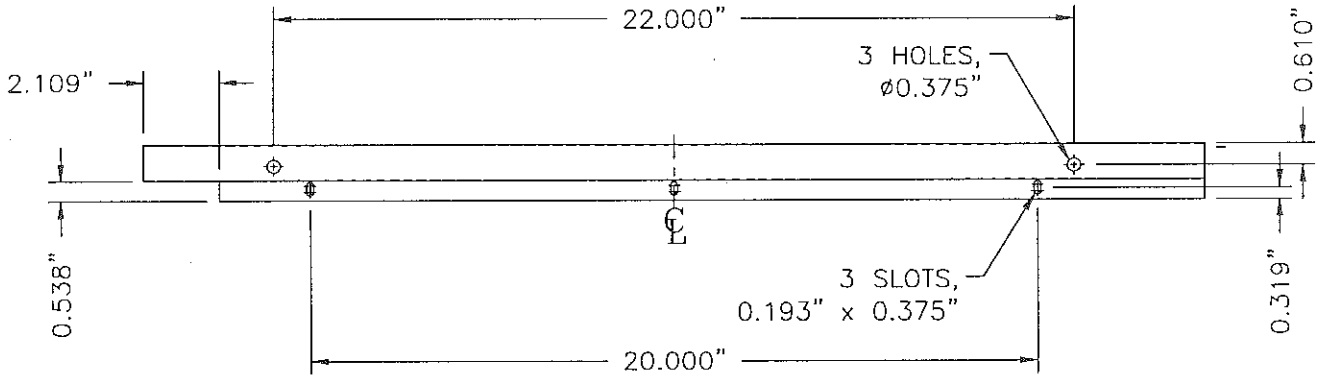
NOTE:

MATERIAL: CARTON 275 C

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. DUFOUR	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: OCT. 30, 01	TOLERANCES GENERALES	
ECH./SCALE: 1/8" = 1"	FRACT. ± 1/32" X.XXX ± N/A	
VERIFIE/CHECKED:	X.XX ± N/A ANGLE ± N/A	
CODE: BT2262	NOM/NAME: TRANGLE CORNERS	
PAGE: 1 of 1	REVISION	DESSIN/DWG: PROTO 2262





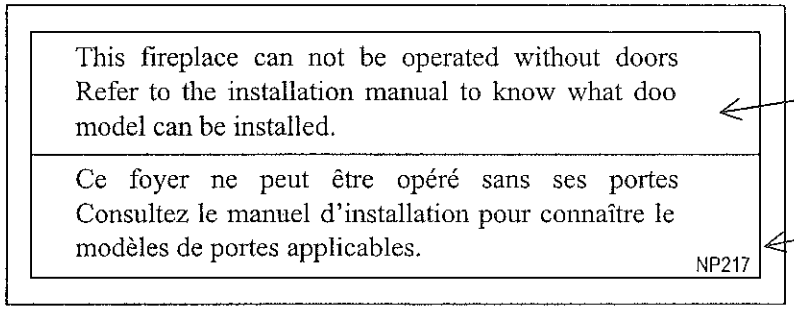


NOTE:

- PIECE IS SYMMETRICAL WRT CENTER LINE UNLESS OTHERWISE SPECIFIED.
- ALL BEND AT 90° UNLESS OTHERWISE SPECIFIED.
- THE DIMENSIONS IN THE BOX INDICATE MEASURMENTS TO BE INSPECTED.
- BENDING RADIUS EQUAL : 0.031"

MATERIAL: SATIN COAT 0.025"

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINE/DRAWN: C. GRIMARD		
DATE: NOV 9, 01	TOLERANCES GENERALES: FRACT. ± 1/32" | X.XXX ± 0.005"	
ECH./SCALE: 3/16" = 1"	X.XX ± N/A | ANGLE ± 2°	
VERIFIE/CHECKED:	NOM/NAME: BOTTOM FACADE CAPING	
CODE: SR2263		
PAGE: 1 of 2	REVISION:	DESSIN/DWG: PROTO 2263



MATÉRIEL: AUTOCOLLANT PERMANENT

STYLE: ÉTIQUETTE ROULEAU BUTT CUT

DIMENSIONS: H = 1 ½" L = 4" TOLÉRANCE: ± 1/8"

LETTRAGE: ROUGE SUR FOND BLANC

REV. DATE:	DESCRIPTION	
CONCU/DESIGNED ERIC DUFOUR	SECURITY CHIMNEYS INTERNATIONAL	
DESSINÉ/DRAWN J.A. POIRIER		
DATE: JUILLET 1998		
VÉRIFIÉ/CHECKED		
CODE NP217	NOM/NAME ÉTIQUETTE-WARNING - BIS ULTRA	
PAGE 1 DE 1	REVISION 0	DESSIN/DWG NP217

Warnock Hersey

C US

LISTED FACTORY BUILT FIREPLACE
FOYER PRÉFABRIQUÉ HOMOLOGUÉ

MODEL / MODÈLE: BIS VISTA

TESTED TO ULC S610 / UL 127
TESTÉ SELON (October / Octobre 2001)

CLEARANCES TO COMBUSTIBLES:	DÉGAGEMENTS AUX COMBUSTIBLES:
SIDE WALL: 24" (610 mm) (FROM DOOR EDGE)	MUR LATÉRAL : 24" (610 mm) (DE L'OUVERTURE DE LA PORTE)
MANTLE: 45" (1372 mm) (ABOVE THE BASE OF THE FIREPLACE)	LINTEAU : 45" (1372 mm) (AU-DESSUS DE LA BASE DU FOYER)
BACK WALL AND FIREPLACE SIDE: 0" (0 mm) (FROM SPACERS)	MUR ARRIÈRE ET CÔTÉ DU FOYER : 0" (0 mm) (DES ESPACEURS)
ABOVE THE FIREPLACE: 6'8" (2032 mm) (FROM THE BASE OF THE FIREPLACE)	AU-DESSUS DU FOYER : 6'8" (2032 mm) (À PARTIR DE LA BASE DU FOYER)
CHIMNEY: 2" (51 mm)	CHEMINÉE: 2" (51 mm)

SECURITY CHIMNEYS INTERNATIONAL LTD — CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE.

LAVAL, QUÉBEC, CANADA.

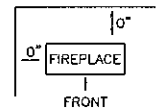
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- FUEL: WOOD ONLY
- NON COMBUSTIBLE HEARTH EXTENSION MUST BE INSTALLED AT FRONT OF UNIT EXTENDING 18 in. (457 mm) AT FRONT AND 36 in. (914 mm) WIDE MINIMUM .
- THIS FIREPLACE HAS NOT BEEN TESTED WITH UNVENTED GAS LOG SET. TO REDUCE RISK OF FIRE OR INJURY DO NOT INSTALL AN UNVENTED GAS LOG SET INTO THE FIREPLACE.
- ELECTRICAL RATING: 115 V, 60 Hz
- USE ONLY WITH 6 in. DIAMETER CHIMNEY, CERTIFIED MODEL ASHT+, S-2100+, HT6000+, HT6103+ OR AC.
- CAN BE CONNECTED TO A MASONRY CHIMNEY AS DESCRIBED IN THE INSTALLATION INSTRUCTIONS.
- COMPONENTS USED WITH THE FIREPLACE MUST BE LISTED. SEE LIST IN THE INSTALLATION INSTRUCTIONS.
- REPLACE GLASS WITH CERAMIC GLASS 5 mm THICK.
- FOR SAFE OPERATION INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS
- CAUTION: COMBUSTION AIR OPENING MUST NOT BE OBSTRUCTED
- DO NOT OVERFIRE THE FIREPLACE
- OPERATE THE FIREPLACE WITH DOOR FULLY OPEN OR FULLY CLOSED ONLY.

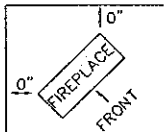
- COMBUSTIBLE: BOIS SEULEMENT
- UN TABLIER NON COMBUSTIBLE DOIT ÊTRE INSTALLÉ À L'AVANT DU FOYER . DIMENSION MINIMALE DE 18 po. (457 mm) PAR 36 po. (914 mm) DE LARGE.
- MAINTENIR LES MEUBLES ET AUTRES OBJETS À UNE DISTANCE SÉCURITAIRE DU FOYER
- ALIMENTATION ÉLECTRIQUE: 115V, 60 Hz
- UTILISER SEULEMENT AVEC UNE CHEMINÉE 6 po. (150 mm) DE DIAMÈTRE, MODÈLE ASHT+, S2100+, HT6000+, HT6103+ OU AC HOMOLOGUÉE.
- PEUT ÊTRE RACCORDÉ SUR UNE CHEMINÉE DE MAÇONNERIE TEL QUE DÉCRIT DANS LE MANUEL D'INSTALLATION.
- LES COMPOSANTES UTILISÉES AVEC LE FOYER DOIVENT ÊTRE HOMOLOGUÉES. VOIR LA LISTE DANS LE MANUEL D'INSTALLATION.
- REMPLACER LA VITRE AVEC UN VERRE CÉRAMIQUE DE 5mm D'ÉPAISSEUR.
- POUR UNE UTILISATION SÉCURITAIRE, INSTALLER CONFORMÉMENT AUX DIRECTIVES DU FABRICANT.
- ATTENTION : NE PAS OBSTRUER LES ARRIVÉES D'AIR COMBURANT.
- NE PAS FAIRE SURCHAUFFER LE FOYER.
- LA PORTE DU FOYER DOIT DEMEURER TOTALEMENT OUVERTE OU TOTALEMENT FERMÉE LORSQUE LE FOYER FONCTIONNE.

CONTACT YOUR LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTIONS IN YOUR AREA.

INSTALL WITH MINIMUM CLEARANCES TO WALL AS SHOWN IN INCHES



BACKWALL AND FIREPLACE SIDE



CORNER INSTALLATION

INSTALL AND USE ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND LOCAL BUILDING CODES.

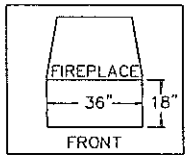
CHIMNEY TYPE: USE ONLY LISTED CHIMNEY MODEL ASHT+, S-2100+, HT6000+, HT6103+, AC, 6 in. DIAMETER.

SPECIAL METHODS ARE REQUIRED WHEN PASSING THROUGH A WALL OR CEILING. SEE INSTRUCTIONS AND BUILDING CODES.

PREVENT CREOSOTE FIRE: INSPECT CHIMNEY CONNECTOR AND CHIMNEY FLUE MONTHLY AND CLEAN IF NECESSARY. DO NOT OVERFIRE. IF DOME OR CHIMNEY CONNECTOR GLOWS YOU ARE OVERFIRING.

KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROM APPLIANCE.

FLOOR PROTECTOR MINIMUM DISTANCE FROM OPENING IN INCHES



HEARTH EXTENSION MATERIAL :
- 3/8 " THICKNESS NON COMBUSTIBLE MATERIAL
- OR EQUIVALENTS

NP247 Rev. 0

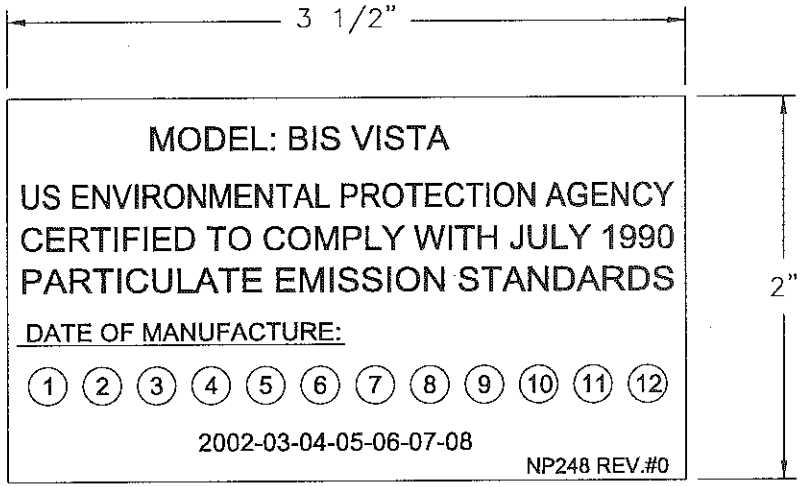
MATÉRIEL: AUTOCOLLANT PERMANENT ALUMINIUM, CLASSE III A

STYLE: ÉTIQUETTE ROULEAU BUTT CUT

DIMENSIONS: H = 3 11/32 " L = 6 3/8" TOLÉRANCE: ± 1/8"

LETTRAGE: NOIR SUR FOND ALUMINIUM

REV. DATE:	DESCRIPTION	
CONCU/DESIGNED ERIC LAMY	SECURITY CHIMNEYS INTERNATIONAL	
DESSINÉ/DRAWN K. GALAISE		
DATE: NOVEMBRE 2001		
VÉRIFIÉ/CHECKED		
CODE NP247	NOM/NAME WARNOCK HERSEY - BIS VISTA	
PAGE 1 DE 1	REVISION 0	DESSIN/DWG NP247



NOTE:

MATERIAL: ALUMINUM STICKER

REV.	DESCRIPTION	DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE	
DESSINÉ/DRAWN: C. GRIMARD		
DATE: NOV. 13, 01	TOLERANCES:	
ECH./SCALE: 1" = 1"	FRACT. ± 1/16" X.XX ± N/A X.XXX ± N/A; ANGLE ±2°	
VERIFIÉ/CHECKED:		
CODE: NP248	NOM/NAME: EPA NAME PLATE	
PAGE: 1 of 1	REVISION:	DESSIN/DWG: NP248

Manufactured by Security Chimneys International ltd. Model: BIS VISTA

US ENVIRONMENTAL PROTECTION AGENCY

MEET EPA PARTICULATE MATTER (Smoke) CONTROL REQUIREMENTS FOR NONCATALYTIC WOOD HEATERS BUILT ON OR AFTER JULY 1, 1990.

SMOKE

THIS MODEL

0 (GRAMS PER HOUR) 8.5

EFFICIENCY*

50% 60% 70% 80% 90% 100%

Wood heaters with higher efficiencies cost less to operate

*NOT TESTED FOR EFFICIENCY. THE VALUE INDICATED IS FOR SIMILAR EQUIPPED NONCATALYTIC WOOD HEATERS

HEAT OUTPUT

10,400 to 27,600 btu/hr

Use this to choose the right size appliance for your needs.

ASK DEALER FOR HELP

This wood heater will achieve low smoke output and high efficiency only if properly operated and maintained. See owner's manual.

NP249 REV.#0

5"

7"

NOTE:

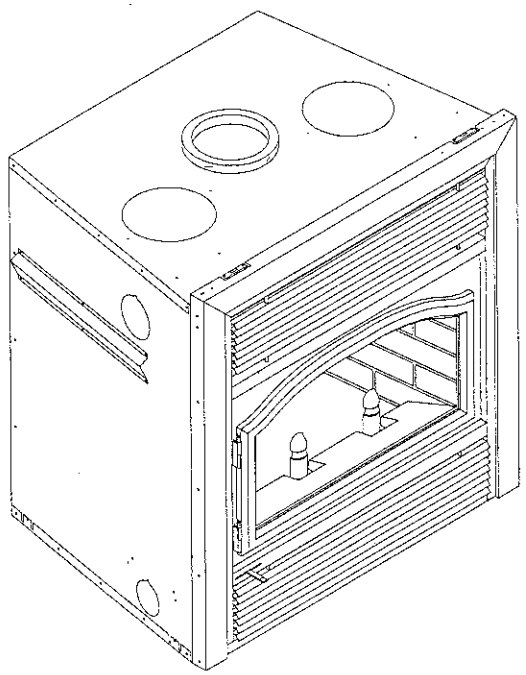
- PAPIER AUTOCOLLANT 5" X 7"
- LETTRAGE NOIR SUR FOND BLANC

REV.	DESCRIPTION		DE:
CONCU/DESIGNED: E. LAMY	SECURITY CHIMNEYS INTERNATIONAL LTD / CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE		
DESSINÉ/DRAWN: C. GRIMARD	TOLERANCES:		
DATE: 24 SEPT. 01	FRACT. ± 1/16"	ANGLE ±2°	
ECH./SCALE: 1" = 1"	X.XX ± N/A		
VERIFIÉ/CHECKED:	X.XXX ± N/A		
CODE: NP249	NOM/NAME: EPA SMOKE EFFICIENCY RATING		
PAGE: 1 de 1	REVISION	DESSIN/T:	NP249

APPENDIX F
Operator's Manual

SECURITY FIREPLACE

BIS Vista



Installation Instructions

This installation manual will help you obtain a safe, efficient, dependable installation for your fireplace and chimney system. Please read and understand these installation instructions before beginning your installation.

CAUTION: Do not attempt to modify or alter the construction of the fireplace or its components. Any modification or alteration of construction may void the warranty, listings and approvals of this system. In that case, Security Chimneys International Ltd will not be responsible for damages. Install the fireplace only as described in these instructions.

PLEASE RETAIN THIS MANUAL FOR FUTURE REFERENCE

WARNING: The fireplace cannot be operated without door. Consult your dealer to select the correct door model.

Warnock Hersey ®

Listed to standards ULC-S610
UL-127

SECURITY CHIMNEYS INTERNATIONAL LTD
2125 Monterey St., Laval, Quebec, Canada, H7L 3T6 Tel.: (450) 973-9999

Printed in Canada Rev. 00 Novembre 2001 PIBISVISTA

25 YEAR LIMITED WARRANTY

Security Chimneys International Ltd. warrants to the original consumer-purchaser that the woodburning fireplace Model BIS VISTA will be free from defects in material and workmanship, under normal use and service, for a period of twenty-five (25) years from the date of purchase.

This warranty shall be void if the fireplace is not installed in accordance with the installation instruction manual provided with the product and does not cover damage caused by misuse of the product. This 25 year warranty is limited to residential use of the product only.

WARRANTY LIMITATIONS:

1. During the first year of the limited warranty, Security Chimneys International Ltd. will provide replacement parts at no charge and will also pay for reasonable labor costs for repair work. All repairs must be approved by an authorized company official before any work is done. Labor costs to be borne by Security Chimneys International Ltd. must not exceed the retail price of the parts replaced.
2. During the second through the fifth years of the limited warranty, Security Chimneys International Ltd. will provide replacement parts (if available) at no charge, except for the parts listed below. ***Security Chimneys International Ltd. shall not be responsible for any labor costs.***

   The following parts are guaranteed for ***one*** (1) ***year***: Blowers, ceramic glass.

   The following parts are guaranteed for ***three*** (3) ***months***: Wood grate, refractories, firescreen, gaskets.
3. During the sixth through the twenty-fifth years of the limited warranty, Security Chimneys International Ltd. will provide replacement parts (if available) at 50% of the retail price, except the parts mentioned above. ***Security Chimneys International Ltd shall not be responsible for any labor costs.***
4. The following parts ***are not covered*** by the warranty: brass trims, panels, louvers.

This warranty may not be extended by our representatives in any manner whatsoever.

The warrantor makes no warranties express or implied, written or oral, other than those specifically stated in this 25 year limited warranty. The duration of any implied warranty including that of merchantability or fitness for any particular purpose shall be limited to 25 years from the date of purchase.

The remedy for damages as the result of any defect in this product which have been warranted herein is limited to replacement of defective parts and does not include any incidental or consequential damages or expenses sustained in connection with the product, including damage to property.

Security Chimneys International Ltd. is not responsible for inadequate fireplace system draft caused by air conditioning, heating, mechanical system or general construction conditions which may generate negative pressure in the property.

The chimney is covered by a separate 30 year limited warranty.

FOR UNITED STATES ONLY :

Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

NOTE: ***Dated proof of purchase is required for recognition of this warranty.***

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SAFETY RULES FOR OPERATING YOUR FIREPLACE MODEL BIS VISTA

Warning: The fireplace must be operated with the door fully opened or fully closed. If the door is left partly opened, smoke may be drawn into the room. If the unit is operated with the door fully opened, the optional firescreen must be used.

- Use only Security Fireplace glass door, specifically designed for the model BIS VISTA fireplace.
- When cleaning the fireplace, the ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible floor or on the ground outside the house, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.

Caution: Never use gasoline, kerosene, charcoal lighter fluid or similar liquids to start or rekindle a fire in this fireplace. Keep all such liquids well away from the fireplace at all times.

Caution: Keep combustible materials at least 48 inches away from the front of the fireplace opening.

Caution: Never leave children unattended when there is a fire burning in the fireplace.

WARNING: THIS FIREPLACE HAS NOT BEEN TESTED WITH AN UNVENTED GAS LOG SET. TO REDUCE RISK OF FIRE OR INJURY, DO NOT INSTALL AN UNVENTED GAS LOG SET INTO THIS FIREPLACE.

Warnock Hersey

C ® US

LISTED FACTORY BUILT FIREPLACE
FOYER PRÉFABRIQUÉ HOMOLOGUÉ

MODEL / MODÈLE: BIS VISTA

TESTED TO ULC S610 / UL 127
TESTÉ SELON (October / Octobre 2001)

CLEARANCES TO COMBUSTIBLES:	DÉGAGEMENTS AUX COMBUSTIBLES:
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CHIMNEY: 2" (51 mm)	CHEMINÉE: 2" (51 mm)

SECURITY CHIMNEYS INTERNATIONAL LTD
CHEMINÉES SÉCURITÉ INTERNATIONAL LTÉE.

LAVAL, QUÉBEC, CANADA

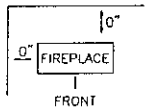
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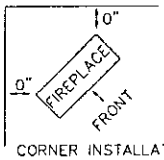
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INSTALL WITH MINIMUM CLEARANCES TO WALL AS SHOWN IN INCHES



BACKWALL AND FIREPLACE SIDE



CORNER INSTALLATION

INSTALL AND USE ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND LOCAL BUILDING CODES.

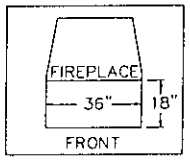
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KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROM APPLIANCE.

FLOOR PROTECTOR MINIMUM DISTANCE FROM OPENING IN INCHES



HEARTH EXTENSION MATERIAL :
- 3/8 " THICKNESS NON COMBUSTIBLE MATERIAL
- OR EQUIVALENTS

NP247 Rev. 0

5

THE FIREPLACE

INTRODUCTION

The BIS VISTA fireplace is an energy efficient, heat circulating, close combustion fireplace. You will receive a lifetime of comfort and enjoyment from your fireplace provided it is installed, maintained and operated properly.

- Please read these instructions and retain this manual for future reference.

- Before beginning the fireplace installation, consult the local authorities to obtain your building permit and check your local building codes. Install the fireplace only as described in these instructions and using only Security Chimneys International components.

- The BIS VISTA is not intended for use with a gas log. Failure to follow these instructions will void the certification and the warranty of the fireplace and may result in an unsafe installation.

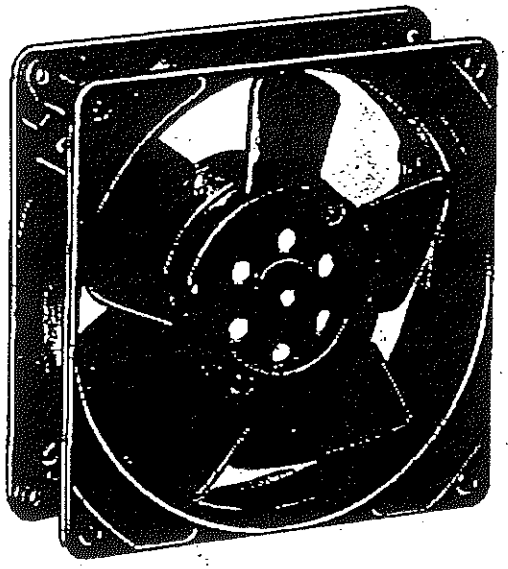
Parts required

- Fireplace model BIS VISTA
- Door set
- 6" diameter chimney model ASHT+, S-2100+, HT6000+ , HT6103+ or AC manufactured by Security Chimneys International only, including:
  - Chimney lengths
  - Elbows (where necessary)
  - Radiation shield, Attic radiation shield
  - Roof flashing
  - Rain cap
  - Supports (if necessary)

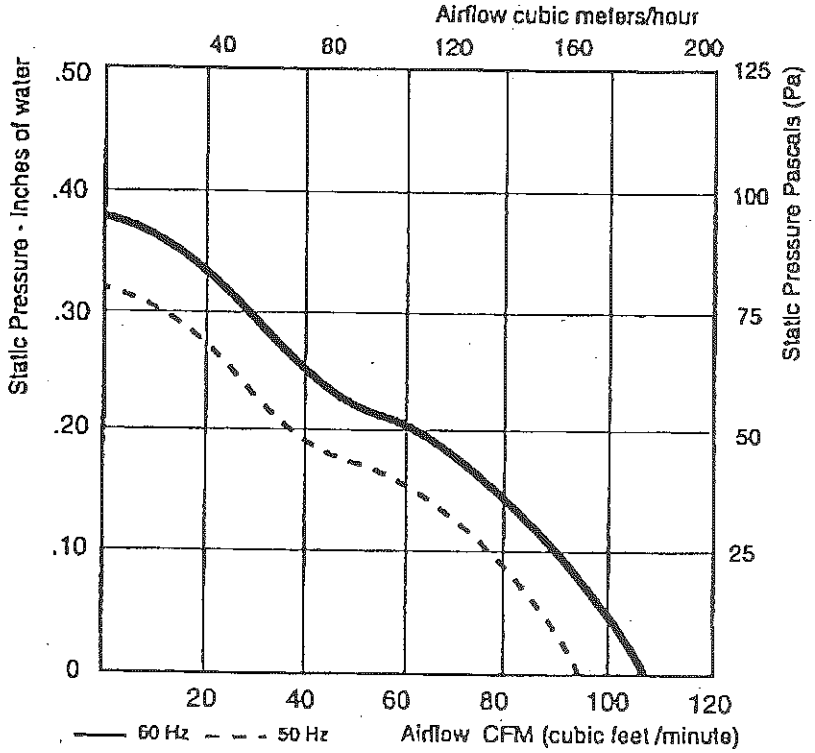
Additional Equipment (optional)

- 5" flexible venting system (central forced air kit)
- Gravity venting system
- Outside air kit
- Panel for clean face option (only with gravity venting system)
- Rigid firescreen
- Fireplace fan kit

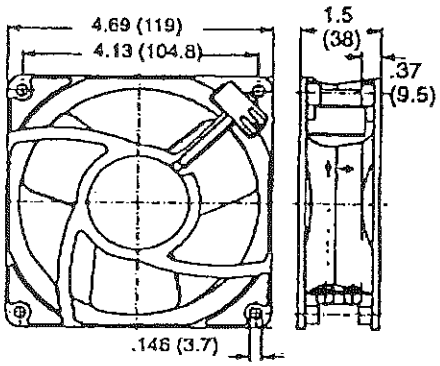
119 x 38mm (4.7" x 1.5") AC FAN



Terminals -
Mounting Bosses
Air Intake – Over struts(AX)
Air Exhaust – Over struts (VX)



DIMENSIONS



AVAILABLE WITH:

HIGH PERFORMANCE
SINTEC
SLEEVE BEARING SYSTEM

4.69" X 4.69" X 1.50" AC Fan, All Metal, Air Intake – Over struts

05-02-2001 04:09 CHEMINEES SECURITE INT. 4509732222 P.02/02

OPERATING THE BIS VISTA

Fuel

The BIS VISTA is designed to work best when fueled with seasoned cordwood. Hardwoods are preferred to softwoods since the energy content of wood is relative to its density. Hardwoods will result in a longer burning fire and less frequent refueling. A moisture content of 15% to 20% (seasoned) is recommended. Excessively wet wood will be difficult to burn and will result in lower efficiency, increased creosoting and deposits on the glass and in the chimney. Excessively dry wood will burn well but will also have higher emissions and shorter burning time.

Do not burn scrap or garbage, treated wood or wood such as driftwood from the ocean which has been exposed to salt or other chemicals. Salt or chemicals can corrode the firebox and chimney. Do not burn large amounts of paper, cardboard, Christmas tree branches or building construction materials. Intense firing with these materials may overheat the fireplace, causing damage to the unit, a fire or even possibly igniting a chimney fire if the chimney is creosoted.

First fires

Before using the fireplace make sure to remove the plastic wrapping on the door. Remove all remaining glue with mild soap.

The first 5 or 6 fires should be small fires of short duration (about 30 to 60 minutes). This will help cure the refractory bricks. The first fires may produce slight smoking due to drying of the paint and steel and any dust accumulated on the fireplace will burn off at this time. It may set off a smoke alarm located in the same room. For this reason the room should be well ventilated for the first few fires.

Building a fire

To start a fire, place several crumpled up balls of newspaper in the firebox. Place small dry pieces of kindling on top of the paper, crisscrossing the kindling so that there are airspaces in between. Keep the fuel far back enough so that air can get underneath. Open the air controls fully and light the newspaper. Once the newspaper is well ignited, close the door. Once the kindling fire is well established, cordwood can be added. (see Primary air combustion control section for proper operation of the air controls)

The unit will burn best with 2-3 pieces of cordwood spaced 1 to 2 inches apart and allowing air to get under the fuel. Crisscrossing or arranging the fuel so that air can get underneath, will help the fire to get started easily. The unit should be operated with the air control fully open long enough to get the cordwood well ignited.

Primary air and air boost controls

There is no flue damper in the BIS VISTA. As is common with air tight stoves, the combustion air control sets the flow of air entering the firebox. This allows more precise control of the fire. The combustion air control is located below the door on the left side. The main source of air (primary air) entering the firebox can be diminished by moving the air combustion control from left to right. The primary air is fully opened when the air control is completly moved to the left. The air control device can also be used to add an extra boost of air especially during fire start up and reloding of the unit. Pulling the air combustion control will induce an air boost at the base of the fire allowing an easier fire start up. When the fire is well established, the control can be pushed forward to shut down the air boost allowing a longer burn time. The combustion air control should be in the closed position (primary air and air boost) when the fireplace is not in use. This will minimize air leakage up the chimney. The combustion air control should be opened before opening the door to minimize the possibility of back draft coming into the room.

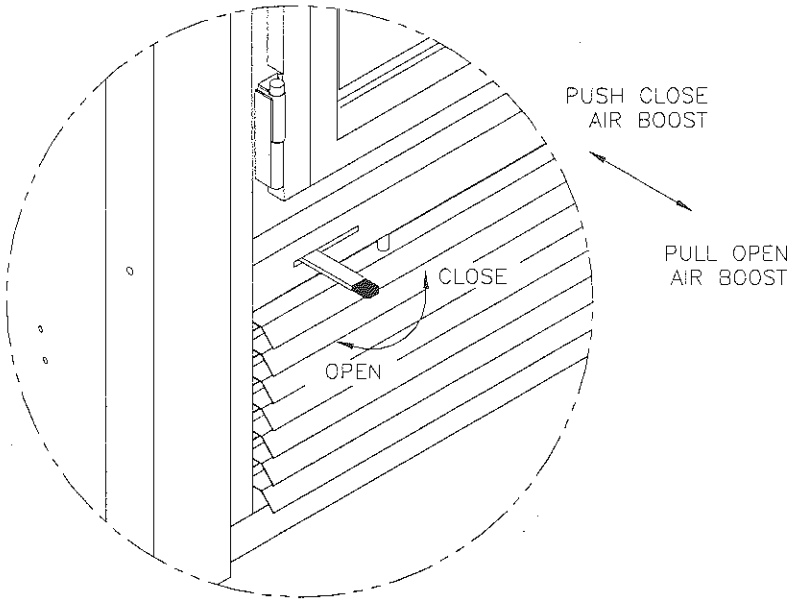
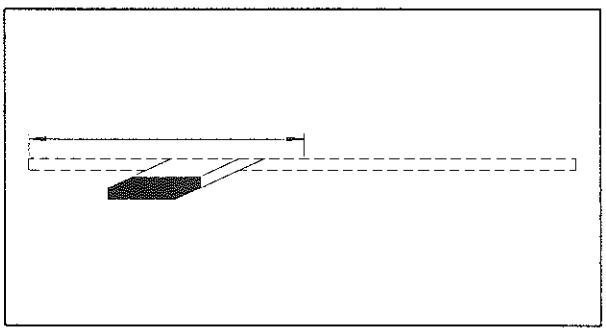


Figure 1

Accelerated combustion

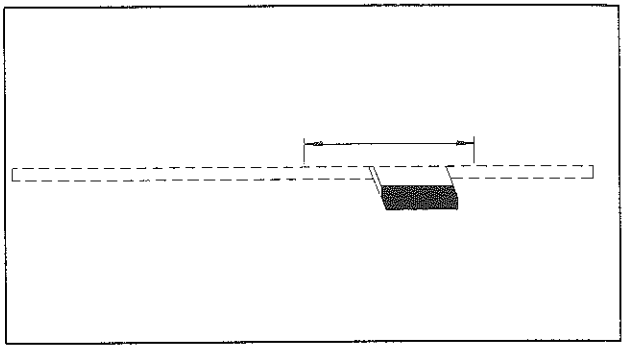
The maximum heat output for the BIS VISTA is achieved by burning with the door closed and the combustion air open opened and pulled back. With this method, the BIS VISTA can produce up to 60,000 BTU of heat per hour. However, it will be necessary to reload with wood every one or two hours. This is the least efficient method of burning the BIS VISTA.



Use caution when firing with the combustion air control wide open. Only burn cordwood in this manner. Small dry pieces of softwood and construction scraps will burn very intensely using this method and may damage the firebox.

Medium combustion

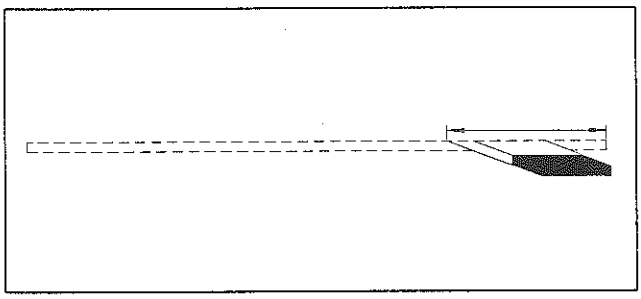
This is the recommended mode of operating the BIS VISTA and should be the one normally used since it will deposit the least amount of creosote on the glass and in the chimney. The combustion air control must be 3/4 closed and pushed forward to close the air boost. The precise setting will depend on many factors, including chimney length and the moisture content of the wood.



For instance, a long chimney will necessitate closing the damper more. To obtain the proper combustion, close the damper completely, then open it about 1/4" to 1/2". Three medium size pieces of wood should be burning on a bed of hot coals. The heat output will be approximately 30,000 BTU per hour and the loading time will be about every 3-4 hours. Softwoods may be burned using this method but the time will be substantially reduced.

Slow combustion

When the air combustion control is completely closed, the fireplace is in a slow combustion phase. Slow combustion will not stop the fire, but there will be a noticeable change in the flame pattern. The flames will be slow and may appear dirty if the wood is too wet (moisture content of 20% and more).



Creosote may accumulate on the glass door. This method of burning should be used only after operating the BIS VISTA with the air control opened to produce a hot fire for about an hour. Slow combustion can be used at night in order to reduce the heat output and to prolong the burn. The loading time will be between 6-8 hours.

Refueling for best performance

The BIS fireplace will operate best if attention is given to operating the unit with the damper fully opened after refueling in order to bring the firebox and the chimney system up to their optimum operating temperature. Combustion efficiency is relative to firebox temperature. A temperature of 500° C and up in the upper part of the firebox indicates a maximum efficiency. To obtain this temperature, the fireplace must be operated with the primary air and air boost controls fully opened during 10 to 20 minutes after reloading, depending on the heat and on the moisture content of the wood. Once you have reached the desired temperature, the air boost can be closed and the primary air set to a medium setting.You know you have reached the desired temperature when, closing the primary air control, you can see a flame at the top of the firebox. The benefit of this technique will be cleaner glass, less creosoting, greater efficiency and the most pleasing fire for your enjoyment. If your fireplace is equipped with a central forced air system, make sure the central blower is turned off during reloading to avoid smoking problems.

Smoking – Causes and Troubleshooting

To reduce the likelihood of smoking when opening the door, set the air controls to the "accelerated combustion" position before opening the door. Your fireplace has been designed and tested to provide smoke free operation. Occasionally, there may be a small amount of smoking upon lighting the fire, until the chimney heats up but this should not continue. If the fireplace continues to smoke it is probably for one of the following reasons:

1. Negative pressure in the house

As the fire burns, air goes up the chimney. This air must be replaced through leakage into the house or through the outside air duct When operating the BIS VISTA open a nearby window temporarily to check the adequacy of the replacement air supply.

2. Fans operating (e.g.: range hood)

These fans draw air out of the house and may actually cause a negative pressure in the house. Turn off all fans and open a nearby window to determine if this is the cause of the problem.

3. Wet wood

Wet or tarred wood will smolder and smoke instead of burn properly.

4. Dirty or blocked chimney

Check to make sure the chimney is clear and reasonably clean.

5. Chimney not long enough

The minimum chimney height is 12 ft. not including the fireplace height. The chimney must extend at least 3 feet (915 mm) above its point of contact with the roof and at least 2 feet (610 mm) higher than any roof or wall within 10 feet (3 m) of it. When installed with offsets, the minimum chimney height is 15 ft. Additional height will increase draught and will decrease the tendency to smoke.

6. Poor chimney draught

With no fire, there should be sufficient draught to exhaust cigarette smoke introduced under the baffle. Chimneys installed against an outside wall without protection may generate back draught problems which will cause start-up problems. To prevent such situation, open a nearby window, roll up a piece of paper and light it. Then, hold it in the upper part of the firebox to warm up the chimney. Wait until the draught is sufficient , then start the fire.

7. Blower for central forced air kit operating

Make sure that the blower is at the "off" position when you open the fireplace door for reloading.

IMPORTANT NOTES

1. Do not block the hot air vents to the fireplace as this will cause the fireplace to overheat.
2. Never start a fire using gasoline, kerosene, charcoal lighter fluid or any other combustible liquid.
3. Do not burn coal. The sulphur in coal will corrode the firebox.
4. Do not burn driftwood which has been in the ocean or salt water. The salt will corrode the firebox and chimney.
5. Do not burn wood in the area in front of the grate.
6. Do not abuse the unit by burning paper, or cardboard or construction material such as pressed wood, plywood or lumber.
7. Do not allow the wood to smoulder or burn without flame, since this will produce excessive creosote in the unit.

MAINTAINING YOUR BIS VISTA

Creosote

When wood is burned slowly without a flame, it produces tar and other organic vapors which combine with expelled moisture to form a black deposit called creosote which accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire. If the creosote accumulation is large, a creosote fire in the chimney can damage the chimney and overheat the surrounding wood framing. Creosote formation in a chimney can be minimized by making small hot fires rather than slow burning, smoldering fires and by proper refueling techniques.

Chimney maintenance

Regular chimney inspection and maintenance combined with proper operation will prevent chimney fires. Keep your chimney clean. Do not allow more than 1/16" creosote build up in your chimney. The amount of creosote will depend on variables such as frequency of use and type of fire. We recommend that you:

1. Initially inspect the chimney system weekly. From this, you will learn how often it will be necessary to clean your chimney.

2. Have your chimney cleaned by a qualified chimney sweep. If you wish to clean it yourself, we recommend using a stiff plastic or non-metallic brush. If a metal brush is used, its size should be slightly smaller than the flue to avoid damaging the chimney. Do not use a brush that will scratch the stainless steel interior of the chimney.

3. Do not expect chemical cleaners to keep your chimney clean. The rain cap can be removed for inspection and/or cleaning of the chimney. Using gloves, firmly grip the lower portion of the rain cap. Turn the cap 1/8 of a turn counterclockwise and lift it off the chimney.

Dealing with a chimney fire

Regular chimney maintenance and inspection can prevent chimney fires. If you have a chimney fire, follow these steps:

1. Close the fireplace door and the combustion air controls.
2. Alert your family of the possible danger.
3. If you require assistance, alert your fire department.
4. If possible, use a dry chemical fire extinguisher, baking soda or sand to control the fire. Do not use water as it may cause a dangerous steam explosion.
5. Check outside to ensure that sparks and hot embers coming out of the chimney are not igniting the roof.
6. Do not use the fireplace again until your chimney and fireplace have been inspected by a qualified chimney sweep or a Fire Department Inspector.

Finish door casing care

Use a glass cleaner and a soft cloth to polish the casing. Do not use abrasives such as steel wool or steel pads for they may scratch the casing's finish.

Ashes

Remove ashes only when the fire is out and the ashes are cold (24 to 48 hours after the fire is out)

Refractory replacement

The intense heat of the fire will normally cause hairline cracks in the refractory. These cracks can be minimized by proper curing as described in "First fires". They will not normally diminish the effectiveness of the refractory. If large cracks develop, then the refractory should be replaced. To replace the refractory bricks, follow these steps:

1. Remove the front refractories
2. Remove the bottom refractory
3. Remove the left side refractory
4. Remove the right side refractory
5. Remove the back refractory
6. Remove the front ceramic baffle
7. Remove the rear ceramic baffle

To install the new refractories, follow the above steps in reverse.

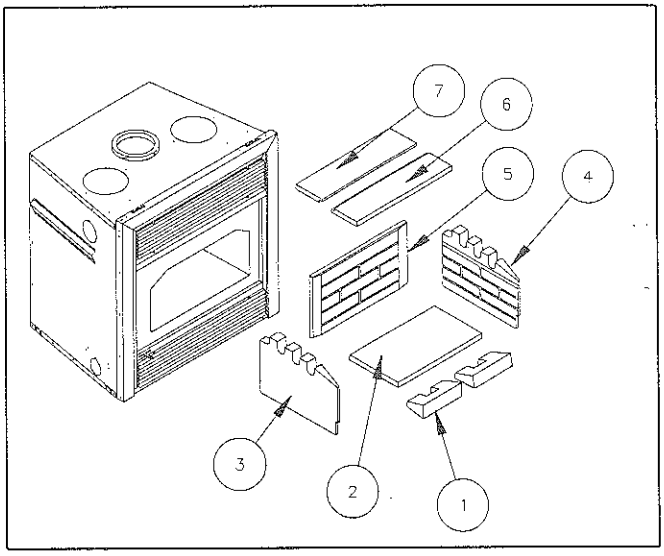


Figure 2

Door installation

The door must be installed only when the installation of the BIS VISTA is completed. All you have to do is fit the male part of the hinge, already fixed on the door, in the female part, which is already fixed on the fireplace. To remove the door, simply pull up the door from the hinges.

The door adjustment has been set at the factory. If the fit is still not perfect, you can adjust the door using the hinge screws (see fig.4).

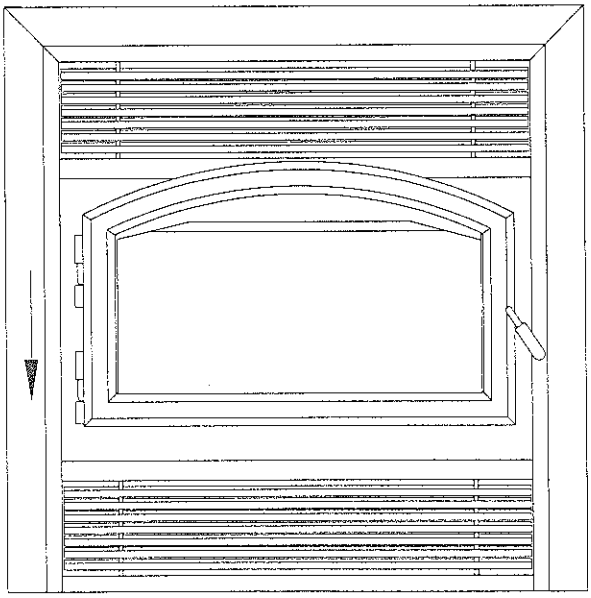


Figure 3

Door adjustment

The door may need to be adjusted to be completely airtight. The gaskets airtightness can be adjusted using the adjustment screw located on the right side of the fireplace façade. (An Allen key # 1/8 will be necessary for adjustment).

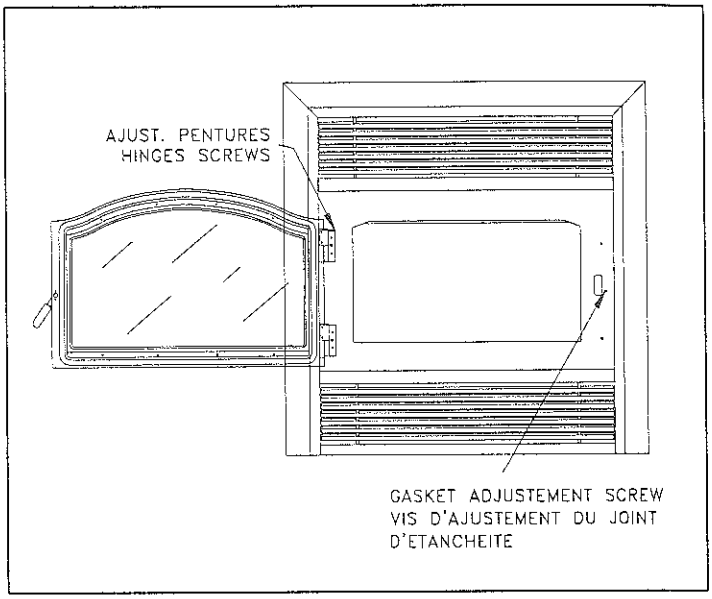


Figure 4

Glass care - Replacement

The glass used for the BIS VISTA is a high temperature glass (1400° F). If the glass breaks, it must be replaced with a ceramic glass. Tempered glass or ordinary glass will not withstand the high temperatures of the BIS VISTA. Replacement glass should be purchased from a Security Chimneys International dealer. Do not operate the unit with cracked or broken glass.

Glass care - Cleaning

The BIS VISTA is designed to keep the glass clean under normal operating conditions. If the BIS VISTA is operated continuously with the combustion air controls closed, the glass will tend to get dirty unless the fuel, firebox and glass are maintained at hot temperatures (see "Refueling for best performance) To clean the glass, there are a number of specially designed cleaners. Your authorized Security dealer can recommend a suitable cleaner which is available in your area. Regular household glass cleaners will not clean creosote. Do not use abrasives such as steel pads, steel wool or oven cleaner as they will scratch the glass.

Gasket replacement

Remove the door from the unit (see page 13) and lay them on a clean unabrasive surface. To replace the gasket, first remove all of the old gasket and gasket cement. Make sure that the surface is totally clean before applying new cement or adhesion problems may result. Apply gasket cement to the gasket channel and install the new gasket. This replacement part is available from your Security dealer in the following dimensions:

Gasket	Length	Quantity	Dimensions
Around glass	69"	1	5/16" dia.
On door frame	73"	1	5/8" dia.

FIREPLACE INSTALLATION

Locating the BIS VISTA

1. The best location for your fireplace is determined by considering the location of windows, door, and the traffic flow in the room where the fireplace is located, allowing space in front of the unit for the hearth extension and the mantel, and taking into consideration the location of the hot air ducts (optional), outside air kit and chimney. If possible, you should choose a location where the chimney will pass through the house without cutting floor or roof joists (see fireplace dimensions page 16).

2. Usually, no additional floor support is needed for the fireplace. The adequacy of the floor can be checked by first estimating the weight of the fireplace system. Weights are given in the appendix. Next, measure the area occupied by the fireplace which is normally 38" X 24 ½". Note the floor construction and consult your local building code to determine if additional support is needed.

3. The BIS VISTA may be installed directly on the floor or on a raised base (for proper guidelines, refer to **"Hearth extension requirements"**) and a minimum of 6'8" measured from the base of the appliance to the ceiling is required.

Hearth extension requirements

The BIS VISTA may be installed directly on a combustible floor, combustible floor in front of the fireplace must be covered whith non- combustible material (tile, marble, stone, etc.).

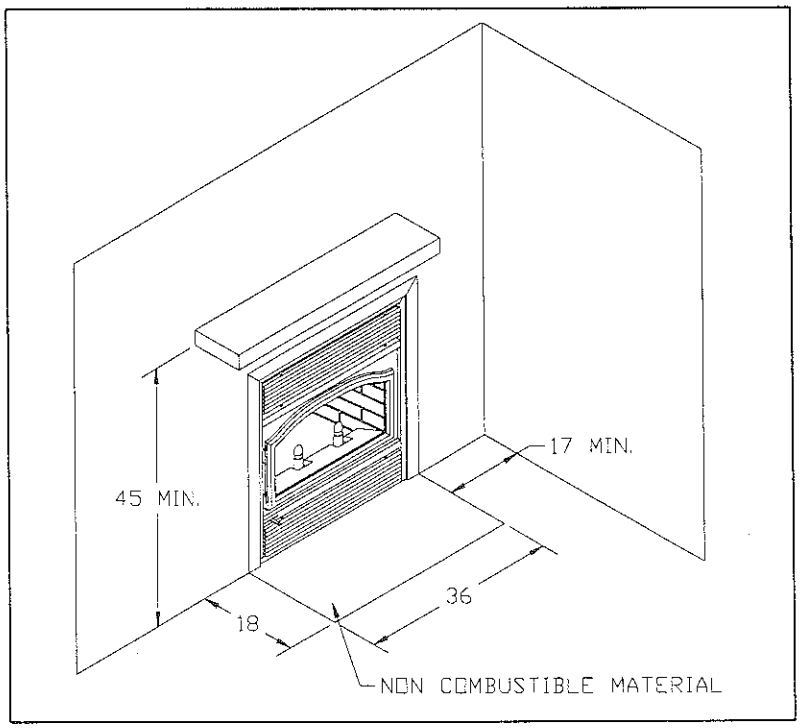


Figure 5

Framing, facing and mantel

The construction of the framing, facing, and mantel must be in accordance with the standards and the following illustrations (figures 7 to 11):

1. Frame the fireplace using 2" x 3" or heavier lumber.
2. **WARNING:** Combustible material cannot be used in the space directly above the fireplace. This area must remain empty for **a height of 6'8" (2032 mm) measured from the base of the appliance.**
3. Frame the fireplace with vertical studs at the sides of the fireplace running from floor to ceiling (see figure 8). If combustible facing is to be used, position the studs back, from the front edge of the fireplace, a space the thickness of the facing material so that the facing can be installed flush with the fireplace facing. Frame headers between the vertical studs only as follows:

- Place 2" x 3" or 2" x 4" headers, only along the upper part of the front, side and back faces. Do not put wood or any combustible material within the area above the fireplace except on the front facing.
- Place headers only as required to support the facing and mantel.

4. The fireplace must not be in contact with any insulation or loose filling material. Cover the insulation around the fireplace with gyproc panels

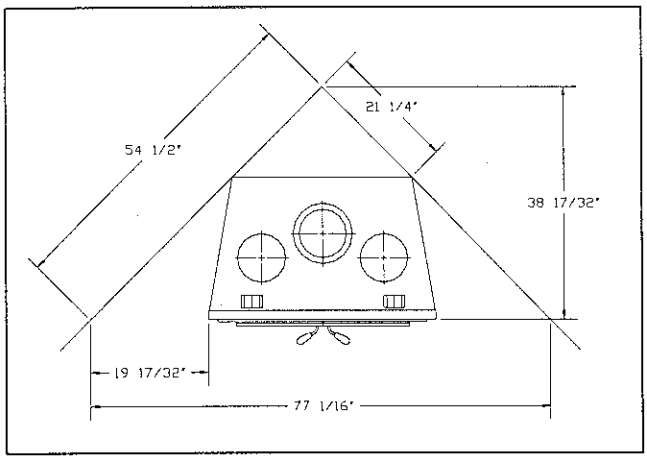


Figure 7

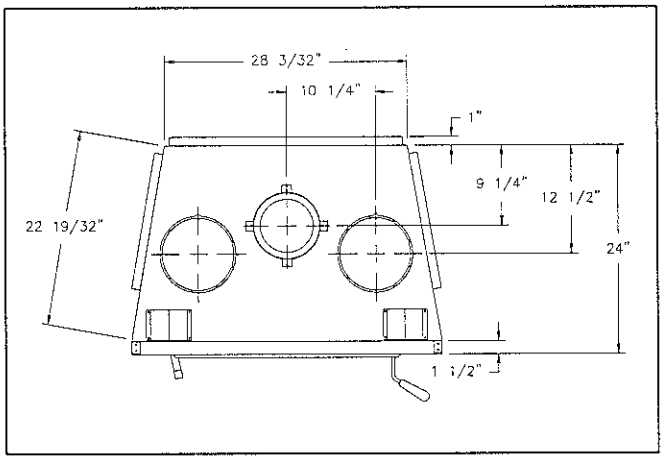


Figure 9

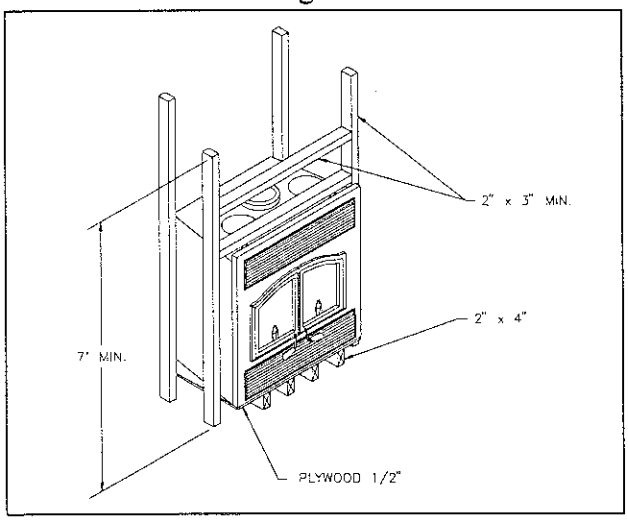


Figure 8

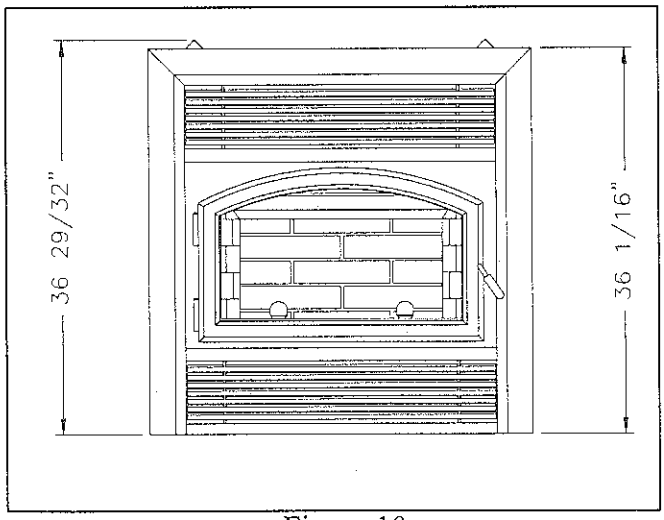


Figure 10

INSULATED CHASE CONSTRUCTION

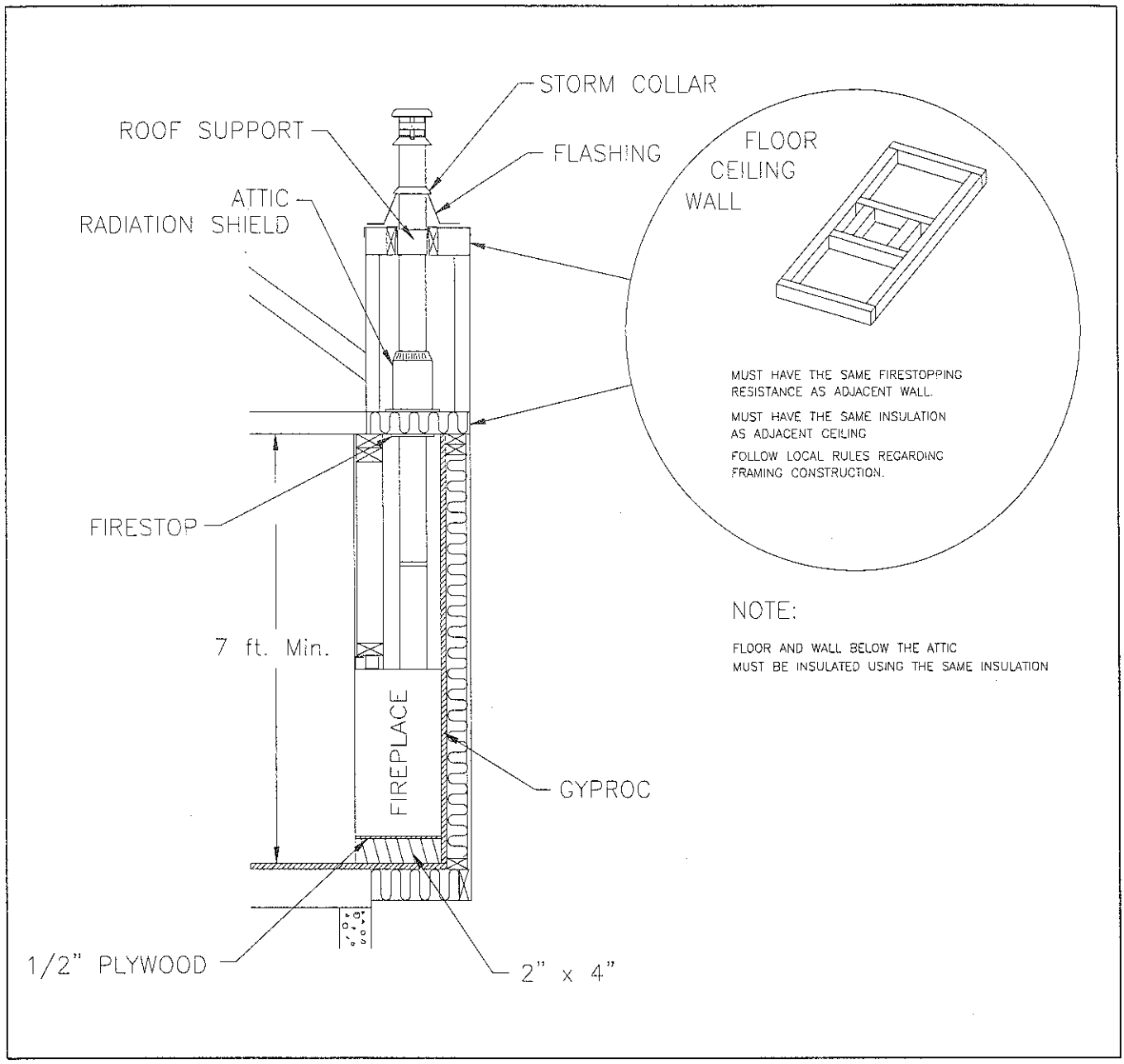


Figure 11

Facing

1. Combustible material must be installed flush with the fireplace. It may not project in front of and on the fireplace (i.e. the steel façade of the fireplace) (figure 12).
2. Non-combustible materials such as brick, stone or ceramic tile may project in front of and onto the fireplace facing (figure 13).

Mantel

The mantel must be installed at least 45" (1143 mm) above the base of the fireplace (figure 12).

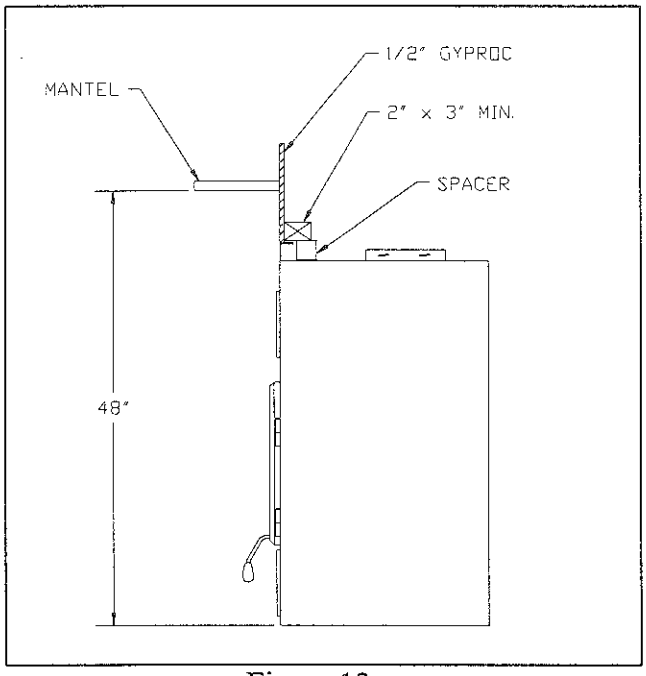


Figure 12

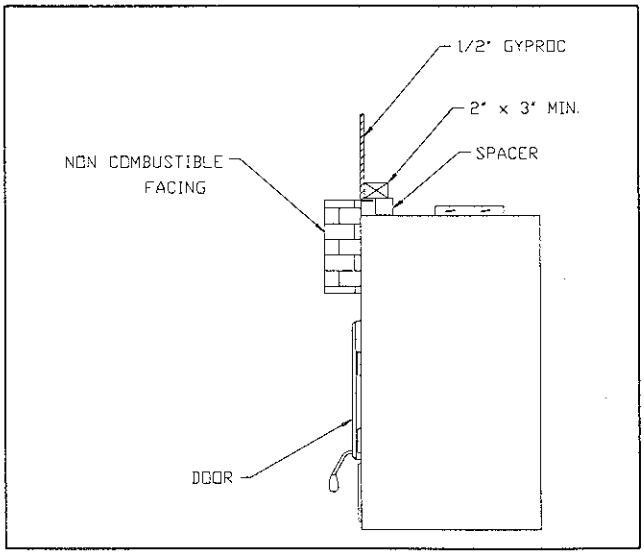


Figure 13

HOT AIR DUCTING INSTALLATION

Different hot air ducting systems can be installed with the BIS VISTA : - Gravity kit
- Forced air kit

Gravity kit

Two kits are available :

1. *Double hot air outlet including: (See Fig.15)*
   - 2 telescopic lengths 8" I.D.
   - 2 90° elbows 8" I.D.
   - 2 hot air outlet kits (louvers and frames)
   - 2 adaptors

2. *Single hot air outlet including: (see Fig.14)*
   - 2 6" lengths 8" I.D.
   - 1 hot air outlet kit (box, louver and frame)
   - 2 adaptors

See components list page 35.

The only fan that can be used with the gravity kit is the UZY3.

The gravity kit allows you to block the upper grill of the fireplace. To do so, follow the steps below:

a) Remove the upper grill and its frame from the fireplace.
b) Install the black panel (BHCF) making sure that the insulation strip is installed inside.
c) The fireplace façade can be covered with non-combustible material (fig. 18).

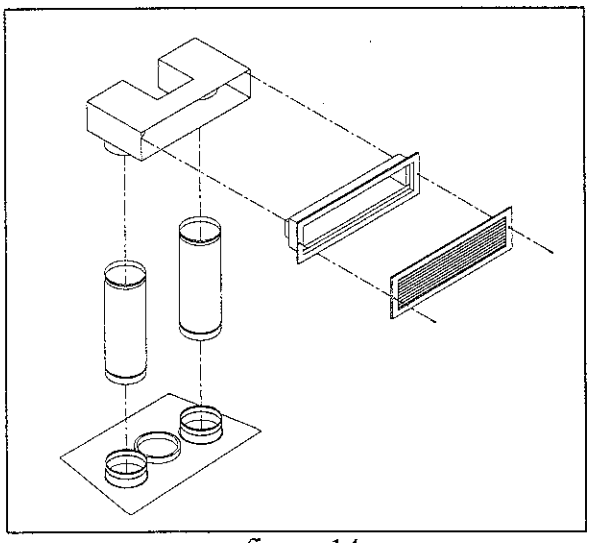


figure 14

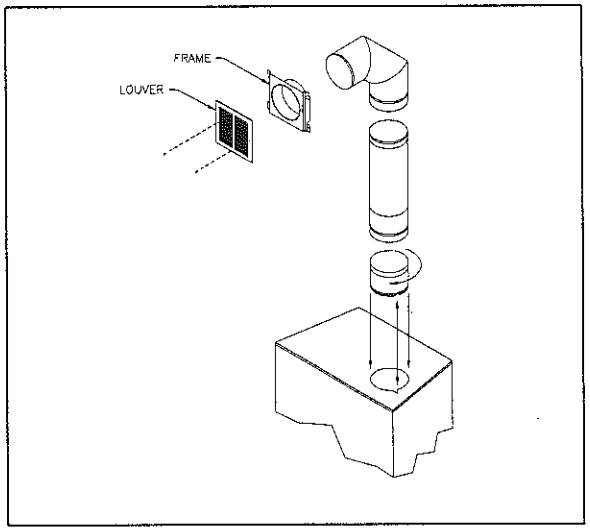


figure 15

The safety rules for hot air ducting gravity kit installation are the following:

Minimum height*	68" (1727 mm)
Maximum length	See figures 16 & 17

* The height of the louver must be measured from the base of the BIS to the middle point of the louver.

The single outlet system is designed to be installed either flush with the front of the BIS VISTA or extended out slightly from the face of the fireplace (if installing with a brick or thick facing for example). To extend the double outlet system, it will be necessary to purchase two adjustable lengths (7B26ZL2A). To extend the single outlet, it is necessary to install the insulation strip provided with the system. A maximum of 3 ½ ".(89 mm) of extension is provided by the single outlet system (see figure 17).

When installing the double outlet system, the hot air outlets can be installed in the same room as the fireplace, or one or both of the outlets can be installed in adjacent or upper rooms. Installing the ducts at different elevations will tend to exhaust more heat out of the higher outlet (figure 16).

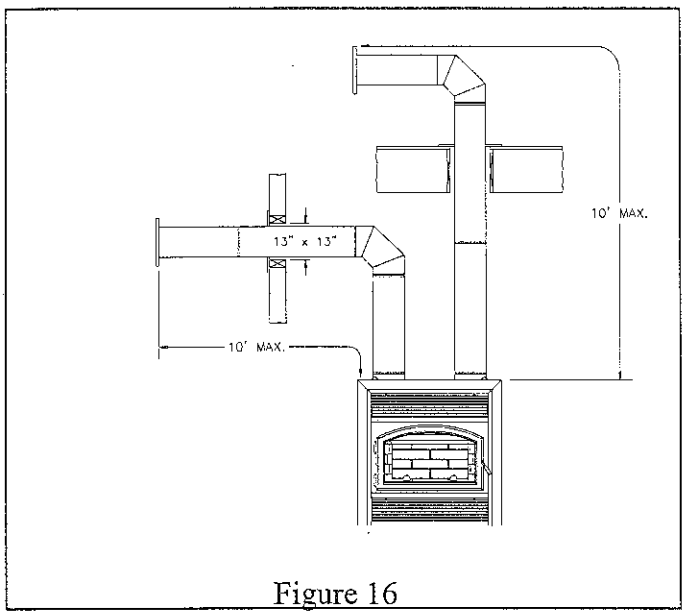


Figure 16

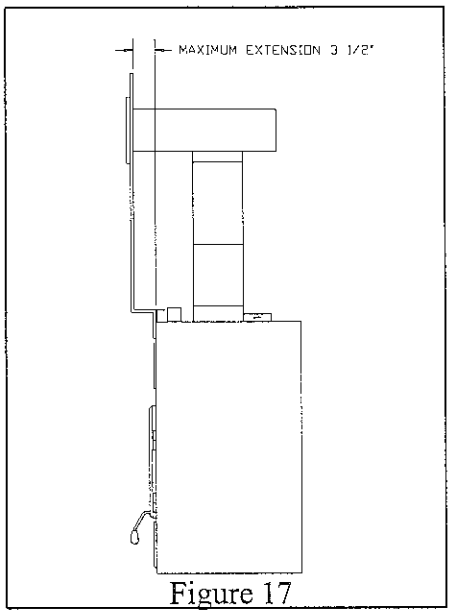


Figure 17

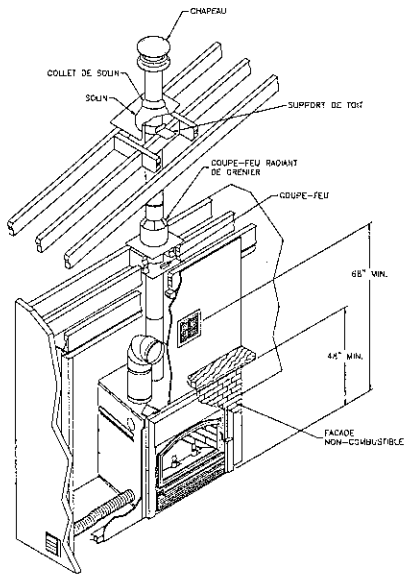


Figure 18

The duct system must be installed respecting the following :

1. Remove the plates closing up the 8" dia. holes on top of the fireplace. Then, cut the insulation in order to obtain two 8" dia. openings. Fix the adaptors on the fireplace openings by turning clockwise (figures 14 and 15).
2. Maintain at least a 2" (50mm) clearance between the ducts and any combustible material; the required hole size is 13" x 13" (330 mm x 330 mm).

   Exception #1: For the grills, the framing can be 10 ¾" x 10 ¾" (275 mm x 275 mm) to provide the clearance as required by the integral spacers on the double outlet duct system.

   Exception #2: For the single outlet, the framing must be 8 ¼" x 32 ¼" (210 mm x 820 mm) or as required by the integrated spacers. At no time should any combustible facing material such as panelling cover over any part of the grill face.

3. The maximum number of elbows in a run of duct is two.
4. Maintain at least 6 ½ " (160 mm) clearance from the outlet grill framing to a combustible ceiling, side wall or mantel.
5. When traversing a combustible wall or floor, a firestop must be installed at the wall or floor penetration. The hole size must be 13" X 13". (330 mm x 330 mm)
6. Do not connect the hot air ducts to a central heating system. Malfunction of the heating system's fan will cause the fireplace to overheat. Furnace duct is only single wall and not double wall as is required for the BIS VISTA hot air exhaust. For this type of installation refer to « **Central forced air kit** », next page.
7. Use only Security Chimneys International grills and components as described in this manual. Other grills or registers, for example, may be too restrictive and may overheat the fireplace or ceiling.
8. Do not use insulated flexible ducts as they will overheat.
9. Do not use tees or any other components than the ones specifically listed here.
10. All ducts must extend upwards or horizontally. Never try to route the ducting downwards.
11. The hot air outlet grills must be installed with the louvers pointing downwards in order to prevent overheating adjacent ceilings.

Central forced air kit (Not EPA "Environmental Protection Agency" approved)

The knock-outs provided on the back and on the sides of the BIS VISTA allow the connection of insulated flexible pipe which enables you to heat adjacent rooms up to 50 feet from the fireplace.

The ducting system must be installed as described below :

1. Fix the adaptor at the back and/or the side of the fireplace by twist-locking the adaptor to the fireplace. You can use more than one outlet on the fireplace (figure 19).
2. Attach the 5" flexible pipe, using the collars provided. Important: Make sure that the plastic wrapping around the flexible pipe will not be in contact with the fireplace.
3. Route the flexible pipe to the chosen location. The ducting system can be installed either in an upper room or in a lower room.
4. Attach the flexible pipe to the fan, using the collars (figure 20).
5. Fix the decorative grill fan adaptor to the fan.
6. Attach a standard 3" x 10" grill to the adaptor.
7. Install the *blower thermostat* in that part of the house to be heated by the hot air duct. Do not install the *blower thermostat* in the room where the fireplace is located. A *cooling thermostat* can be installed in the same room as the unit. This thermostat will turn on the blower when the room where the fireplace is located becomes too hot.

This option requires electricity. Make sure that the connections to the fan have been made according to the local codes and comply with their requirements.
It is possible to connect a flexible pipe to a central heating system. Make sure the pipe will be connected to the warm air supply duct, not to the return air duct (figure 21).

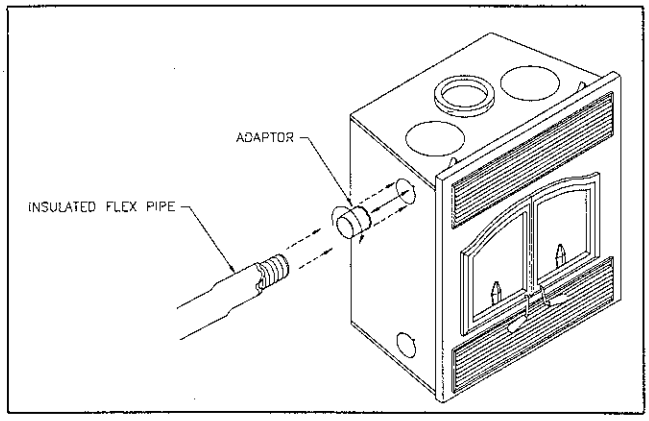


Figure 19

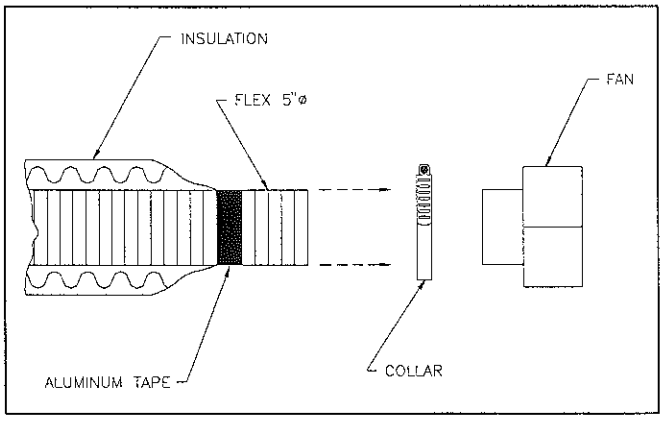


Figure 20

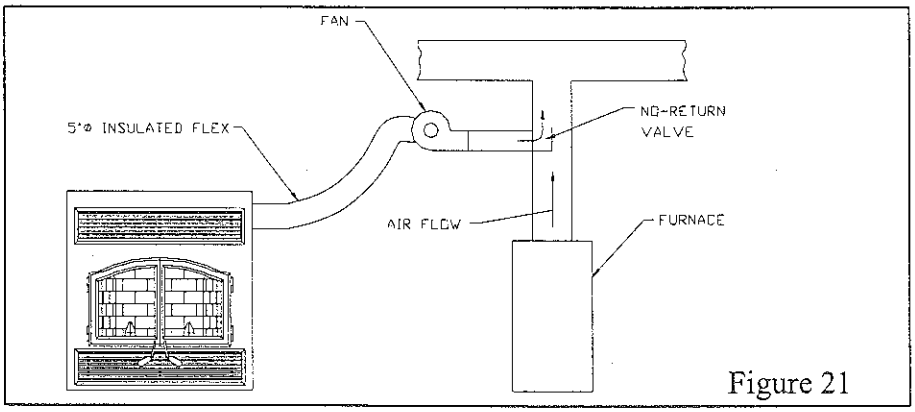


Figure 21

OUTSIDE AIR KIT (Optionnal)

During operation, the fireplace requires air for combustion and draws air out of the house. It may starve other fuel burning appliances such as gas or oil furnaces. As well, exhaust fans may compete for air, causing negative pressure in the house, resulting in smoke entering the house from the fireplace. This situation is aggravated in modern airtight houses. To overcome this potential problem, we **recommand the installation of an outside air assembly**.

The outside air assembly may be installed according to the following requirements :

1. Duct length should be kept to a minimum. The maximum length of duct is 20 ft. (6.1 m).
2. The air intake register must not be installed more than 7 ft. (2135 mm) above the base of the fireplace.
3. The fresh air must come from outside the house. The air intake must not draw air from the attic, from the basement or garage.
4. The air intake register should be installed where it is not likely to be blocked by snow or exposed to extreme wind and well away from automobile exhaust fumes, gas meters and other vents.
5. The duct and register may be installed above or below floor level.

Outside air installation

Thr following components are required : - Outside air kit (UZI)
- 4 " adapter for fireplace connection

Make a 4 ¼ " (110 mm) hole in the outside wall of the house at the chosen location. From outside, place the outside air register in the hole (open side down) and fasten the register to the wall, with screws as shown (see figure 22). Slip the pipe into the insulated sleeve. Place the insulated pipe over the register tube and over the fireplace's outside air connector (see figure 23). At each end, carefully pull back the insulation and plastic cover exposing the flexible pipe. Using the aluminium tape provided, wrap the tape around the joint between the flexible pipe and the air inlets. Carefully push the insulation and plastic cover back over the pipe. Using aluminium tape, fasten the plastic cover in place.

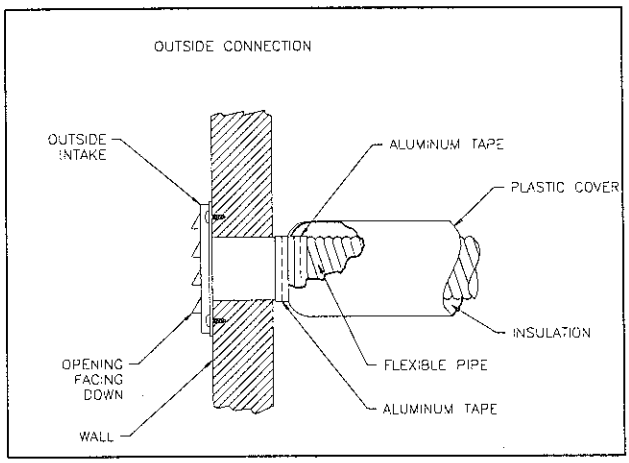


Figure 22

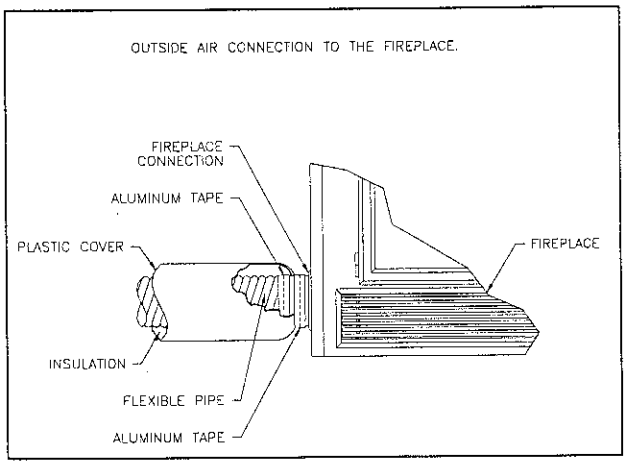


Figure 23

THE CHIMNEY

CHIMNEY INSTALLATION NOTES

1. If possible, install an interior chimney as it will provide better performance. In areas with continuous temperatures below. 18° C (0° F), the use of an exterior chimney increases the likelihood of operating problems such as low draught, high rate of creosoting, and poor startup characteristics. Exterior chimneys are also prone to downdrafting and flow reversal. Installations, which are located on lower floors in the house, such as in a basement, in combination with outside chimney, are especially prone to flow reversal.
2. The Security fireplace model BIS VISTA is listed only with Security Chimneys International Ltd 6" dia. chimney systems.
3. A chimney venting a fireplace shall not vent any other appliance.
4. The minimum chimney height, is 12 ft. (3.7 m).
5. All chimney installations must include at least one support. The maximum chimney length that can be supported by the fireplace is 9 ft. (2.75 m) for S2100+/HT6000+ , 12 ft. (3.7 m) for ASHT+ / HT6103+ and 26 ft. (8m) for AC chimney. In altitude, add 18".(450 mm) to the chimney for every 2000 feet (600 m) above sea level.

   Note: In areas where winter temperatures are normally below freezing, the air cooled chimney may produce condensation. This condensation may corrode the top of the fireplaces and is not covered under warranty. For optimum performance of your fireplace, Security Chimneys International recommends the use of an ASHT+ / HT6103+ or S2100+ / HT6000+ chimneys.
6. The chimney must extend at least 3 ft. (915 mm) above its point of contact with the roof and at least 2 ft. (610 mm), higher than any wall, roof or building within 10 ft. (3m) of it (Figure 24).
7. If the chimney extends higher than 5 ft. (1500 mm) above its point of contact with the roof, it must be secured using a roof brace.
8. A rain cap must be installed on top of the chimney. Failure to install a rain cap may cause corrosion problems.
9. Cut and frame square holes in all floors, ceilings, and roof that the chimney will go through to provide a 2" (50 mm) clearance between the chimney and any combustible materials. Do not fill this 2" space with insulation or any other combustible material.
10. Portions of the chimney which may extend through accessible spaces must be enclosed to avoid contact with combustible materials or damage the chimney.

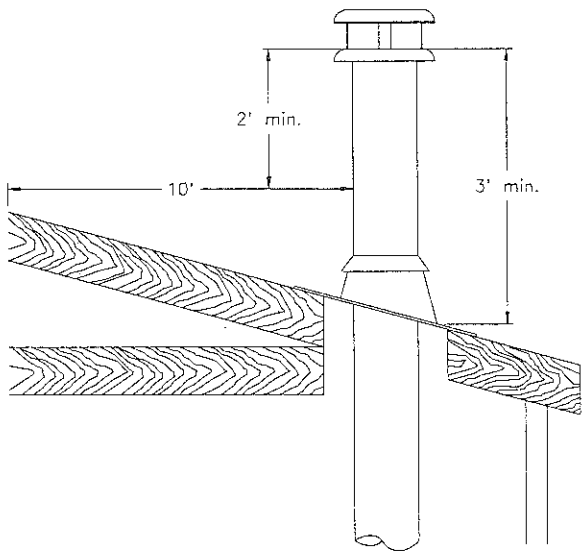


Figure 24

CHIMNEY INSTALLATION INSTRUCTIONS

1. Cut and frame the holes in the ceiling, floor and roof where the chimney will pass (see figure 25). Use a plumb bob to line up the center of the holes. The sizes are indicated in table 1 for the floor and ceiling holes and table 2 (page 27) for the roof holes.

CHIMNEY MODEL	SQUARE HOLE SIZE OPENING
ASHT+/HT6103+	12 3/8" (314 mm)
S2100+/HT6000+	14 1/8" (359 mm)
AC	15 " (380 mm)

Table 1

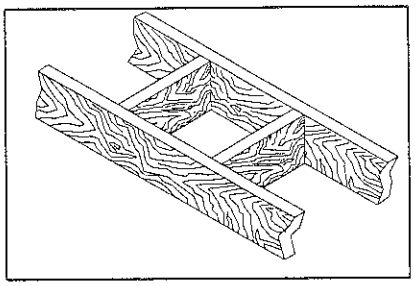


Figure 25

2. From below, install a firestop in each ceiling/floor separation through which the chimney will pass. At the attic level, install an attic radiation shield from above. (figures 26 & 27).
3. For ASHT+ / HT6103+ and S2100+ / HT6000+ chimneys, place the first chimney length on the fireplace. To lock it in place, turn ¼ of a turn clockwise. With the AC chimney, you must use a starter section before installing the first chimney length (figure 28). Continue installing chimney lengths making sure to lock each length in place.
4. Every time the chimney passes through a ceiling or a wall, install the appropriate firestop. When you reach the desired height, install the roof support. (Refer to instructions included with the support).
5. Then, put the roof flashing in place and seal the joint between the roof and the flashing with roofing pitch. (see figures 29 & 30). For sloping roofs, place the flashing under the upper shingles and on top of the lower shingles. Nail the flashing to the roof, using roofing nails.
6. Place the storm collar over the flashing, and tighten it with the bolt supplied. Finally, seal the joint between the storm collar and the chimney, using silicone caulking.
7. Install the chimney cap.

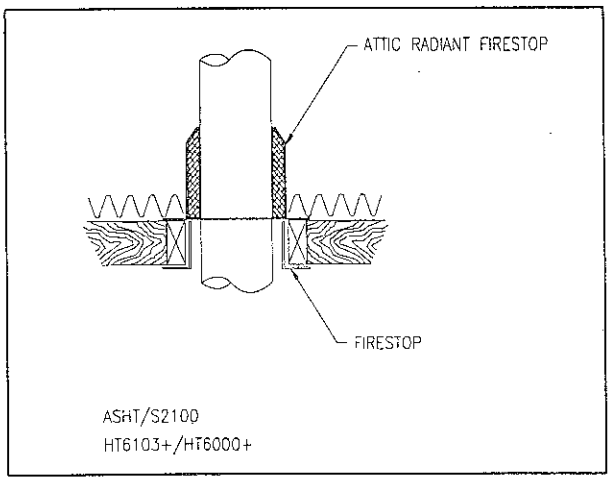


Figure 26

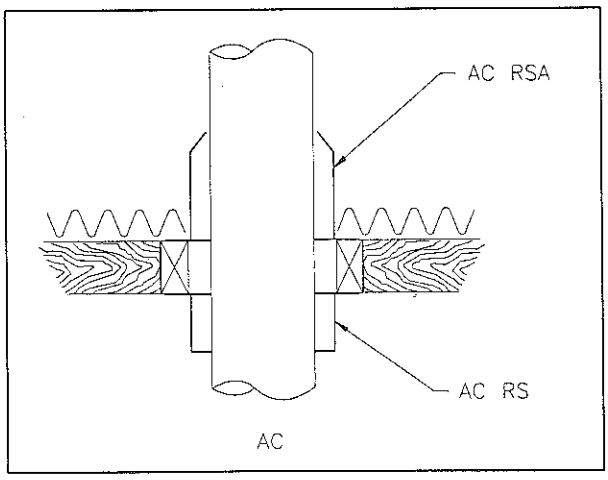
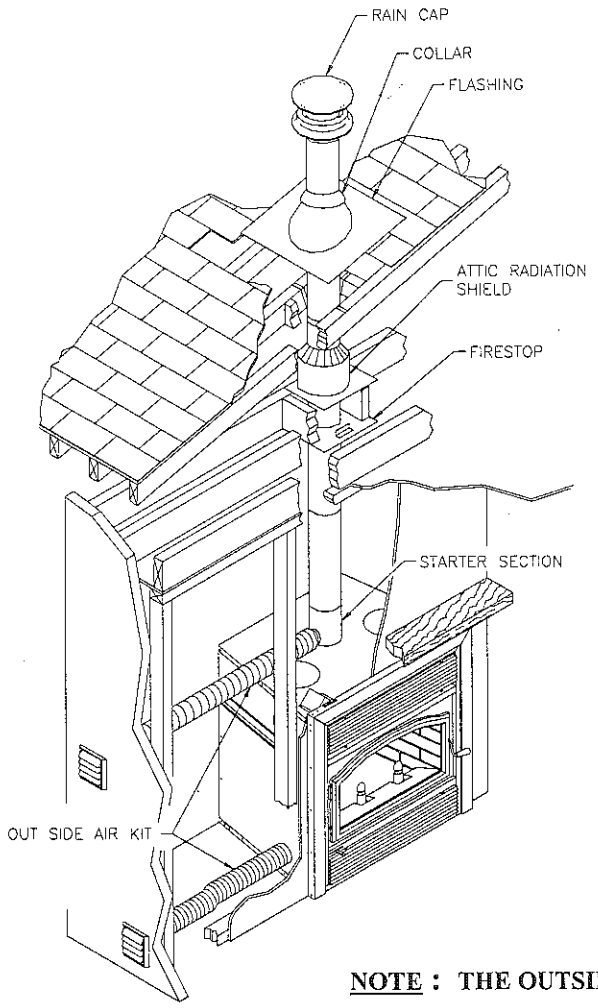


Figure 27

AC CHIMNEY INSTALLATION
(AIR COOLED GALVALUME CHIMNEY)



NOTE : THE OUTSIDE AIR KIT IS MANDATORY

Figure 28

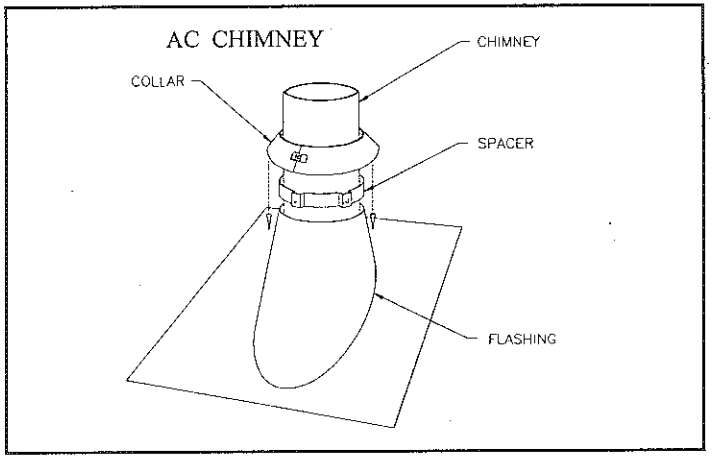


Figure 29

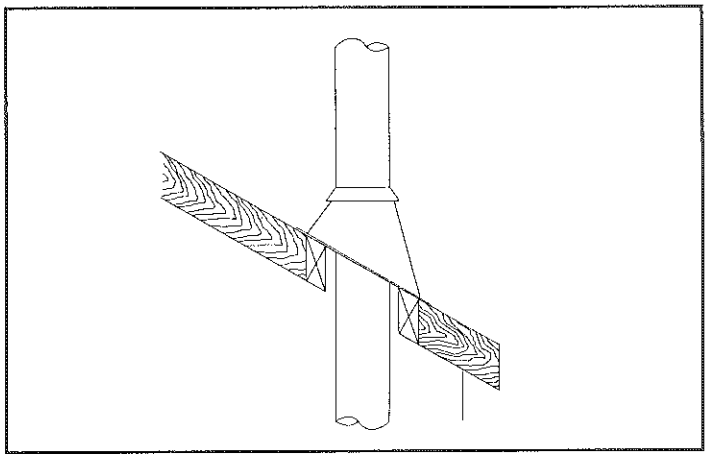


Figure 30

Table 2

ROOF DOWN SLOPE HOLE SIZE			
SLOPE	**ASHT+ / HT6103+**	**S-2100+ / HT6000+**	**AC**
Roff Pitch	**6"**	**6"**	**6"**
0 *	12 3/8" (314 mm)	14 1/8" (359 mm)	15" (380 mm)
2/12	12 9/16" (319 mm)	14 3/8" (365 mm)	15 3/8" (390 mm)
4/12	13" (330 mm)	14 7/8" (378 mm)	16 1/8" (410 mm)
6/12	13 7/8" (352 mm)	15 ¾" (400 mm)	16 7/8" (430 mm)
8/12	14 7/8" (378 mm)	17" (432 mm)	18 1/4" (465 mm)
10/12	16 1/8" (410 mm)	18 3/8" (467 mm)	19 5/8" (500 mm)
12/12	17 1/2" (445 mm)	20" (508 mm)	21 3/8" (545 mm)
* **CROSS SLOPE HOLE SIZE**			

OFFSET CHIMNEY INSTALLATON

The minimum chimney height when using elbows is :

Fireplace model	BIS VISTA
Chimney model	ASHT+ / HT6103+ / S-2100+ / HT6000+ / AC
Vertical installation	12 ft (3.66 m)
Two (2) elbows	15 ft. (4.57 m)
Four (4) elbows	17 ft. (5.18 m)

Table 3

After reaching the location requiring the elbow, proceed as follows :

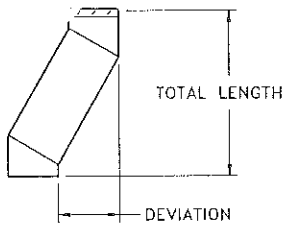
ASHT+/HT6103+/S2100+/HT6000+ Chimneys

1. Install the first elbow; turn it in the required direction. Fasten it to the chimney with the three (3) ½" (12 mm) metal screws provided with the elbow.
2. Install the necessary chimney lengths to achieve the required offset. Lock the chimney lengths together : it is recommended to use three (3) ½" (12 mm) screws . If the offset length is made of two (2) chimney lengths or more, use an offset support halfway up the offset. If penetrating a wall, install a wall radiation shield (see figures 32 & 33).
3. Use another elbow to turn the chimmney vertically. Secure the elbow, using three (3) ½" (12 mm) screws (provided with the elbow).
4. Use a plumb bob to line up the centre of the hole. Cut a hole for the chimney in the ceiling/floor. Frame this hole as described previously (refer to page 27).
5. From below, install a firestop. (See figure 26).
6. A support (ST+ or SO+) must be used on the first 15' section (5 m.).
7. Continue with the regular installation.

AC Chimney

1. Install the first elbow. Turn it in the required direction. To lock it in place, turn 1/8 of a turn. Fasten the straps attached to the elbow to the surrounding frame , using nails or drywall screws (figure 31).
2. Install the necessary chimney lengths to achieve the required offset. Lock the chimney lengths together. If penetrating a wall, use a wall radiation shield.
3. Use another elbow to turn the chimney vertically. Lock it to the chimney. Fasten the straps attached to the elbow to the surrounding framing using nails or drywall screws.
4. Use a plumb bob to line up the centre of the hole. Cut a hole for the chimney in the ceiling. Frame this hole as described previously.
5. From below, install a firestop. (see figure 27).
6. Continue with the regular installation.

N.B. : An AC-SB starter section must be used before installing an elbow. When an offset is needed immediately off the top of the fireplace, a starter section allowing a 4" offset (AC-SBO) is available.



CHIMNEY	ELBOW	DEVIATION & LENGHT	ONE LENGTH BETWEEN ELBOWS					TWO LENGTHS BETWEEN ELBOWS				
			8"	12"	18"	24"	36"	8' & 36"	12" & 36"	18" & 36"	24" & 36"	36" & 36"
ASHT+ 6" HT6103+	15°	DEVIATION	3" (156 mm)	4 1/4" (108 mm)	5 3/4" (146 mm)	7 1/4" (184 mm)	10 1/4" (260 mm)	12 1/4" (311 mm)	13 1/4". (337 mm)	14 3/4" (375 mm)	16 1/4" (413 mm)	19 1/2" (495 mm)
		LENGHT	16 1/2" (419 mm)	20 1/4" (514 mm)	26 1/4" (667 mm)	32" (813 mm)	43 1/2" (1105 mm)	50 1/2" (1276 mm)	54 1/4" (1378 mm)	60" (1524 mm)	65 3/4" (1670 mm)	77 1/2" (1967 mm)
	30°	DEVIATION	7 1/2" (190 mm)	9 1/2" (241 mm)	12 1/2" (318 mm)	15 1/2" (394 mm)	21 1/2" (546 mm)	25" (635 mm)	27" (9686 mm)	30" (762 mm)	33" (838 mm)	39" (991 mm)
		LENGHT	20 3/4" (527 mm)	24 1/4" (641 mm)	29 1/2" (749 mm)	34 3/4" (883 mm)	45" (1143 mm)	51 1/4" (1302 mm)	54 3/4" (1391 mm)	60" (1524 mm)	65 1/4" (1657 mm)	75 1/2" (1918 mm)
	45°	DEVIATION	10 13/16" (275 mm)	14 3/8" (365 mm)	17 7/8" (454 mm)	22 13/16" (579 mm)	31 5/16" (795 mm)	36 5/32" (918 mm)	39 11/16" (1008 mm)	43 7/32" (1098 mm)	48 5/32" (1223 mm)	56 21/32" (1439 mm)
		LENGHT	18 13/16" (478 mm)	22 3/8" (568 mm)	25 7/8" (657 mm)	30 13/16" (783 mm)	39 5/16" (999 mm)	44 5/32" (1122 mm)	47 11/16" (1211 mm)	51 7/32" (1301 mm)	56 5/32" (1426 mm)	64 21/32" (1642 mm)

CHIMNEY	ELBOW	DEVIATION & LENGHT	ONE LENGTH BETWEEN ELBOWS					TWO LENGTHS BETWEEN ELBOWS				
			8"	12"	18"	24"	36"	8" & 36"	12" & 36"	18" & 36"	24" & 36"	36" & 36"
S2100+ 6" HT6000+	15°	DEVIATION	3" (76 mm)	4 1/4" (108 mm)	5 3/4" (146 mm)	7 1/4" (184 mm)	10 1/4" (260 mm)	12 1/4" (311 mm)	13 1/4" (337 mm)	14 3/4" (375 mm)	16 1/4" (413 mm)	19 1/2" (495 mm)
		LENGHT	16 1/2" (419 mm)	20 1/4" (514 mm)	26 1/4" (667 mm)	32" (813 mm)	43 1/2" (1105 mm)	50 1/2" (1383 mm)	54 1/4" (1378 mm)	60" (1524 mm)	65 3/4" (1670 mm)	77 1/2" (1969 mm)
	30°	DEVIATION	7 1/2" (191 mm)	9 1/2" (241 mm)	12 1/2" (318 mm)	15 1/2" (394 mm)	21 1/2" (546 mm)	25" (635 mm)	27" (686 mm)	30" (762 mm)	33" (838 mm)	39" (991 mm)
		LENGHT	20 3/4" (527 mm)	24 1/4" (616 mm)	29 1/2" (749 mm)	34 3/4" (883 mm)	45" (1143 mm)	51 1/4" (1302 mm)	54 3/4" (1391 mm)	60" (1524 mm)	65 1/4" (1657 mm)	75 1/2" (1918 mm)

CHIMNEY	ELBOW	DEVIATION & LENGHT	ONE LENGTH BETWEEN ELBOWS					TWO LENGTHS BETWEEN ELBOWS				
			---	12"	18"	36"	48"	---	12" & 48"	18" & 48"	36" & 48"	48" & 48"
AC 6"	15°	DEVIATION	---- ----	4 13/16" (122 mm)	6 1/8" (156 mm)	11" (280 mm)	14 1/8" (359 mm)	---- ----	16 7/8" (429 mm)	18 7/16" (468 mm)	23" (584 mm)	26 3/16" (665 mm)
		LENGHT	---- ----	27 11/16" (703 mm)	33 1/2" (851 mm)	50 7/8" (1292 mm)	62 1/2" (1588 mm)	---- ----	72 5/8" (1845 mm)	78 7/16" (1992 mm)	95 3/4" (2432 mm)	107 3/8" (2727 mm)
	30°	DEVIATION	---- ----	9 3/8" (238 mm)	12 3/8" (314 mm)	21 3/8" (543 mm)	27 3/8" (695 mm)	---- ----	32 5/8" (829 mm)	35 5/8" (905 mm)	44 5/8" (1134 mm)	50 5/8" (1286 mm)
		LENGHT	---- ----	25 3/4" (654 mm)	31" (787 mm)	46 1/2" (1181 mm)	57" (1448 mm)	---- ----	66" (1676 mm)	71 1/4" (1810 mm)	86 7/8" (2207 mm)	97 1/4" (2470 mm)

Note: With the AC chimney, a starting lenght of 6" high must be used on top of the fireplace before installing

Table 4

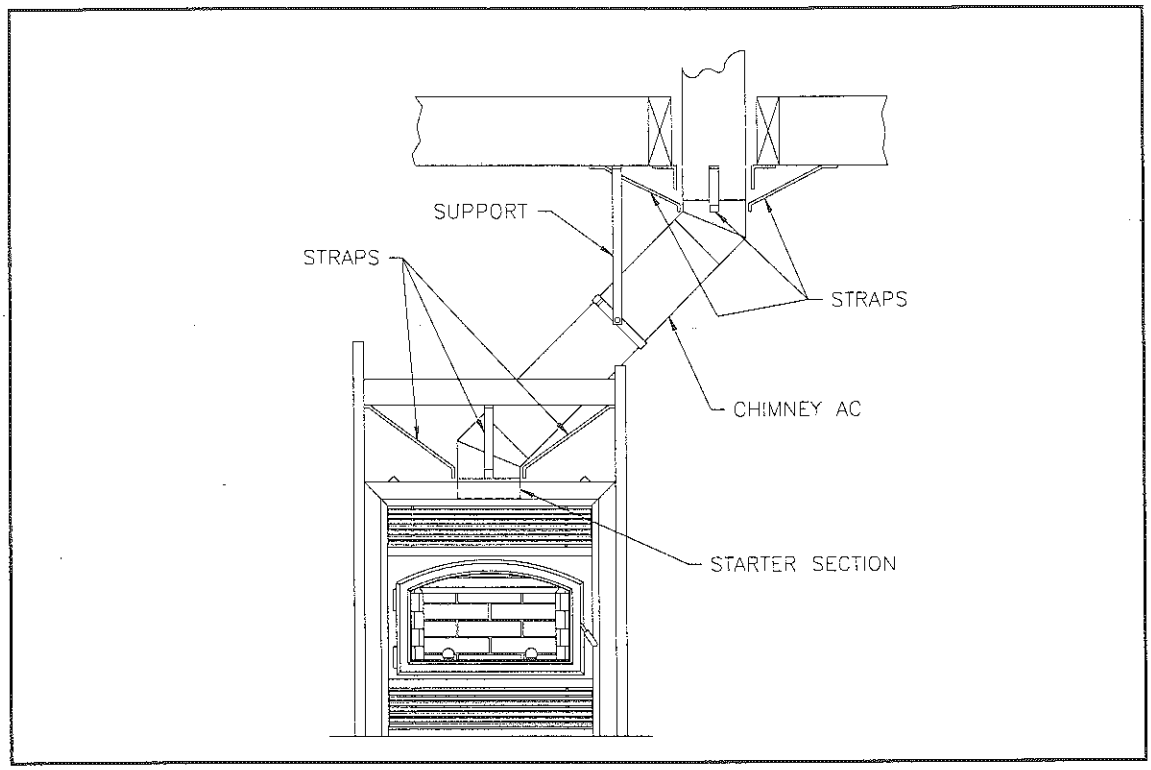


Figure 31

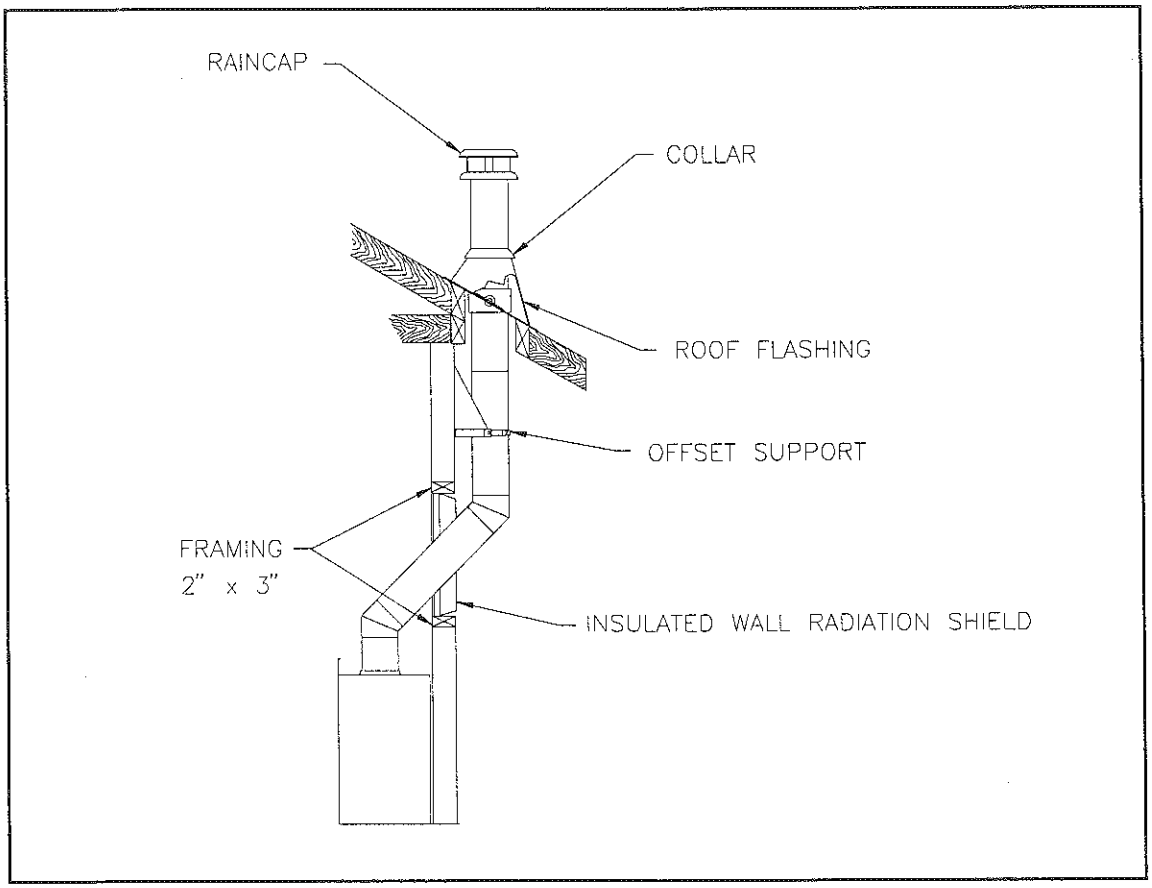


Figure 32

ANGLED WALL RADIATION SHIELD (RSM+, RSMI30, RSMI45)

When traversing a combustible wall with the chimney at a 30° or 45° angle, an angled firestop or wall radiation shield must be installed. Only one is required.

Note: 45° angle for Canada only

In cold climate locations, we recommend that you use the insulated wall radiation shield since it will maintain the home's thermal barrier.

RSM+ and RSMI30, RSMI45		
CHIMNEY MODEL	ANGLE	HOLE SIZE
ASHT+ / HT6103+ (6" dia.)	30°	283 mm x 781 mm (11 1/8" x 30 ¾")
Canada only	45°	283 mm x 518 mm (11 1/8" x 20 3/8")
S2100+/HT6000+ (6" dia.)	30°	327 mm x 881 mm (12 7/8" x 34 11/16")
AC (6" dia.)	30°	380 mm x 972 mm (15" x 38 ¼")

Table 5

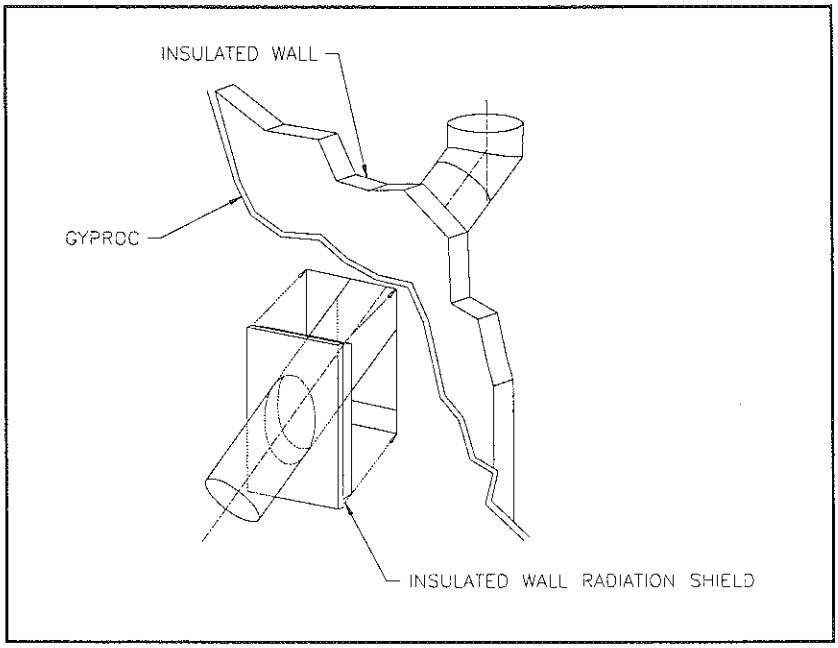


Figure 33

CHIMNEY SUPPORT INSTALLATION

Universal roof support

This support has three possible uses :

1. For ASHT+/HT6103+ and S2100+/HT6000+, it must be used on a roof to support the chimney.
2. It may be used on a floor, ceiling or roof above an offset to support the chimney above the offset.
3. It may be used on a floor, ceiling or roof as a supplementary support when the chimney height exceeds 15 ft. (4.6 m.).

Table 6 gives maximum height of supported chimney.

NOTE: For the AC chimney, a support section must be used every 40 ft. (12 m) instead of the ST.

For roof support installation, refer to the instructions provided with the support.

Universal offset support

This support is used to support the chimney above an offset. When the chimney offset is used to traverse a wall this support may be used on the wall to support the chimney. The maximum heights are given in Table 6. For offset support installation, refer to the instructions provided with the support.

CHIMNEY MODEL	MAXIMUM HEIGHT OF SUPPORTED CHIMNEY	
	OFFSET SUPPORT	ROOF SUPPORT
ASHT+ / HT6103+ (6" dia.)	28 ft. (8.54m)	29 ft. (8.84 m)
S-2100+ / HT6000+ (6" dia.)	18 ft. (5.49 m)	20 ft. (6.1 m)
AC (6" dia.)	40 ft. (12.19 m)	50 ft. (15.20 m)

Table 6

CHIMNEY CHASE AND MULTIPLE TERMINATIONS

For the purpose of this manual, a chimney chase is considered a part of the chimney system rather than part of a building. The termination must be placed a minimum of 18" (460 mm) above the chase.

For installations where more than one chimney is located in the same chase or within the same area, we suggest that their terminations be separated by at least 16" (410 mm) horizontally, and 18" (460 mm) vertically. This separation is to prevent smoke migrating from one chimney to another (see figure 34).

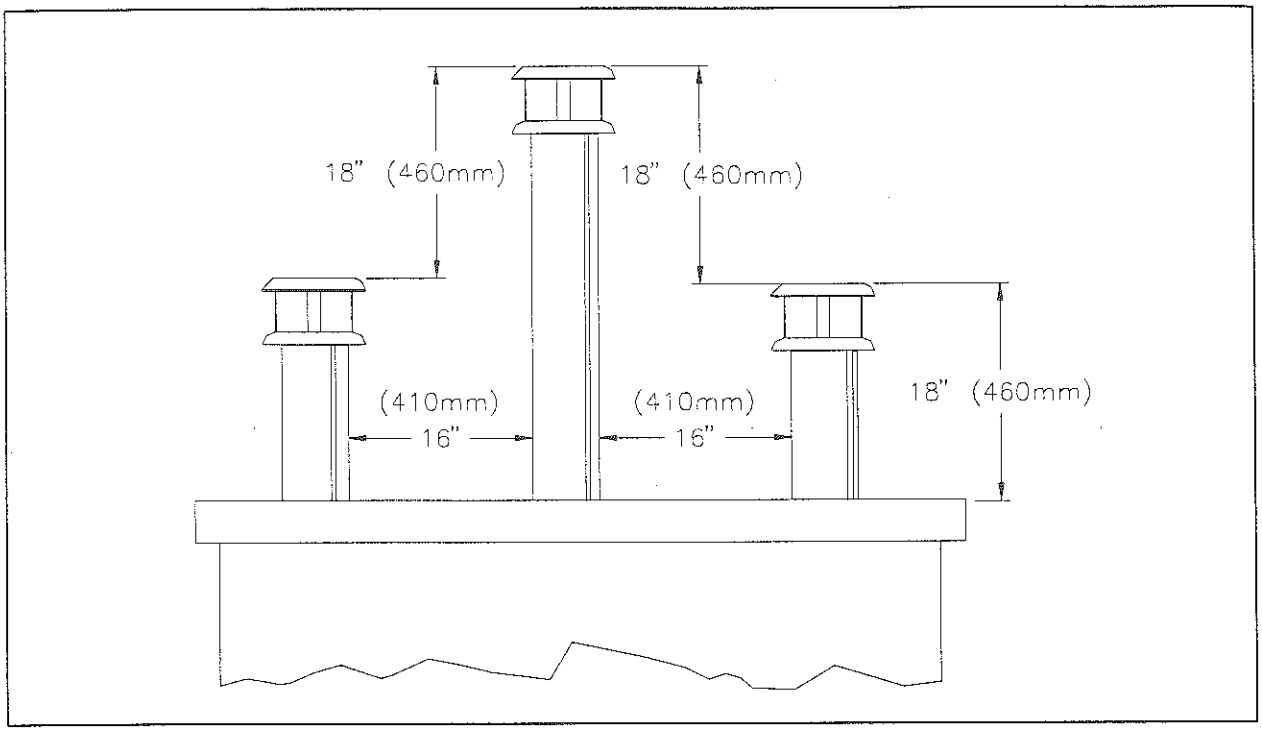


Figure 34

CHIMNEY ADAPTOR (S-2100+ / HT6000+)

The fireplace is normally supplied with a chimney adaptor suitable for the ASHT+ / HT6103+ chimney. If you want to install a S-2100+ / HT6000+ chimney, an adaptor is available (6UCA) (figure 35). A separate starter section will also be required if AC chimney is installed.

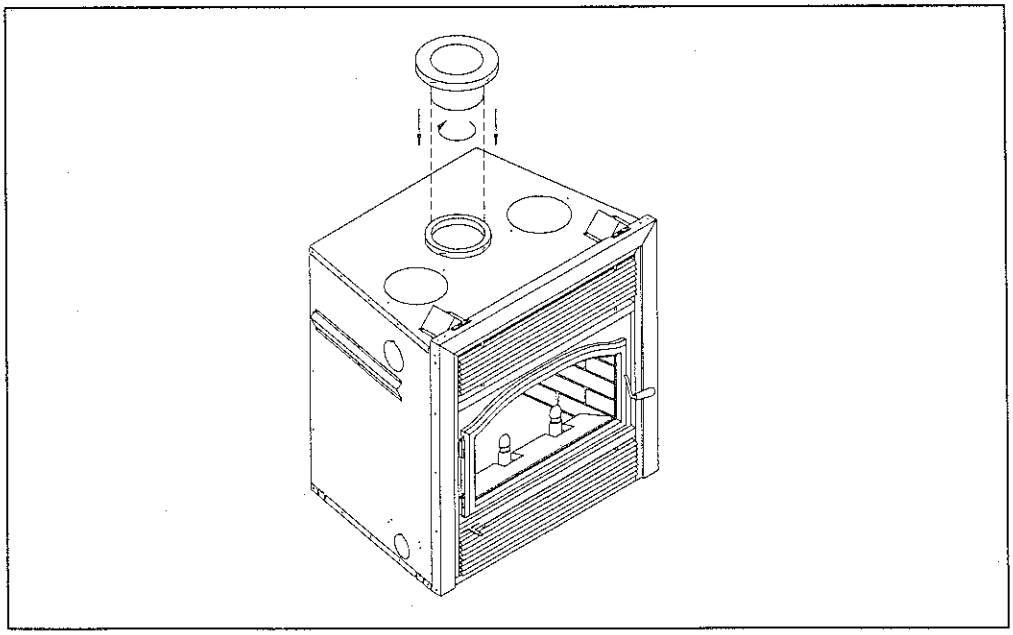


Figure 35

INSTALLATION INSTRUCTIONS FOR MASONRY APPLICATION

WARNING: Before starting the installation, the masonry chimney must be inspected by a qualified sweep.

The following requirements must be respected:

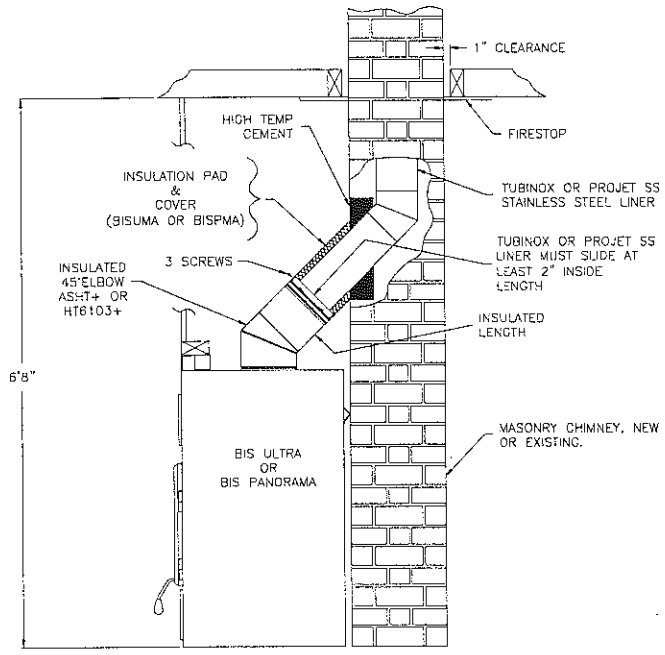
1. The chimney must be absolutely clear of any soot residue or creosote. Check for cracks, loose or missing bricks that could inhibit correct installation of the liner.
2. The clearance to combustible must be a minimum of 1" between the outside of the masonry and any wood framing or loose insulation.
3. The chimney must be built in accordance with the current building code.
4. No other appliance can be connected to the same chimney.
5. The clearances to combustible for the BISUMA or BISPMA and BISUMA30 or BISPMA30 connectors are 2" on the side and bottom and 16" at the top.
6. **The connector parts are not necessary if the connection between the insulated length and the stainless steel liner is done within the masonry chimney.**

stallation:

e chimney must be relined with a stainless steel liner model Tubinox or Projet SS of the same diameter as the outlet of the fireplace.

r connection at 45° angle, a special connector (BISUMA for the BIS VISTA fireplace or BISPMA for the BIS Panorama fireplace) must be used to connect the liner to the insulated chimney. For connection at 30°, use the BISUMA30 or BISPMA30 connectors.

See typical installation illustrated below.



Follow these steps:

1- Position the fireplace in its location. Temporarily install the ASHT+ elbow on the top of the fireplace and, using a level, mark with an oval the location where the flue liner will enter the masonry chimney.

2- In the middle of the oval, drill a hole in the masonry chimney at 45° or 30°.

3- Increase the size of the hole until a 45° or 30° Tubinox liner elbow can be easily slipped through.

4- Slide the liner down from the top of the masonry chimney until you reach the hole level.

5- Slip through the hole a 45° or 30° liner elbow and connect it to the liner.

6- Add a small liner section to the liner elbow which will allow the liner to extend at least 12" (measured at the top of the liner) from the masonry chimney.

7- Seal the opening around the liner with high temperature refractory cement.

8- The next steps must be done in the following order :

A. Select the ASHT + length that will fit between the elbow and the liner so that it will slide at least 2" over the liner section. (You may need to cut the liner for a better fit).

B. Take that section and the BISUMA or BISPMA (BISUMA30 or MISPMA30) cover and slide it over the liner. Make sure you have enough opening to be able to install the ASHT+ elbow without difficulty.

C. Install the 45° or 30° elbow on the fireplace.

D. Slide the length section back down on the elbow and twist lock the two together.

E. Pull the cover down over the length and install the insulation pad over the liner; be careful to cover the liner completely.

F. Slide back the cover over the insulation and fix it in place using the 3 metal screws supplied.

PARTS AND COMPONENTS LIST (AC Chimney)

Description	Part No.
Lengths	**6" dia.**
12" length	AC 6L12
18" length	AC 6L18
36" length	AC 6L36
48" length	AC 6L48
15° elbow	AC 6E15
30° elbow	AC 6E30
Rain cap	AC 6CPR
Spark arrester cap	AC 6CPE
Supports	
Offset support	AC SO
Support section	AC 6SL
Roof support	AC ST
Starter section	AC 6SB
Roof brace	AC BS
Wall band	AC BM
Firestop	
Firestop	AC BF
Radiation shield	AC RS
Attic radiation shield	AC RSA
Wall radiation shield 30°	AC RSM30
Insulated wall radiation shield 30°	AC RSMI30
Wall radiation shield 45°	AC RSM45
Insulated wall radiation shield 45°	AC RSMI45
Outside air kit (chimney) (flex, insulation, outside register and coupling)	AC ZI
Flat roof flashing	ACF
Adjustable roof flashings	
1/12 - 7/12 (5° - 30°)	AC FA
8/12 - 12/12 (30° - 45°)	AC FB
12/12 - 21/12 (45° - 60°)	AC FBB
Peak roof flashings	
1/12 - 7/12 (5° - 30°)	AC FP
8/12 - 12/12 (30° - 45°)	AC FPB
Storm collar	AC FC

PARTS AND COMPONENTS LIST (Fireplace)

Description:	Part No.
Victorian arch shape door, gold plated 24K	BAG38
Contemporary arch shape door, gold plated 24K	BCG38
Victorian arch shape door, black	BAN38
Contemporary arch shape door, black	BCN38
Outside air kit	UZI

OPTIONS

Gravity kit:	Part No.:
Complete double ducting system including : 2 elbows 90°, 2 telescopic lengths, 2 grill supports and 2 black grills	7B30ZK
Complete single ducting system including :2 x 6" lengths, 1 decorative black frame and 1 black louver	7B30ZKS
Complete single ducting system including :2 x 6" lengths, 1 decorative brass frame and 1 brass louver	7B30ZKSB
Black grill with support	7B30ZO
Brass grill for 7B30ZK	7B30ZGB
Panel for clean face option	BISCF
1 brass louver & 1 decorative brass frame	7B26ZKSLB
Elbow 90°, 8" dia.	7B26ZE90
Elbow 45°, 8" dia.	7B26ZE45
Telescopic length, 8" dia.	7B26ZLA
Adjustable length 8" dia. (2" - 5")	7B26ZL2A
Radiation shield	7B26ZR
Central forced air kit:	
Central forced air kit including : flex 5" D.I. x 15 ft. long, adaptor and 2 clamps	BIS5FK10
Flex adaptor and 2 clamps	BISAF
Flexible pipe 5" D.I. x 30 ft. long	5FLEX25
Blower for central forced air kit and adaptor for decorative grill (BIS5FK8)	BISZY
Blower variable speed control with decorative wall plate for (BISZY)	VRUW
Thermo-disk, on/off blower control for (BISZY)	VTU
Decorative grill fan adaptor	BISAVG
Flexible pipe fan adaptor	BISAVF

OPTIONS (Fireplace):

Description:	Part No.
Cast-iron corner ornaments with magnets	APPC-01
Cast iron corner ornaments with magnets	APPCS-02
Cast-iron top ornament with magnet	APP-03
Panel for clean face option	BISCF
Rigid firescreen	BISZN-1
Heat activated on/off pre-wired fan kit	UZY3
Masonry chimney adaptor	BISUMA

APPENDIX

SPECIFICATIONS

Weight	412 lbs
Height	40 ½".
Width	38"
Depth	24 1/2"
Chimney weight ASHT+ (6" dia.) :	6.25 lb/ft.
Chimney weight S2100+ (6" dia.) :	10.8 lb/ft.

CLEARANCE TO COMBUSTIBLES

The following clearances meet the minimum requirements for a safe installation

Side wall:	24" (457 mm) measured from the door edge
Ceiling:	6' 8" (2032 mm) measured from the base of the fireplace
Fireplace enclosure:	Bottom: 0 Side: 0 Back: 0 Top: Do not fill the space above the fireplace with any material
Chimney:	2" (50 mm)
Mantel:	48" (1219 mm) measured from the base of the fireplace

REPLACEMENT PARTS

Rear baffle refractory		PR-SR1965
Front baffle refractory		PR-SR1968
Back refractory		PR-SR1972
Right side refractory		PR-SR1971D
Left side refractory		PR-SR1971G
Bottom refractory		PR-SR1973
Wooden handle		PR-SR1787
Ceramic glass panel :		
(Victorian door)	- right	PR-SR1788D
	- left	PR-SR1788G
(Contemporary door)	- right	PR-SR1818D
	- left	PR-SR1818G
1st Secondary air tube (rear)		PR-SR1995
2nd Secondary air tube (middle)		PR-SR1994a
3rd Secondary air tube (middle)		PR-SR1994b
4th Secondary air tube (middle)		PR-SR1994c
5th Secondary air tube (front)		PR-SR1979
Cast-iron log supports (2)		7B30B2CH
Cast-iron center support (1)		PR-SR1982

APPENDIX G
Unit Pre-Burn Documentation

ITS Intertek Testing Services

Date: 2001-11-08

Manufacturer: CHEMINÉES SÉCURITÉ Model: BIS VISTA

WHI LTO#: 3008830 Run:_____ Tech: CLAUDE PARÉ

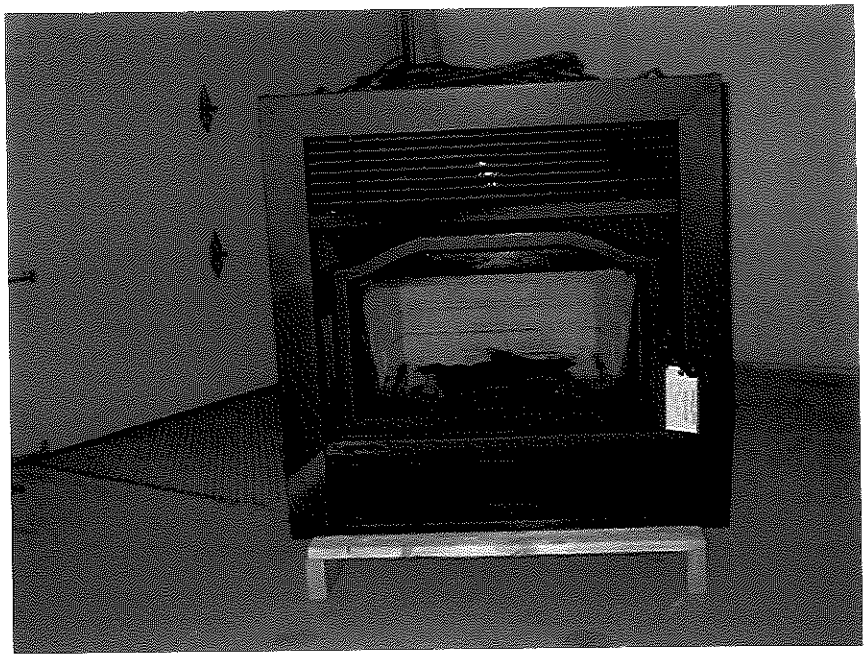
Break-in Data log

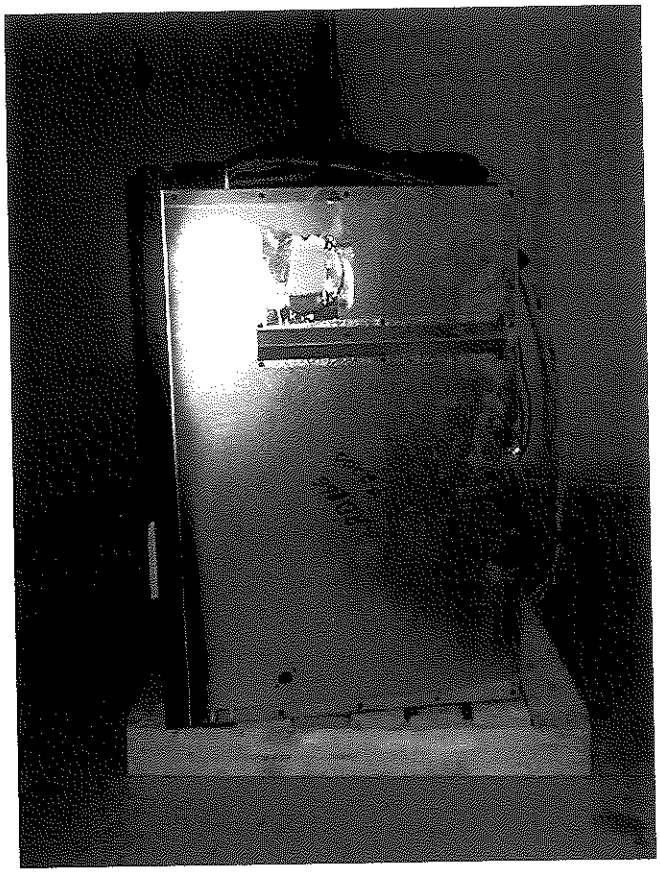
Type of fuel used: SPRUCE AND MAPLE
Moisture content corrected to 2-pin and for the type of fuel used.

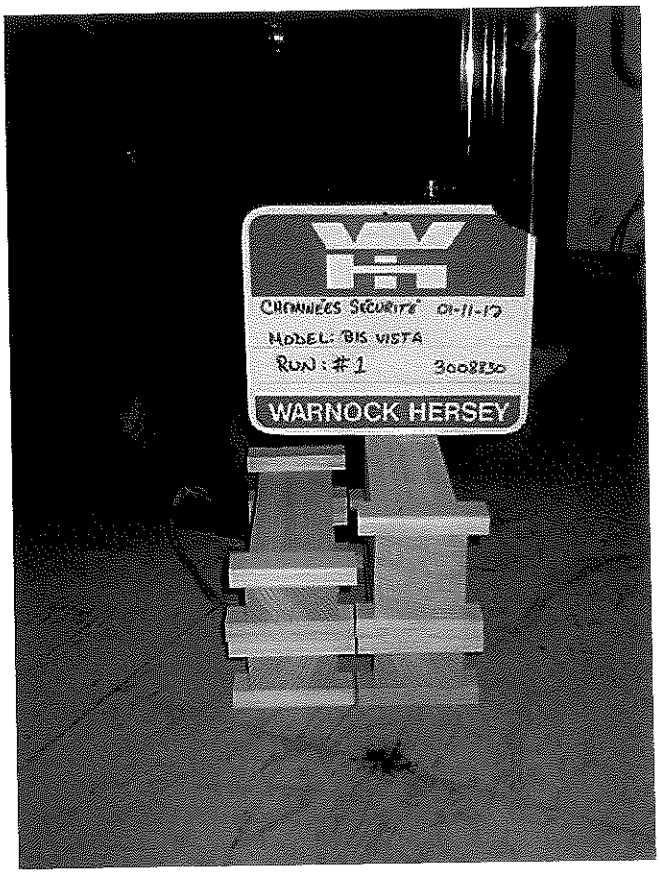
Catalytic_____ Non-catalytic ✓

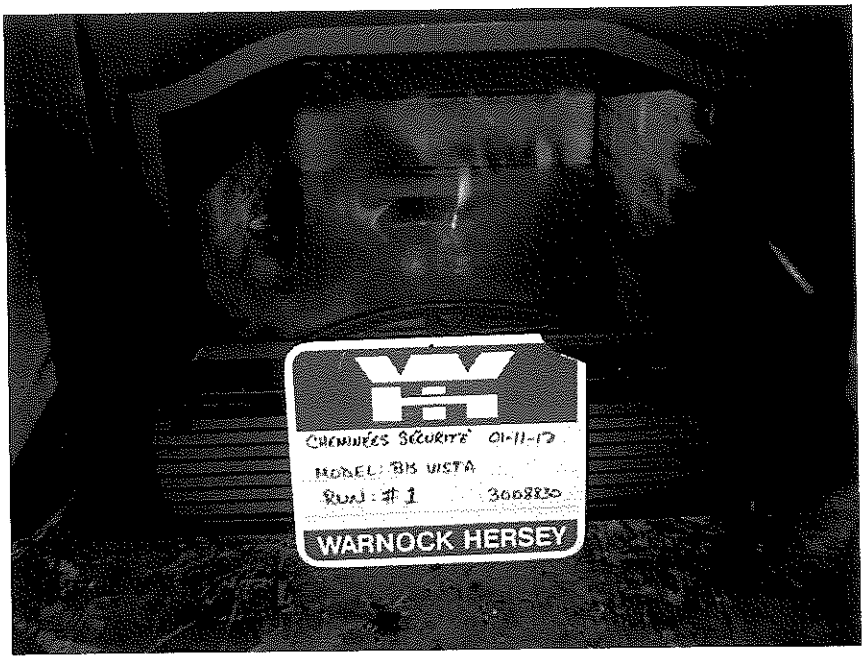
Date	Time	Flue Temp	~~Comb. chamb.~~ TEST FUEL SCALE READING ~~or Catalyst temp~~	lbs. Fuel weight added	Moisture content
2001-11-08	6h45	417	15.35	15.05	19.0%
2001-11-08	7h45	413	2.90	—	—
2001-11-08	8h00	410	13.05	10.70	19.4%
2001-11-08	8h45	425	5.20	—	—
2001-11-08	9h45	350	3.70	—	—
2001-11-08	10h45	285	2.95	—	—
2001-11-08	11h14	267	15.30	12.65	21.2%
2001-11-08	11h45	577	10.65	—	—
2001-11-08	12h45	372	4.65	—	—
2001-11-08	13h45	315	3.70	—	—
2001-11-08	14h45	301	2.75	—	—
2001-11-08	15h45	252	2.05	—	—
2001-11-08	16h45	220	1.55	—	—

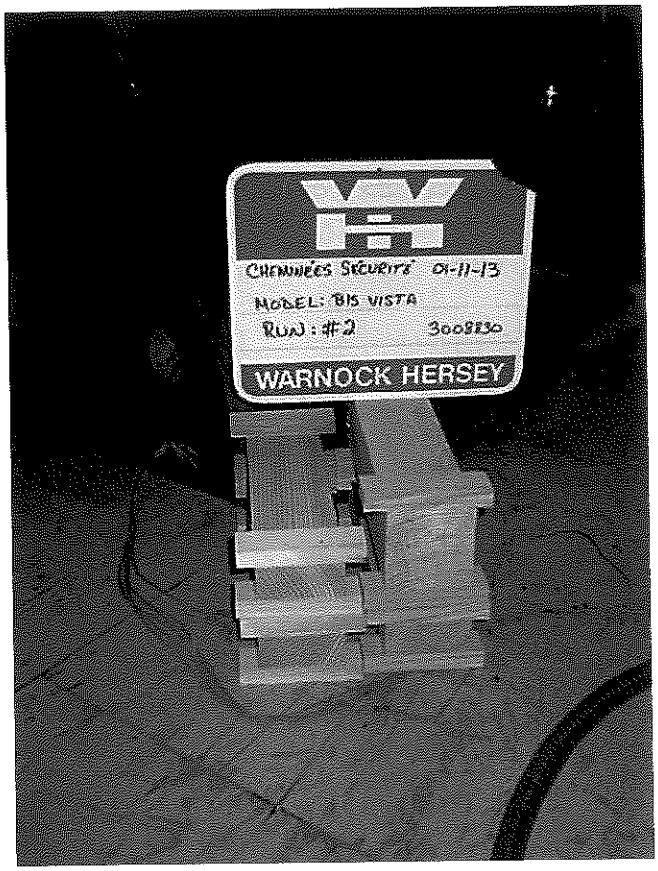
APPENDIX H
Photographs

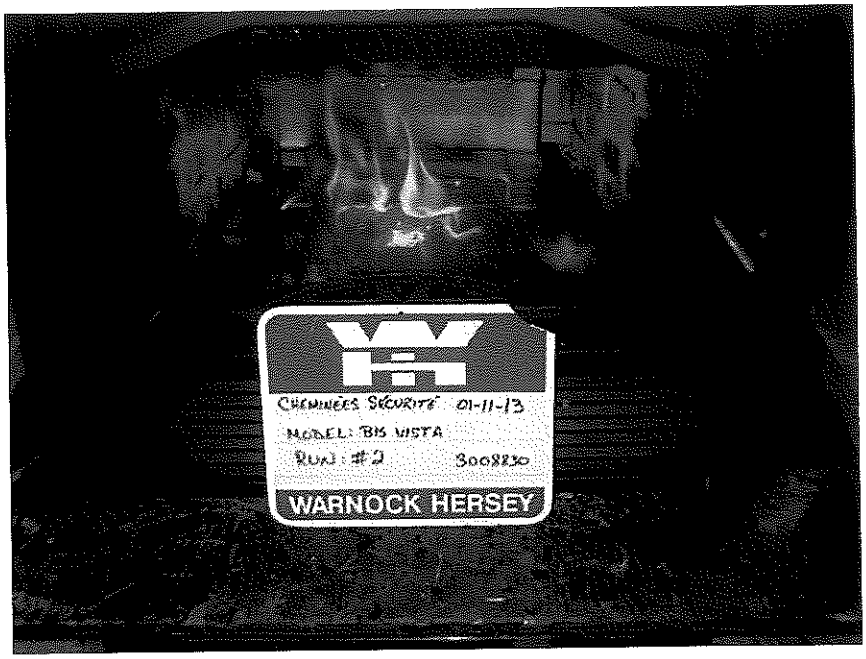





CHROMEOS SECURITY 01-11-12
MODEL: BIS VISTA
RUN: #1 3008230
WARNOCK HERSEY

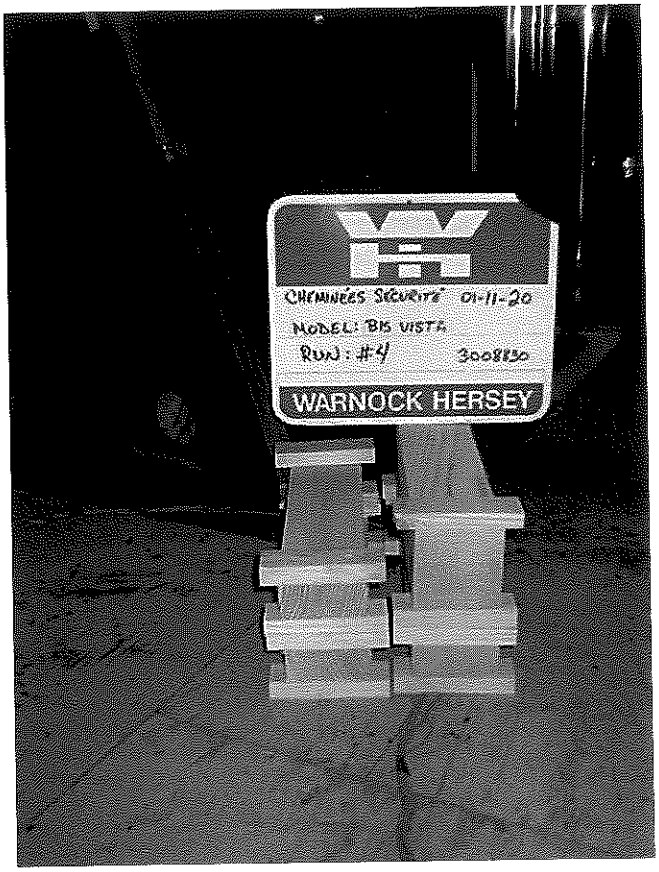

CHEMINÉES SÉCURITÉ 01-11-17
MODEL: BIS VISTA
RUN: #1 3008830
WARNOCK HERSEY

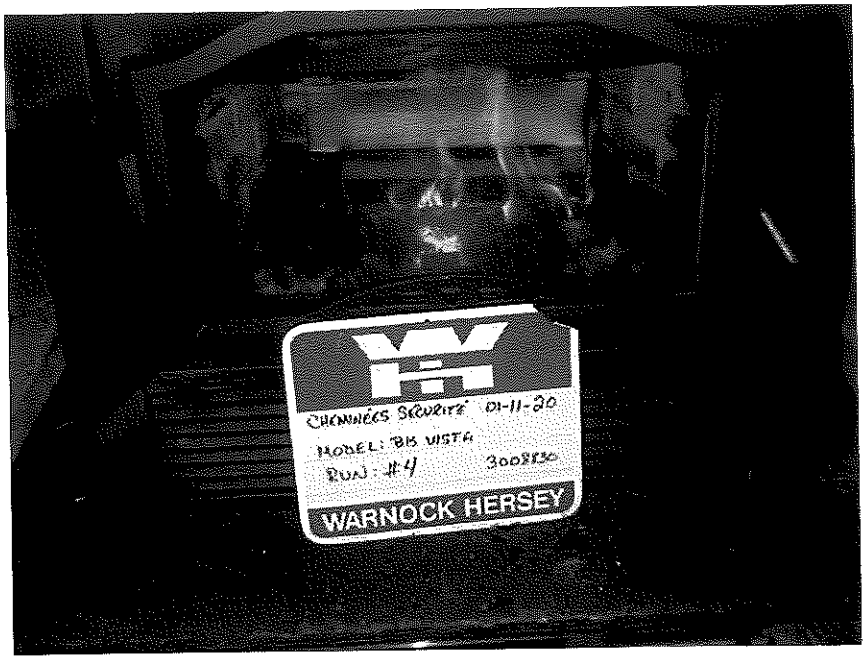

CHENNEVIÈRES SECURITE 01-11-13
MODEL: BIS VISTA
RUN: #2
3008830
WARNOCK HERSEY

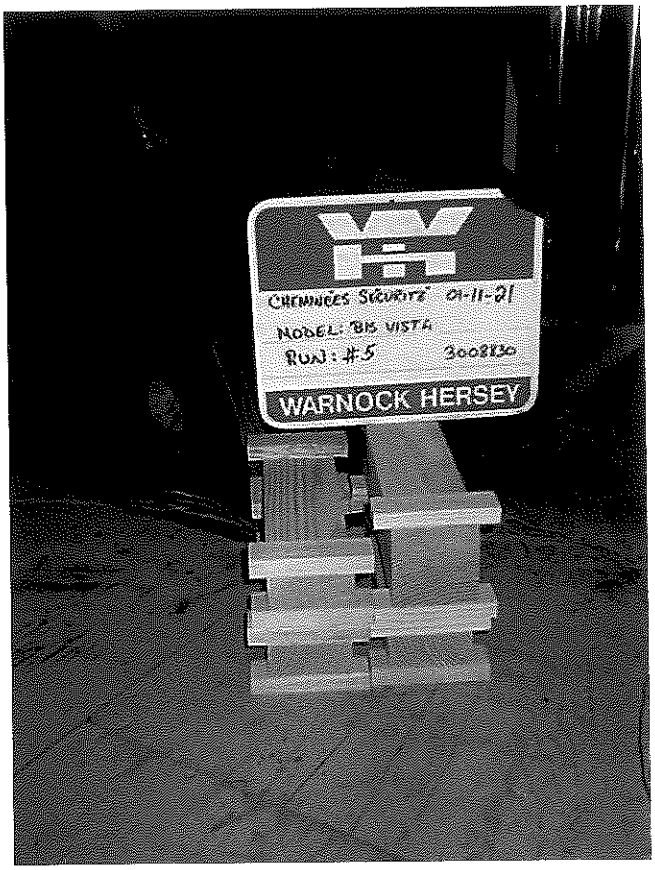

CHEMINÉES SÉCURITÉ 01-11-13
MODEL: BIS VISTA
RUN: #2 3008230
WARNOCK HERSEY

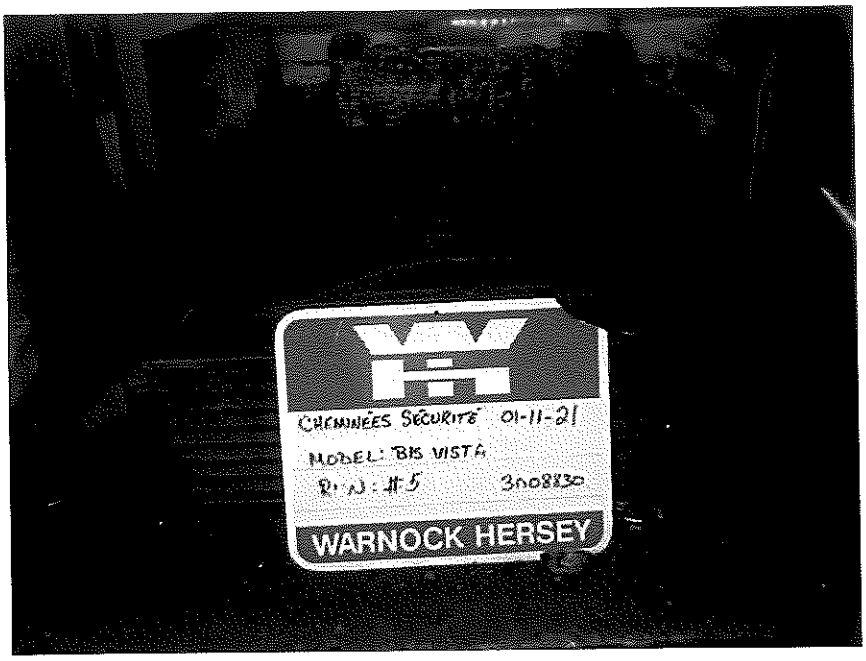

CHENNEES SECURITE 01-11-14
MODEL: BIS VISTA
RUN: #3
WARNOCK HERSEY

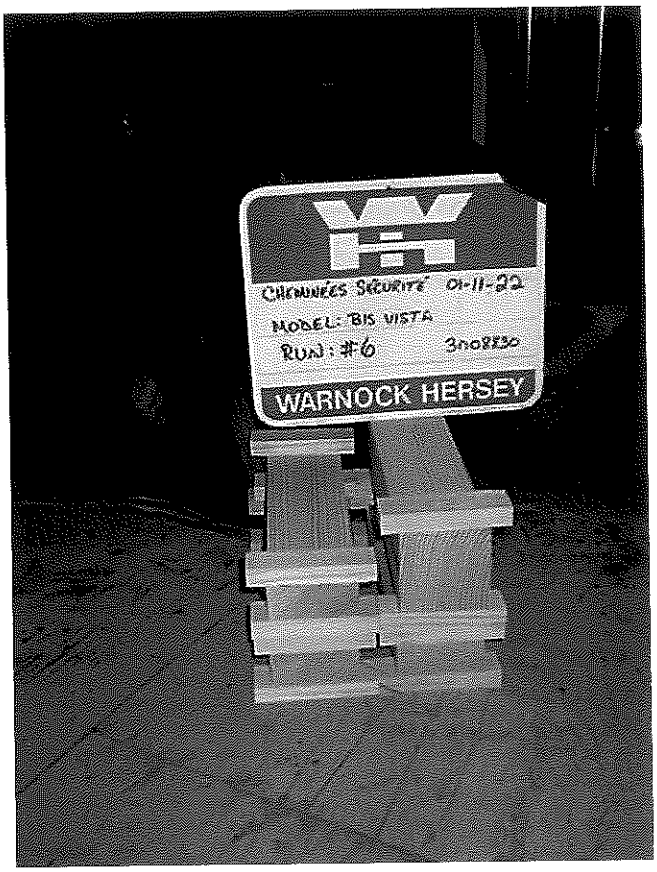

CHEMINÉES SÉCURITÉ 01-11-14
MODEL: BIS VISTA
RUN: #3 3008330
WARNOCK HERSEY


CHEMINÉES SÉCURITÉ 01-11-20
MODEL: BIS VISTA
RUN: #4
3008130
WARNOCK HERSEY

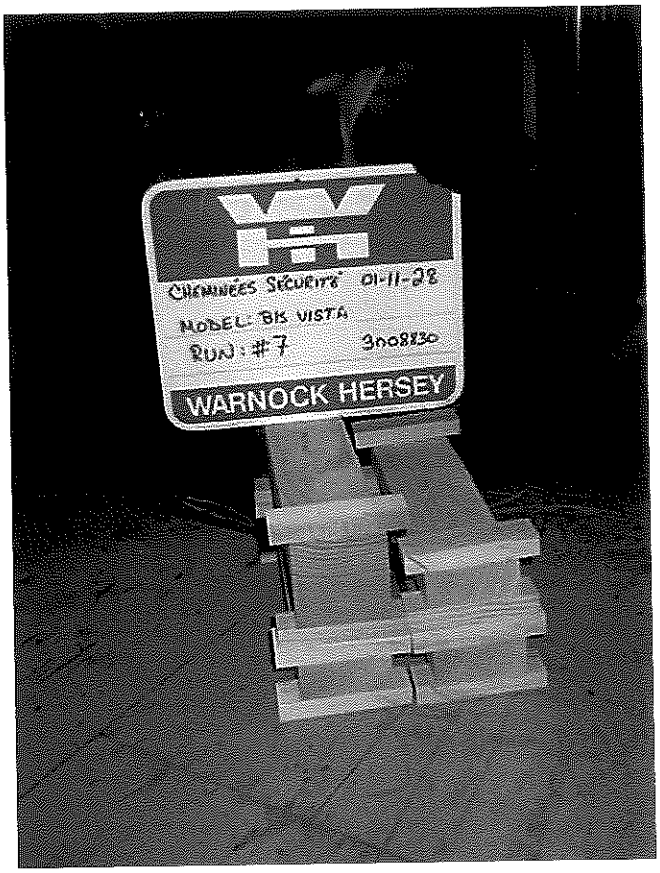

CHANNÉES SÉCURITÉ 01-11-20
MODEL: BIS VISTA
RUN: #4
3008530
WARNOCK HERSEY

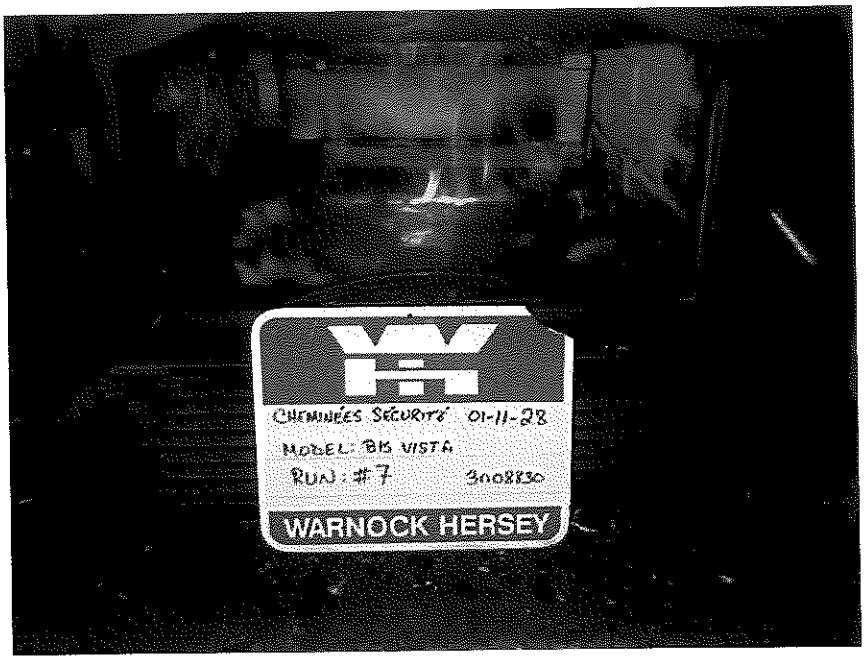

CHEMINÉES SECURITÉ 01-11-21
MODEL: BIS VISTA
RUN: #5
3008130
WARNOCK HERSEY

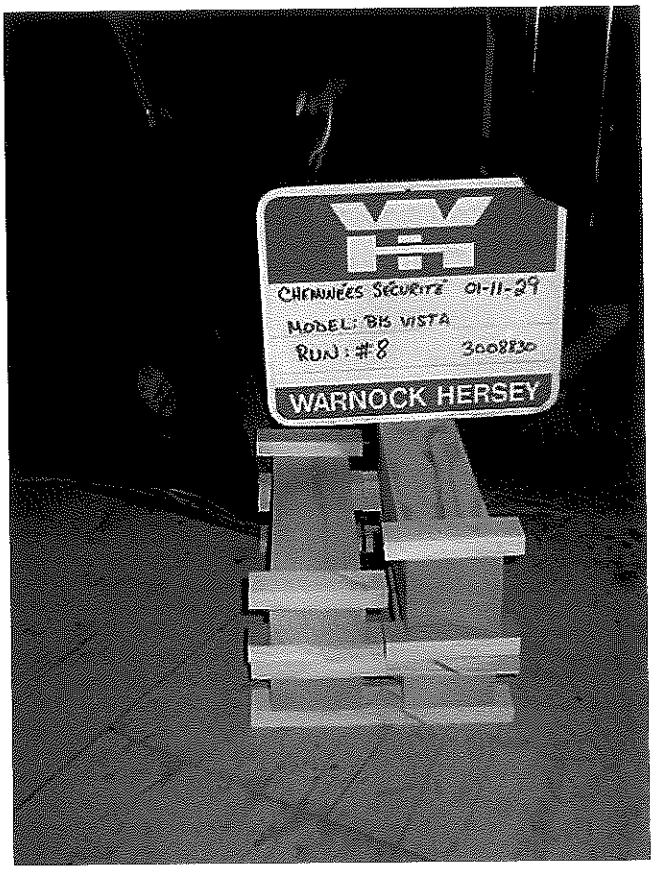

CHEMINÉES SÉCURITÉ 01-11-21
MODEL: BIS VISTA
P.N.: #5
3008830
WARNOCK HERSEY

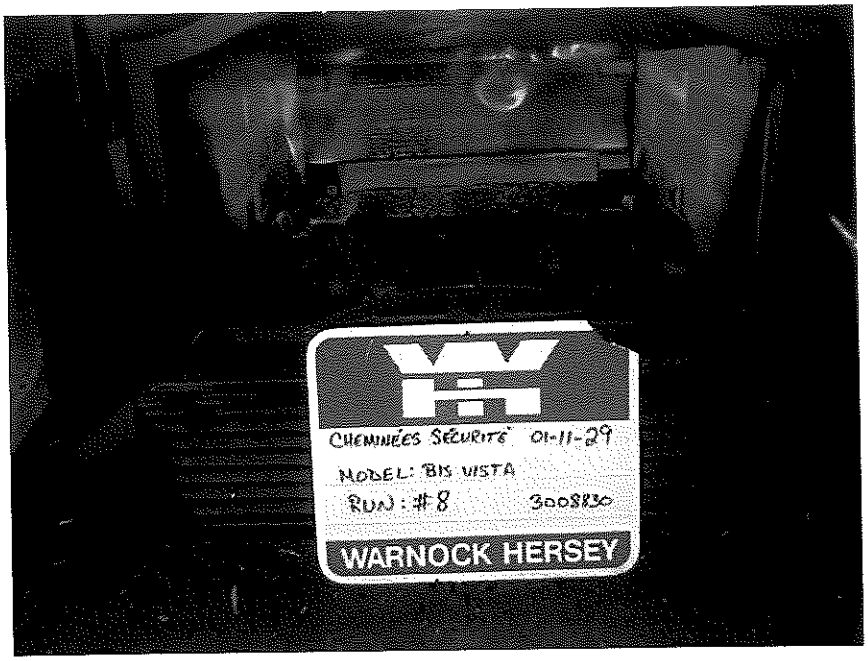

CHEMINÉES SÉCURITÉ 01-11-22
MODEL: BIS VISTA
RUN: #6 3108830
WARNOCK HERSEY


CHEMINÉES SÉCURITÉ 01-11-22
MODEL: BB VISTA
RUN: #6
WARNOCK HERSEY

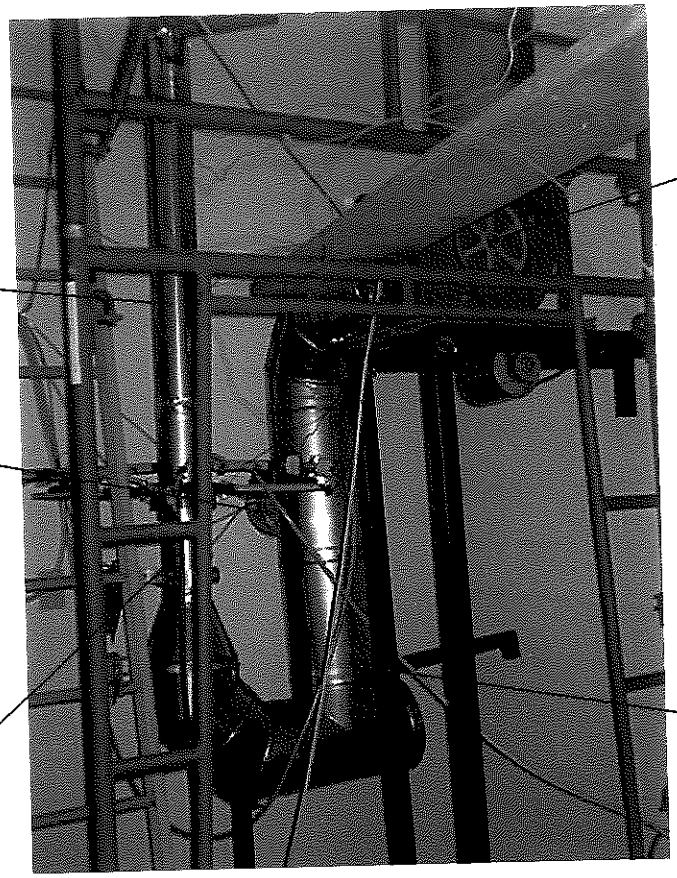

CHEMINÉES SÉCURITÉ 01-11-28
MODEL: BK VISTA
RUN: #7
WARNOCK HERSEY


CHEMINÉES SÉCURITÉ 01-11-28
MODEL: BIS VISTA
RUN: #7 3008830
WARNOCK HERSEY


CHEMINÉES SÉCURITÉ 01-11-29
MODEL: BIS VISTA
RUN: #8 300830
WARNOCK HERSEY


CHEMINÉES SÉCURITÉ 01-11-29
MODEL: BIS VISTA
RUN: #8 300830
WARNOCK HERSEY

APPENDIX I
Drawings of stack gas sampling train and dilution tunnel system



Exhaust blower

6 in. dia. Stainless steel pipe

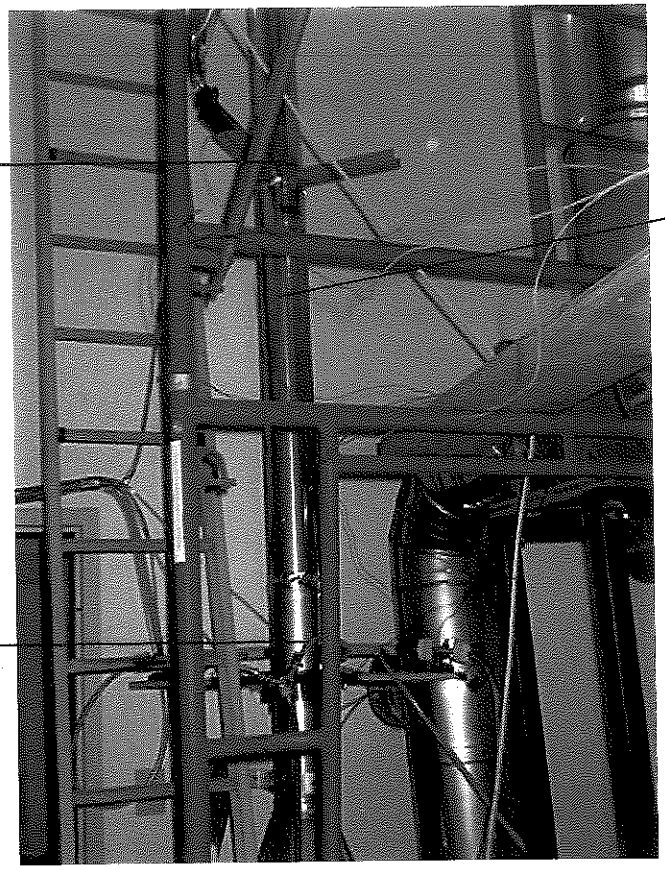
Air intake with damper to adjust flow rate

16 in. between sampling probe and lower elbow

12 in. dia. Stainless steel pipe

Velocity port

10 feet long dilution tunnel

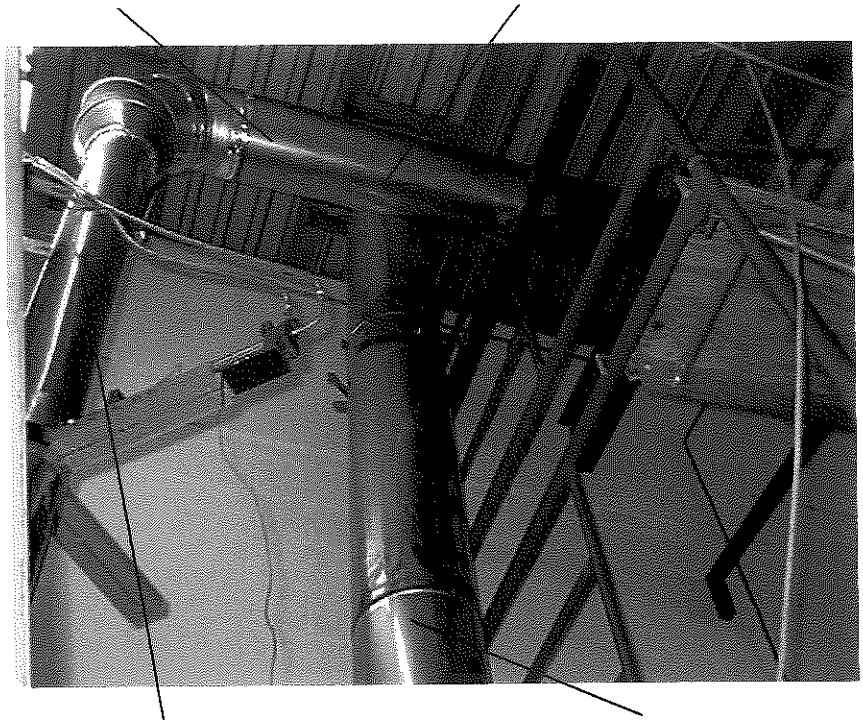


49 inches

Sampling port, 2 sampling probes with 2 in. dia. Filter each. Filter used: Gelman 61631

12 in. dia. Stainless steel pipe

Mixing baffle (2) location; 1 foot between baffles

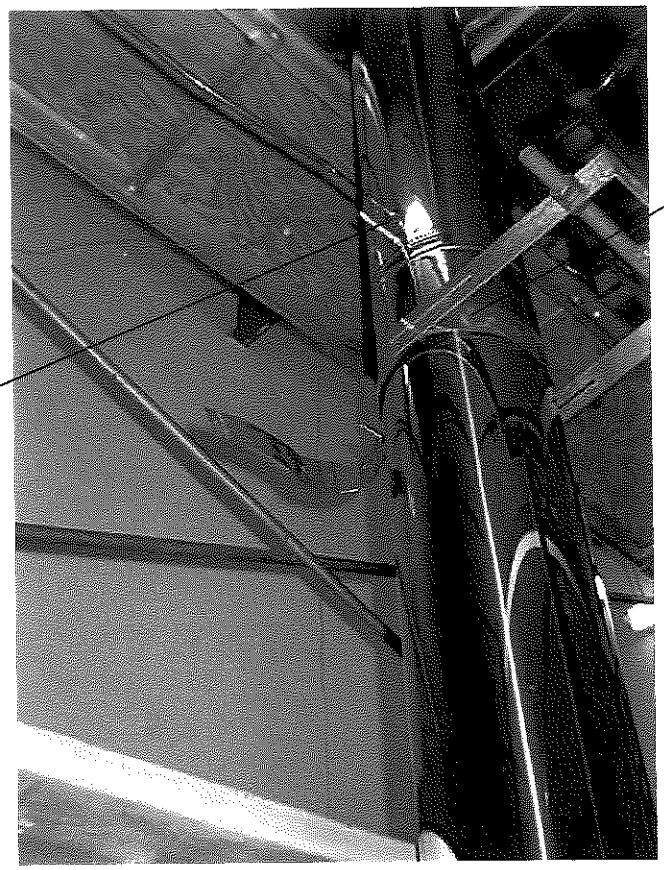


4 feet long between velocity port and upper elbow

12 in. dia. Stainless steel pipe

44 in. dia. Stainless steel smoke capture hood, located 10 feet away from dilution tunnel





Exhaust system support bracket

Temperature and gas analyser sampling ports located 9 feet above atform



Draft sampling port located 6 in. from flue outlet