



# Florida Department of Environmental Protection

Bob Martinez Center  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Charlie Crist  
Governor

Jeff Kottkamp  
Lt. Governor

Michael W. Sole  
Secretary

October 24, 2007

Mr. John Stiefel  
Stiefel Aluminum, Incorporated  
14920 Citrus Country Drive  
Dade City, Florida 33523

Re: Facility No.: 1010497-002

Dear Mr. Stiefel:

The Department has received the General Permit Notification Form for the secondary aluminum sweat furnace facility that you submitted on September 17, 2007.

As you know, pursuant to Florida Statutes section 403.814(1), authority to operate under general permits commences thirty days after receipt of the notification form unless you have been notified by this office that your facility has not shown entitlement to operate pursuant to the rule provisions.

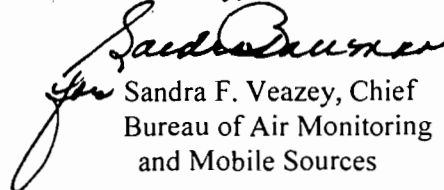
For your information, authority to operate pursuant to Rule 62-210.310 expires after 5 years. Therefore, a new registration form must be received no later than 5 years after the date your notice was received as indicated above. If your general permit rule conditions require testing, such testing must be completed within the time frame specified in the rule.

If you have or expect to have any changes in your mailing address, location address, responsible official, or phone number, please notify the Department at the following address:

General Permits Office  
Bureau of Air Monitoring and Mobile Sources MS 5510  
Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

If there are any changes in the facility status, including change of operating parameters or equipment, or if you have any additional questions regarding the General Permit Program, please contact the district or local air program compliance inspector in your area.

Sincerely,

  
Sandra F. Veazey, Chief  
Bureau of Air Monitoring  
and Mobile Sources

SFV/pg

cc: Mr. Christopher Bradley, Southwest District

NO ACTIVITY FOR FACILITY .....  
EMISSION FEE DATES *2004-2006* .....  
*ICS* ~~SOE~~ REPORTS.....  
COMPLIANCE STATUS .....

*INSP-ICS - Full Compliance  
Evaluation site - 4/3/2007 -  
INSP-SWD - Pasco Co - CB*

**STIEFEL ALUMINUM, INC.**  
**14920 Citrus Country Drive**  
**Dade City, FL 523**  
**Voice (813) 951-2631 Fax (813) 907-8523**

September 13, 2007

**Certified mail Return Receipt Requested**

General Permits Section  
Bureau of Air Monitoring and Mobile Sources, MS 5510  
Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

Re.: Air General Permit Registration for A Secondary Aluminum Sweat furnace.

Dear Sirs:

Stiefel Aluminum, Inc. is proposing to modify the existing/registered aluminum sweat furnace at its facility in Dade City, Pasco County to use dual fuel natural gas or No. 2 fuel oil. A notification for registration and relocation was filed with your office to relocate this sweat furnace from 4336 Knight-Station Road, Lakeland, Polk County to the present location on May 14, 2005. The modification will commence upon receipt of approval from the Florida Department of Environmental Protection. .

As stated before, this sweat furnace is equipped with an afterburner that meets the design criteria and operation required by 40 CFR 63.1505(f)(1) and 63.1506(h). This Secondary Aluminum Processing Unit (SAPU) is the only emission unit, thus our facility is an area source.

Stiefel Aluminum, Inc. keeps the following:

- An afterburner temperature monitoring device and temperature data records.
- A written operation, maintenance, and monitoring (OM&M) plan, this plan is maintained on-site.
- A written startup, shutdown and malfunction plan, this plan is maintained on-site.

Should there be a need for additional information, please let us know.

Respectfully submitted,

  
John L. Stiefel II, President

Cc.: Ike Habib, P.E. HB Engineering, Inc.

G:\Dade City Coverletter GP1.doc



**Facility Description and Comments**

Number of secondary aluminum sweat furnace units on site: 1

Is each secondary aluminum sweat furnace equipped with an afterburner that has a design residence time of at least 0.8 seconds and a design operating temperature of at least 1600 degrees Fahrenheit, and is the manufacturer's documentation of these design specifications maintained on-site?  Y  N (circle one)

If 'No,' explain \_\_\_\_\_

Does each secondary aluminum sweat furnace have an afterburner temperature monitoring device and temperature data recorder?  Y  N (circle one)

If 'No,' explain \_\_\_\_\_

Does each secondary aluminum sweat furnace have a written operation, maintenance, and monitoring (OM&M) plan, and is this plan maintained on-site?  Y  N (circle one)

If 'No,' explain \_\_\_\_\_

Does each secondary aluminum sweat furnace have a written startup, shutdown and malfunction plan, and is this plan maintained on-site?  Y  N (circle one)

If 'No,' explain \_\_\_\_\_

List and briefly describe all other process operations at the site that may emit air pollutants (for example, scrap shredders, degreasers, paint shops, boilers, emergency generators, etc.). Add any comments about the facility that would be helpful to the Department in understanding the nature of your operation (for example, describe the products made, amount of materials used, air pollution control equipment employed, and hours of operation).

The sweat furnace will use substantially clean charge and post consumer aluminum wheels for production of high-grade aluminum alloys, equipped with three (3) dual fuel: natural gas and oil burners with total heat input of 1.5 MMBTH using either natural gas or No. 2 oil. Afterburner will be used to meet FAC 62-213.300 (a, (b) & (f) and 40 CFR Part 63.1505(f)(1) - with a design residence time of at least 0.8 seconds and a design operating temperature of at least 1600 degrees Fahrenheit. High quality iron scrap and ingots will be charged with no flux used. Products will be sold to the die cast industry.

**Emission Calculations:**

**1. Use of No. 2 Oil for Combustion**

Basis Furnace Operation: 12 hrs/day, 5 days/wk & 52 wk/yr.

Maximum volume of Oil needed by furnace & afterburner =  $\frac{1,500,000}{138,000} + 11.5 = 22.4 \text{ gallons / hr}$  use 23.0 gph

No. 2 Oil S% < 0.35%

**a. Total PM from No.2 Oil Combustion @ 2 lb/10<sup>3</sup> gal & AP-42 Emission Factor of 1.9 lbs/ton of Metal Processed**

Total PM consists of MP and PM-10. According to AP-42, the particle size distribution for uncontrolled PM emissions is 60% PM-10 and 40% PM.

$$\text{PM Emissions} = \frac{23.0 \times 2.0}{1000} + \frac{1.9 \times 800}{2000} = 0.8 \text{ lbs / hr}$$

$$\text{Total PM Annual Emissions} = 0.8 \times 12 \times 5 \times 52 / 2000 = 1.25 \text{ TPY}$$

$$\text{PM}_{10} = 0.6 \times 1.25 = 0.75 \text{ TPY}$$

b. Sulfur Dioxide from No. 2 Oil Combustion Emission Factor AP-42 = 142S/1000 gal\*

$$\text{Uncontrolled Sulfur Dioxide Emissions} = \frac{23.0 \times 142 \times 0.35}{1000} + \frac{0.9 \times 800}{2000} = 1.40 \text{ lbs / hr}$$

$$\text{Annual Sulfur Dioxide Emissions} = 12 \times 5 \times 52 \times 1.4 / 2000 = 2.18 \text{ TPY}$$

c. Nitrogen Oxides From No. 2 Oil Combustion & AP-42 Emission Factor of 0.76 lbs/ton of Metal Produced

$$\text{Nitrogen Oxides Emission Factor} = 20 / 1000 \text{ gal*}$$

$$\text{Nitrogen Oxides Emissions} = \frac{23.0 \times 20}{1000} + \frac{0.76 \times 800}{2000} = 0.76 \text{ lbs / hr}$$

$$\text{Annual Nitrogen Dioxide Emissions} = 12 \times 5 \times 52 \times 0.76 / 2000 = 1.18 \text{ TPY}$$

d. Carbon Monoxide From No. 2 Oil Combustion

$$\text{Carbon Monoxide Emission Factor} = 5 / 1000 \text{ gal*}$$

$$\text{Carbon Monoxide Emissions} = \frac{23 \times 5}{1000} = 0.11 \text{ lbs / hr}$$

$$\text{Emissions Potential PTE} = 12 \times 5 \times 52 \times 0.11 / 2000 = 0.18 \text{ TPY}$$

\*AP-42 Emission Factor for Distillate Oil

Emissions of Volatile Organic Compounds (VOC) – AP Emission Factor of 0.2 lbs/ton of Metal Produced

VOC Emissions will be destroyed by the afterburner at > 99% Emissions are negligible

**Summary Table Combustion of No. 2 Oil**

Pollutant	Lbs/hr	TPY
Total PM	0.8	1.25
Sulfur Dioxide	1.4	2.18
Nitrogen Oxides	0.76	1.18
Carbon Monoxide	0.11	0.18

**2. Use of Natural Gas for Combustion**

Basis Furnace Operation: 12 hrs/day, 5 days/wk & 52 wk/yr.

Maximum heat input = 23.0 *gph* x 138,000 = 3.17 *MMBTH*

Annual Natural Gas Consumption = 3.17 x 1000,000 x 12 x 5 x 52/1059 = 9,351,161 cubic feet per year

**a. Total PM from Natural Gas Combustion @ 7.6 lb/10<sup>6</sup>\* & AP-42 Emission Factor of 1.9 lbs/ton of Metal Processed**

Total PM consists of MP and PM-10. According to AP-42, the particle size distribution for uncontrolled PM emissions is 60% PM-10 and 40% PM.

Annual PM Emissions = (9.32x7.6 + (1.8 x800/2000) x 12 x5 x52)/2000 = 1.2 *TPY*

Hourly emissions rate = 1.2 x 2000/3120 = 0.74 lbs/hr

PM10 = 0.6 x 1.2 = 0.72 *TPY*

**b. Sulfur Dioxide Emission Factor for Natural Gas AP-42 = 0.6/10<sup>6</sup>ft<sup>3</sup>\*and 0.9 lbs/ton of Metal Processed**

Annual Sulfur Dioxide Emissions = (9.352x 0.6 + (0.9x800/2000) x 12 x 5 x 52)/2000 = 0.57 *TPY*

Hourly emissions rate = 0.57 x 2000/3120 = 0.36 lbs/hr

**c. Nitrogen Oxides From Natural Gas Combustion 50 lbs/10<sup>6</sup>ft<sup>3</sup>\* & AP-42 Emission Factor of 0.76 lbs/ton of Metal Produced**

Annual Nitrogen Dioxide Emissions = (9.352x50+ (0.76 x 800/2000) x 12 x 5 x 52 x 2000 = 0.71 *TPY*

Hourly emissions rate = 0.71x 2000/3120 = 0.45 lbs/hr

**d. Carbon Monoxide From Natural Gas Combustion 84 lbs/10<sup>6</sup>ft<sup>3</sup>**

Carbon Monoxide Emissions = 9.352 x 84/2000 = 0.39 *TPY*

Hourly emissions rate = 0.39 x 2000/3120 = 0.25 lbs/hr

\* AP-42, Table 1.4-1 & 2

**Summary Table Combustion of natural Gas**

Pollutant	Lbs/hr	TPY
Total PM	0.74	1.2
Sulfur Dioxide	0.36	0.57
Nitrogen Oxides	0.45	0.71
Carbon Monoxide	0.25	0.39





Stiefel Aluminum, Inc.

**Sweat Furnace Afterburner Retention Time****RESIDENCE TIME DETERMINATION FOR NATURAL GAS**

Basis:

**Sweat Furnace and afterburner at 3.17 MMBTH, natural gas at gross heat of 1059 BTU/ft<sup>3</sup>**Flue gases from natural gas combustion of 1 ft<sup>3</sup> are 11.06 scf.Total volume of flue gases =  $(3.17 \times 10^6 / 1059) \times 11.06 / 60 = 551.8$  scfm

By comparing the flue gases from #2 oil combustion of 570 scfm with the flue gases from natural gas combustion of 552 scfm there is no significant change.

Estimated infiltrated air volume at charge door = 400 scfm

Scenario No.1 – Melting: Charge Door Closed

Operation during melting: The charge door remains closed, exhaust gas volume to incinerator will contain vapors from scrap and will have less infiltrated air

Estimated exhaust volume =  $552 + 200 + 200 = 952$  scfmFlue gases from sweat furnace will be at high temperature, afterburner burner will modulate down to maintain 1600<sup>o</sup>F.Scenario No.2 – Charging: Charge Door Open

Operation during charging

The sweat furnace main burners will operate on low fire when the charge door is opened, exhaust gas volume to incinerator will have less products of combustion, but will pickup more fumes, vapors and infiltrated air.

Estimated gas consumption =  $1.5 \times 0.4 + 1.5 = 2.1$  MMBTHEstimated exhaust volume =  $(2.1/3.17) \times 552 + 200 + 400 = 366 + 100 + 400 = 866$  scfmFlue gases from sweat furnace will be at low temperature, afterburner burner will modulate up to maintain 1600<sup>o</sup>F.Worst-case scenario is 970 scfm at 900<sup>o</sup>F. Use 1000 scfm at 900<sup>o</sup>F.Air Enthalpy @ 900<sup>o</sup>F = 6,227 Btu/lb molAir Enthalpy @ 1600<sup>o</sup>F = 11,500 Btu/lb molAvailable Heat of natural gas @ 1600<sup>o</sup>F = 600 Btu/ft<sup>3</sup>**Heat Balance – Heat Requirements**

$$\Delta H = \left( \frac{1000}{379} \right) \times (11,500 - 6,227) = 13,913 \text{ BTU / min}$$

$$\Delta H \text{ plus heat loss } 10\% = 13,913 \times 1.1 \times 60 = 919,000 \text{ BTU/hr Or } 0.92 \text{ mmBTH}$$

$$\text{Volume of natural gas needed} = 920,000/600 = 1,533 \text{ ft}^3/\text{hr.}$$

Exhaust Volume Determination:

$$1,000 \text{ scfm} \times (1600+460)/(70+460) = 3,887 \text{ scfm or}$$

$$v = 3,887/60 = 65 \text{ acfs}$$

Stiefel Aluminum, Inc.

**Sweat Furnace Afterburner Retention Time**

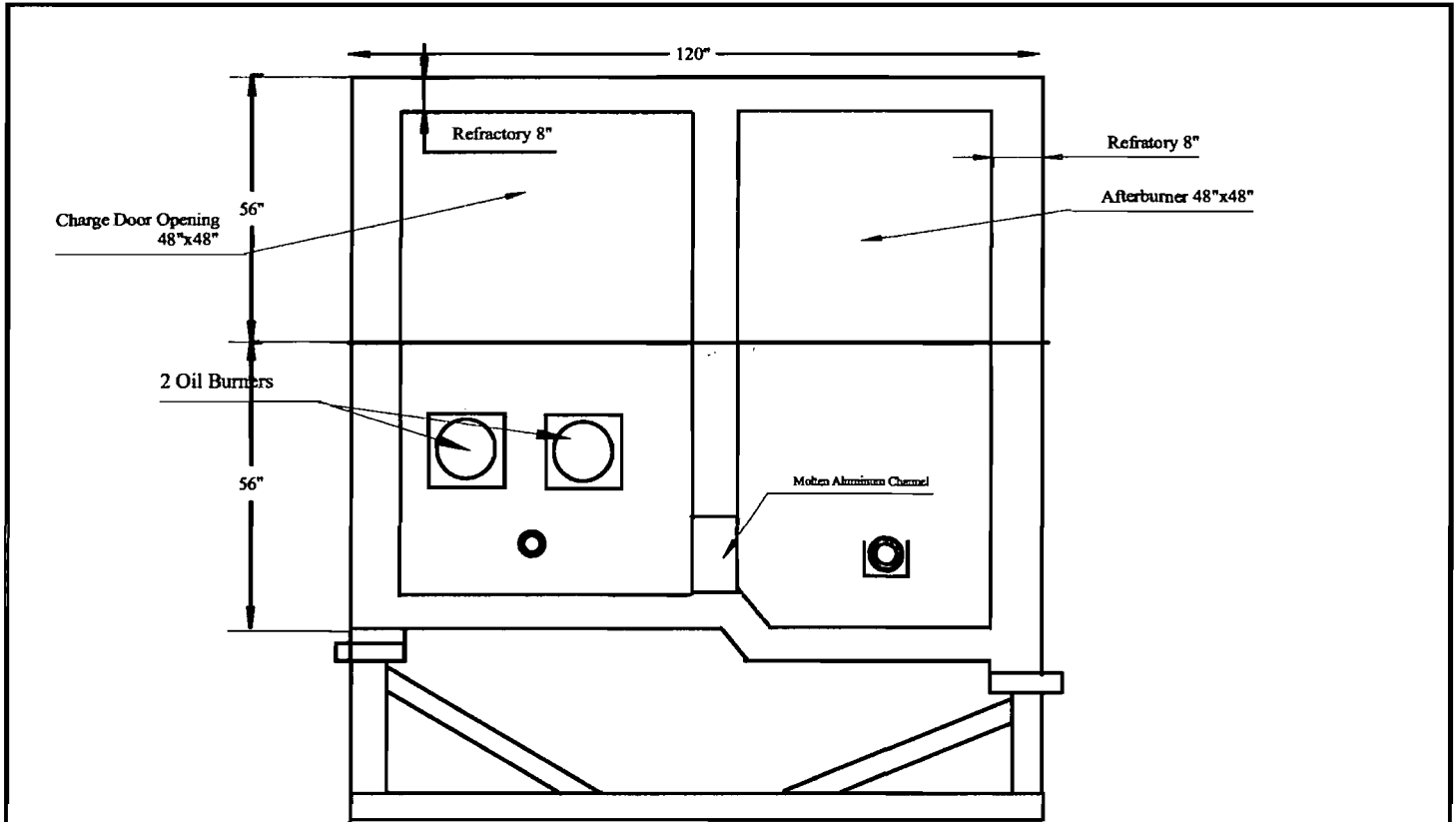
$$V = \pi/4 \times d^2 \times L \quad \text{Retention Time } t = V/v$$


Where: Chamber Volume = V L x H = 4' x 4' L = length = 5.75'

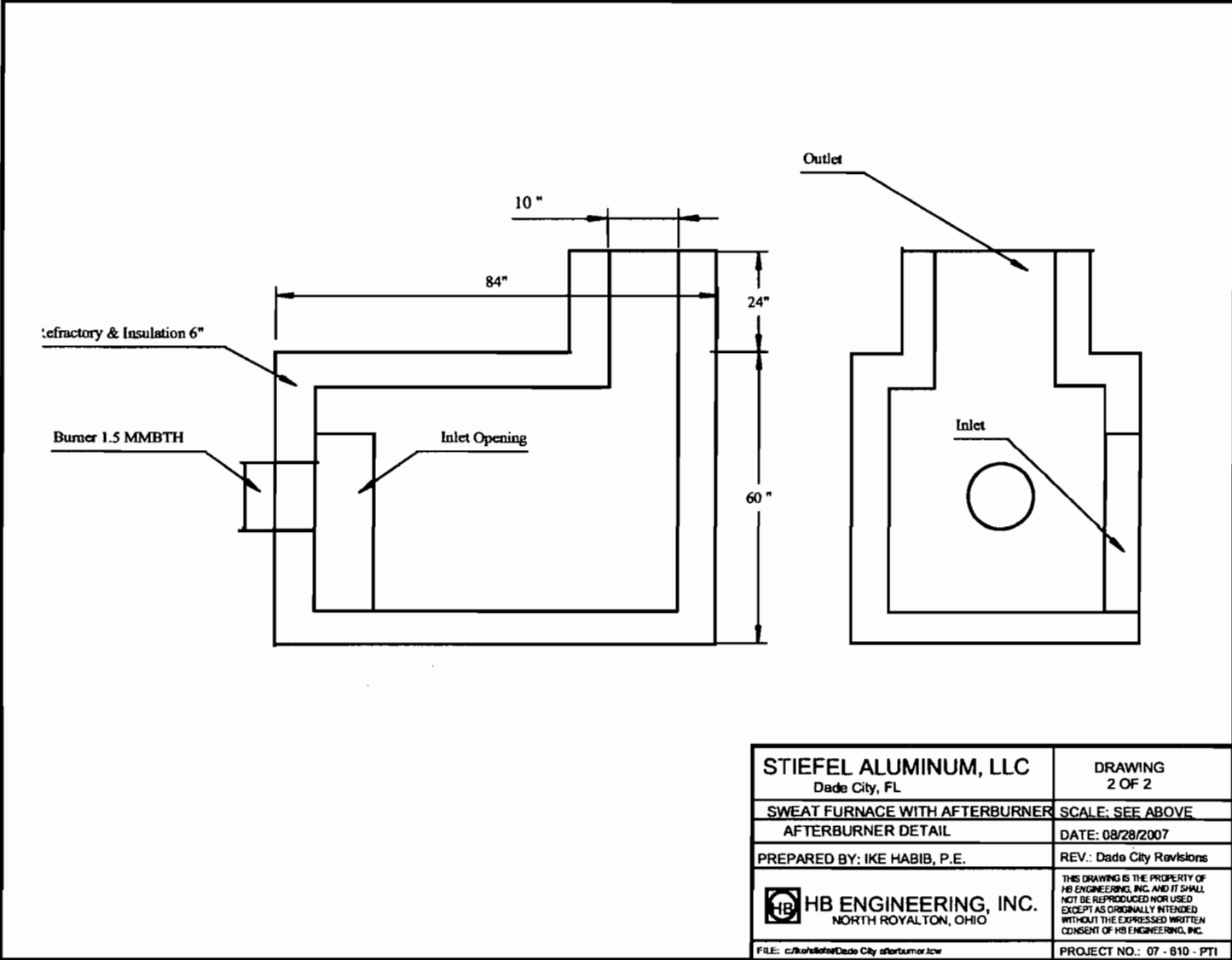
$$V = 4 \times 4 \times 5.75 = 92 \text{ ft}^3$$


$$t = 92 \text{ ft}^3 / 65 \text{ acfs} = 1.41 \text{ seconds}$$

The indicated volume of natural gas is the maximum needed if the operating scenario prevails during one-hour, in reality the charging will be for a short period every hour. During the melting, the exhaust volume will decrease and temperature will increase, thus the fuel consumption by the afterburner will be less than shown.

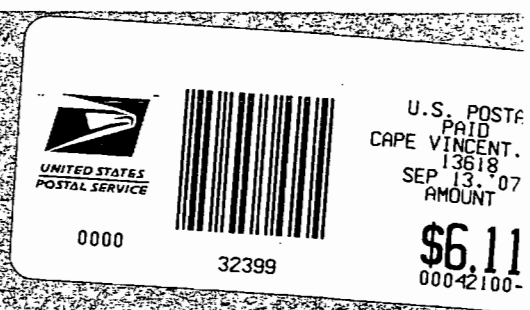


STIEFEL ALUMINUM, LLC		DRAWING	
Dade City, FL		1 OF 2	
SWEAT FURNACE WITH AFTERBURNER		SCALE: SEE ABOVE	
SWEAT FURNACE DETAIL		DATE: 08/28/2007	
PREPARED BY: IKE HABIB, P.E.		REV.: Dade City Revisions	
 <b>HB ENGINEERING, INC.</b> NORTH ROYALTON, OHIO		THIS DRAWING IS THE PROPERTY OF HB ENGINEERING, INC. AND IT SHALL NOT BE REPRODUCED NOR USED EXCEPT AS ORIGINALLY INTENDED WITHOUT THE EXPRESSED WRITTEN CONSENT OF HB ENGINEERING, INC.	
FILE: c:\stiefel\stiefel\Dade City furnace1.dwg		PROJECT NO.: 07 - 610 - PT1	



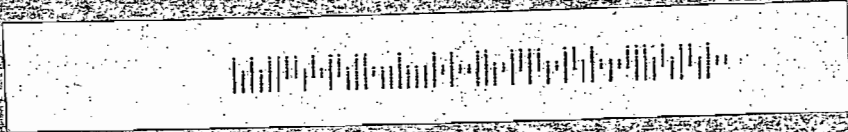
STIEFEL ALUMINUM, LLC Dade City, FL		DRAWING 2 OF 2	
SWEAT FURNACE WITH AFTERBURNER		SCALE: SEE ABOVE	
AFTERBURNER DETAIL		DATE: 08/28/2007	
PREPARED BY: IKE HABIB, P.E.		REV.: Dade City Revisions	
 <b>HB ENGINEERING, INC.</b> NORTH ROYALTON, OHIO		<small>THIS DRAWING IS THE PROPERTY OF HB ENGINEERING, INC. AND IT SHALL NOT BE REPRODUCED NOR USED EXCEPT AS ORIGINALLY INTENDED WITHOUT THE EXPRESSED WRITTEN CONSENT OF HB ENGINEERING, INC.</small>	
FILE: c:\k\stiefel\Dade City afterburner.dwg		PROJECT NO.: 07 - 610 - PTI	

John H. Level  
18105 Princess Pt Cir  
Tampa, FL 33647



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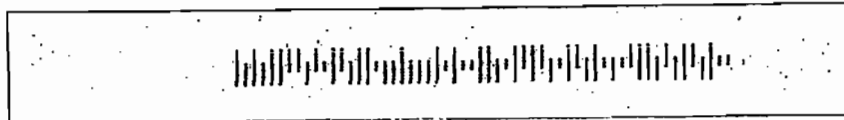
General Permits Section  
Bureau of Air Monitoring and Mobile Sources, MS 5514  
Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400



John Stietel  
18105 Princess Pt Cir.  
Tampa, FL 33647



General Permits Section  
Bureau of Air Monitoring and Mobile Sources, MS 5510  
Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400



SEP 17 2007

Bureau of Air Monitoring  
& Mobile Sources

# Department of Environmental Protection

## Division of Air Resource Management

### SECONDARY ALUMINUM SWEAT FURNACE AIR GENERAL PERMIT REGISTRATION FORM

#### General Information

The Florida Department of Environmental Protection has established a Title V air general permit at Rule 62-213.300(1)(f), F.A.C., for secondary aluminum sweat furnaces that are subject to the federal emission limiting standards and other requirements of 40 CFR Part 63, Subpart RRR, and that choose to comply with such requirements by installing and operating an afterburner device in accordance with the provisions of 40 CFR 63.1505(f)(1). A facility with one or more secondary aluminum sweat furnaces may use this Title V air general permit provided the facility meets the eligibility criteria set forth in the rule and, throughout the term of the general permit, maintains its eligibility to use the general permit and complies with all terms and conditions of the general permit.

Any facility wishing to use the Title V air general permit for secondary aluminum sweat furnaces must register its intent to use such general permit by completing and submitting this form to the Department of Environmental Protection. The form must be signed and certified by the "responsible official" of the facility. As defined at Rule 62-210.200, F.A.C., the responsible official is any one of the following:

- (a) For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.;
- (b) For a partnership or sole proprietorship, a general partner or the proprietor, respectively; or
- (c) For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.

Questions regarding this Title V air general permit, including registration procedures and information on the specific terms and conditions of its use, should be directed to:

General Permits Section  
Bureau of Air Monitoring and Mobile Sources, MS 5510  
Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

Telephone: (850) 488-0114 or the Small Business Assistance Program at 1-800-722-7457

Conditions and general procedures for use of the Title V air general permit for secondary aluminum sweat furnaces are found at Rules 62-213.300(1)(f) and 62-213.300(2)-(4), F.A.C. To assist persons registering for use of this air general permit, an abbreviated summary of these conditions and procedures follows.

**Disclaimer: The Title V air general permit for secondary aluminum sweat furnaces is a "permit-by-rule." Therefore, please refer to Rules 62-213.300(1)(f) and 62-213.300(2)-(4), F.A.C., for complete and up-to-date rule language. The summary that follows is not official rule language.**

## **Abbreviated Summary of Conditions and General Procedures**

**(1) Eligibility Determination.** The responsible official of the facility containing the secondary aluminum sweat furnace(s) shall determine the facility's eligibility for the Title V air general permit and notify the Department of intent to use the general permit.

- (a) A facility with one or more secondary aluminum sweat furnaces is eligible to operate under the terms and conditions of the Title V air general permit established at Rule 62-213.300(1)(f), F.A.C., provided the responsible official has submitted a completed Secondary Aluminum Sweat Furnace Air General Permit Registration Form to the Department at least 30 days prior to beginning operations under the general permit and, throughout the term of the general permit, all of the following conditions are met:
1. The facility operates no emissions units other than the secondary aluminum sweat furnace(s) and emissions units which are considered insignificant pursuant to the criteria of Rule 62-213.300(2)(a)1. F.A.C. (set forth in paragraph (1)(b) of this summary).
  2. The facility is classified as a Title V source pursuant to paragraph (f), only, of the definition of "major source of air pollution" at Rule 62-210.200, F.A.C.; that is, the facility is a Title V source by virtue of being subject to 40 CFR Part 63, Subpart RRR; adopted and incorporated by reference at Rule 62-204.800, F.A.C., but does not emit any pollutant in a major amount as set forth in paragraphs (a) through (e) of the definition of "major source of air pollution"; and
  3. The facility is not subject to any requirement of 40 CFR Parts 61 or 63, other than 40 CFR Part 63, Subparts A and RRR, adopted and incorporated by reference at Rule 62-204.800, F.A.C.
  4. The facility complies with all general conditions of Rule 62-213.300(3), F.A.C., and all requirements of 40 CFR Part 63, Subparts A and RRR, as applicable, except that:
    - a. In lieu of conducting a performance test to demonstrate compliance with the emission standard of 40 CFR 63.1505(f)(2), the owner or operator shall comply with the residence time and operating temperature requirements of 40 CFR 63.1505(f)(1); and
    - b. In lieu of submitting a written operation, maintenance, and monitoring plan to the Department, the owner or operator shall prepare and implement a plan that meets the criteria of 40 CFR 63.1510(b), operate the sweat furnace(s) in compliance with the operation, maintenance and monitoring plan at all times, and maintain the plan on-site and available for inspection by the Department.
- (b) No facility which contains an emissions unit, other than a secondary aluminum sweat furnace or a unit considered insignificant pursuant to this paragraph, shall be eligible to use the air general permit. No facility is eligible to use more than one air general permit. An emissions unit or activity shall be considered insignificant if all of the following criteria are met:
1. The emissions unit or activity would be subject to no unit-specific applicable requirement.
  2. The emissions unit or activity would neither emit nor have the potential to emit:
    - a. 500 pounds per year or more of lead and lead compounds expressed as lead;
    - b. 1,000 pounds per year or more of any hazardous air pollutants;
    - c. 2,500 pounds per year or more of total hazardous air pollutants; or
    - d. 5.0 tons per year or more each of any other regulated pollutants.
  3. The emissions unit or activity, in combination with other units and activities at the facility, would neither cause the facility to emit nor have the potential to emit:



- a. 100 tons per year or more of carbon monoxide, nitrogen oxides, particulate matter, sulfur dioxide, or volatile organic compounds;
  - b. 5 tons per year or more of lead and lead compounds expressed as lead;
  - c. 10 tons per year or more of any hazardous air pollutant;
  - d. 25 tons per year or more of total hazardous air pollutants; or
  - e. 100 tons per year or more of any other regulated pollutant.
- (c) Any facility that would use a Title V air general permit under Rule 62-213.300, F.A.C., must surrender all existing air permits other than the air general permit indicated in this registration form.
- (d) If a facility at any time becomes ineligible for the use of the Title V air general permit and is subject to the source-specific Title V air operation permit requirements of Chapter 62-213, F.A.C., it shall be subject to enforcement action for operating without an air operation permit.
- (e) Notwithstanding the shield provisions of Rule 62-213.460, F.A.C., any facility utilizing a Title V air general permit will be subject to enforcement action for operation without a permit under Chapter 62-213, F.A.C., if it is determined to be initially ineligible for the air general permit which is being utilized.
- (2) **Registration.** For each facility intending to operate under the provisions of a Title V air general permit, the responsible official must submit the correct registration form for the specific general permit to be utilized to give notice to the Department of intent to use such permit.

**Note: To register for use of the Title V air general permit for secondary aluminum sweat furnaces, complete pages 5-7 of this form, retain a copy for your files, and submit the completed form, signed and certified by the responsible official, to:**

**General Permits Section  
Bureau of Air Monitoring and Mobile Sources, MS 5510  
Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400**

- (3) **Administrative Corrections.** Within 30 days of any changes requiring corrections to information contained in this notification form, the responsible official shall notify the Department in writing. Such changes shall include:
- (a) Any change in name of the responsible official or facility address or phone number;
  - (b) A change in facility status requiring more frequent monitoring or reporting by the responsible official from that noted on the most recent notification form; and
  - (c) Any other similar minor administrative change at the facility.
- (4) **Violation of Permit.** The Title V air general permit for secondary aluminum sweat furnaces is valid only for the specific activity indicated. Any deviation from the specified activity and the conditions for undertaking that activity is a violation of the permit. The responsible official is placed on notice that violation of the permit constitutes grounds for revocation and suspension pursuant to Rules 62-4.100 and 62-4.530(4), F.A.C., and initiation of enforcement action pursuant to s. 403.141 through 403.161, F.S. No revocation shall become effective except after notice is served by personal service, certified mail, or newspaper notice pursuant to Section 120.60(5), F.S., upon the person or persons named therein and a hearing held, if requested within the time specified in the notice. The notice shall specify the provision of the law or rule alleged to be violated, or the permit condition or Department order alleged to be violated, and the facts alleged to constitute a violation thereof.

- (5) Nullification of Eligibility.** Eligibility for use of a Title V air general permit is automatically nullified by:
- (a) Submission of false or inaccurate information in the registration form for use of the Title V air general permit or in the required reports;
  - (b) Refusal of lawful inspection by Department staff;
  - (c) Failure to submit operational reports or other information required by the general permit; or
  - (d) Failure to timely pay the required annual emissions fee, penalty, or interest.
- (6) Use of Permit.** Any facility eligible to operate under the terms of a Title V air general permit may use the permit 30 days after giving notice to the Department without any agency action.



<b>POINT</b>	Office * <b>SWD</b>	<b>SW: TAMPA</b>	County * <b>PASCO</b>	AIRS ID <b>ARMINV01</b>
				<b>1010497</b>
Owner/Comp *	<b>STEIFEL ALUMINUM, INC</b>		Site	<b>STEIFEL ALUMINUM, INC</b>
Directions				
Street	<b>14999 old State Road 23, Bld Z</b>			
City *	<b>DADE CITY</b>	Zip	<b>33525</b>	
UTM Zone	East	North	Latitude	<b>00.0000</b> Longitude <b>00.0000</b>
Status *	<b>A</b> <b>ACTIVE</b>	Maj Group SIC *	<b>33</b> <b>PRIMARY METAL INDUSTRIES</b>	
Reloc	<b>N</b>	Shtdwn Dt	Strt Dt	Final Shtdwn Dt
Gov Fac *	<b>0</b> <b>NOT OWNED OR OPERATED BY A FEDERAL, STATE, OR LOCAL GOVE</b>		HAZ Waste Generator ID:	<b>FLD</b>
AOR Req *	<b>N</b>	Ozone SIP Facility *	<b>N</b>	Type <b>40</b> <b>SECONDARY ALUMINUM SWEAT FURNACE</b>
Compliance Tracking		Current Permit Indicator	<b>AG</b>	
Title V	<b>TITLE V</b>	non-HAP Class	<b>MINOR</b>	HAP Class <b>MINOR</b> Public Exempt <b>H</b>
# of Emis Units	C	A	I	Generator Rating <b>MW</b>
Comment	<b>Per Tallahassee, no emission units need to be defined for Title V general permits for aluminum sweat furnaces. Old AIRS</b>			

FILE # 1010497-002

**STIEFEL ALUMINUM, INC.**  
18105 Princess Point Circle  
Tampa, Florida 33647  
Voice (813) 951-2631 Fax (813) 907-8523

May 19, 2008

Certified mail Return Receipt Requested

General Permits Section  
Bureau of Air Monitoring and Mobile Sources, MS 5510  
Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

Re.: Air General Permit Registration for A Secondary Aluminum Sweat furnace.

Dear Sirs:

Stiefel Aluminum Inc is proposing to install a new aluminum sweat furnace at its facility at 14920 Citrus Country Drive in Dade City, Florida 33523. Installation will commence after thirty days from date of receipt of this registration. This sweat furnace which will be equipped with an afterburner that meets the design criteria and operation required by 40 CFR 63.1505(f)(1) and 63.1506(h). This Secondary Aluminum Processing Unit (SAPU) is our second emission unit and with this installation our facility remains an area source.

Stiefel Aluminum Inc will have the following:

- An afterburner temperature monitoring device and temperature data recorder.
- A written operation, maintenance, and monitoring (OM&M) plan, this plan will be maintained on-site.
- A written startup, shutdown and malfunction plan, this plan will be maintained on-site.

Should there be a need for additional information, please let us know.

Respectfully submitted,

  
John Stiefel, President

Cc.: Ike Habib, P.E. HB Engineering, Inc.

**SECONDARY ALUMINUM SWEAT FURNACE  
AIR GENERAL PERMIT REGISTRATION FORM**

RECEIVED  
MAY 30 2008  
Bureau of Air, Water,  
& Mobile Sources

**Registration Type**

Check one:

- NEW:** Initial registration for general permit for proposed *new* secondary aluminum sweat furnace(s).
- EXISTING:** Initial registration for general permit for *existing* secondary aluminum sweat furnace(s).
- RE-REGISTRATION:** Re-registration for general permit for secondary aluminum sweat furnace(s) upon expiration of current general permit.

**Facility Registration**

Facility Owner/Company Name (Name of corporation, agency, or individual owner):

STIEFEL ALUMINUM, INC.

Site Name (For example, plant name or number):

STIEFEL ALUMINUM, INC.

Facility Location: 14920 Citrus Country Drive

Street Address or Other Locator:

City: Dade City

County: Pasco

Zip Code: 33523

Facility Identification Number (DEP use only; do not fill in):

**1010497-002**

**Responsible Official**

Responsible Official Name: John Stiefel

Responsible Official Qualification (Check one or more of the following options, as applicable):

For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.

For a partnership or sole proprietorship, a general partner or the proprietor, respectively.

For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.

Responsible Official Mailing Address:

Organization/Firm: STIEFEL ALUMINUM, INC

Street Address: 18105 Princes Point Circle

City: Tampa

County: Hillsborough

Zip Code: 33647

Responsible Official Telephone Numbers...

Business: (813) 951-2631

Fax: (813) 907-8523

Mobile: (813) 951-2631

Responsible Official Email Address (optional): [johnstiefel@stiefelaluminum.com](mailto:johnstiefel@stiefelaluminum.com)

**Facility Description and Comments**

Number of secondary aluminum sweat furnace units on site: 2

Is each secondary aluminum sweat furnace equipped with an afterburner that has a design residence time of at least 0.8 seconds and a design operating temperature of at least 1600 degrees Fahrenheit, and is the manufacturer's documentation of these design specifications maintained on-site?  Y N (circle one)

If 'No,' explain \_\_\_\_\_  
\_\_\_\_\_

Does each secondary aluminum sweat furnace have an afterburner temperature monitoring device and temperature data recorder?  Y N (circle one)

If 'No,' explain \_\_\_\_\_  
\_\_\_\_\_

Does each secondary aluminum sweat furnace have a written operation, maintenance, and monitoring (OM&M) plan, and is this plan maintained on-site?  Y N (circle one)

If 'No,' explain \_\_\_\_\_  
\_\_\_\_\_

Does each secondary aluminum sweat furnace have a written startup, shutdown and malfunction plan, and is this plan maintained on-site?  Y N (circle one)

If 'No,' explain \_\_\_\_\_  
\_\_\_\_\_

List and briefly describe all other process operations at the site that may emit air pollutants (for example, scrap shredders, degreasers, paint shops, boilers, emergency generators, etc.). Add any comments about the facility that would be helpful to the Department in understanding the nature of your operation (for example, describe the products made, amount of materials used, air pollution control equipment employed, and hours of operation).

The sweat furnace will use substantially clean charge and post consumer aluminum wheels for production of high-grade aluminum alloys, equipped with three (3) dual fuel: natural gas and oil burners with total heat input of 1.5 MMBTH using either natural gas or No. 2 oil. Afterburner will be used to meet FAC 62-213.300 (a, (b) & (f) and 40 CFR Part 63.1505(f)(1) - with a design residence time of at least 0.8 seconds and a design operating temperature of at least 1600 degrees Fahrenheit. High quality iron scrap and ingots will be charged with no flux used. Products will be sold to the die cast industry.

**Emission Calculations:**

**1. Use of No. 2 Oil for Combustion**

Basis Furnace Operation: 12 hrs/day, 5 days/wk & 52 wk/yr.

Maximum volume of Oil needed by furnace & afterburner =  $\frac{1,500,000}{138,000} + 11.5 = 22.4 \text{ gallons / hr}$  use 23.0 gph

No. 2 Oil S% < 0.35%

**a. Total PM from No.2 Oil Combustion @ 2 lb/10<sup>3</sup> gal & AP-42 Emission Factor of 1.9 lbs/ton of Metal Processed**

Total PM consists of MP and PM-10. According to AP-42, the particle size distribution for uncontrolled PM emissions is 60% PM-10 and 40% PM.

$$\text{PM Emissions} = \frac{23.0 \times 2.0}{1000} + \frac{1.9 \times 800}{2000} = 0.8 \text{ lbs / hr}$$

$$\text{Total PM Annual Emissions} = 0.8 \times 12 \times 5 \times 52 / 2000 = 1.25 \text{ TPY}$$

$$\text{PM}_{10} = 0.6 \times 1.25 = 0.75 \text{ TPY}$$

b. Sulfur Dioxide from No. 2 Oil Combustion Emission Factor AP-42 = 142S/1000 gal\*

$$\text{Uncontrolled Sulfur Dioxide Emissions} = \frac{23.0 \times 142 \times 0.35}{1000} + \frac{0.9 \times 800}{2000} = 1.40 \text{ lbs / hr}$$

$$\text{Annual Sulfur Dioxide Emissions} = 12 \times 5 \times 52 \times 1.4 / 2000 = 2.18 \text{ TPY}$$

c. Nitrogen Oxides From No. 2 Oil Combustion & AP-42 Emission Factor of 0.76 lbs/ton of Metal Produced

$$\text{Nitrogen Oxides Emission Factor} = 20 / 1000 \text{ gal*}$$

$$\text{Nitrogen Oxides Emissions} = \frac{23.0 \times 20}{1000} + \frac{0.76 \times 800}{2000} = 0.76 \text{ lbs / hr}$$

$$\text{Annual Nitrogen Dioxide Emissions} = 12 \times 5 \times 52 \times 0.76 / 2000 = 1.18 \text{ TPY}$$

d. Carbon Monoxide From No. 2 Oil Combustion

$$\text{Carbon Monoxide Emission Factor} = 5 / 1000 \text{ gal*}$$

$$\text{Carbon Monoxide Emissions} = \frac{23 \times 5}{1000} = 0.11 \text{ lbs / hr}$$

$$\text{Emissions Potential PTE} = 12 \times 5 \times 52 \times 0.11 / 2000 = 0.18 \text{ TPY}$$

\*AP-42 Emission Factor for Distillate Oil

Emissions of Volatile Organic Compounds (VOC) – AP Emission Factor of 0.2 lbs/ton of Metal Produced

VOC Emissions will be destroyed by the afterburner at > 99% Emissions are negligible

**Summary Table Combustion of No. 2 Oil**

Pollutant	Lbs/hr	TPY
Total PM	0.8	1.25
Sulfur Dioxide	1.4	2.18
Nitrogen Oxides	0.76	1.18
Carbon Monoxide	0.11	0.18

## 2. Use of Natural Gas for Combustion

Basis Furnace Operation: 12 hrs/day, 5 days/wk & 52 wk/yr.

Maximum heat input = 23.0 *gph* x 138,000 = 3.17 *MMBTH*

Annual Natural Gas Consumption = 3.17 x 1000,000 x 12 x 5 x 52/1059 = 9,351,161 cubic feet per year

a. Total PM from Natural Gas Combustion @ 7.6 lb/10<sup>6</sup>\* & AP-42 Emission Factor of 1.9 lbs/ton of Metal Processed

Total PM consists of MP and PM-10. According to AP-42, the particle size distribution for uncontrolled PM emissions is 60% PM-10 and 40% PM.

Annual PM Emissions = (9.32x7.6 + (1.8 x800/2000) x 12 x5 x52)/2000 = 1.2 *TPY*

Hourly emissions rate = 1.2 x 2000/3120 = 0.74 lbs/hr

PM10 = 0.6 x 1.2 = 0.72 *TPY*

b. Sulfur Dioxide Emission Factor for Natural Gas AP-42 = 0.6/10<sup>6</sup>ft<sup>3</sup>\* and 0.9 lbs/ton of Metal Processed

Annual Sulfur Dioxide Emissions = (9.352x 0.6 + (0.9x800/2000) x 12 x 5 x 52)/2000 = 0.57 *TPY*

Hourly emissions rate = 0.57 x 2000/3120 = 0.36 lbs/hr

c. Nitrogen Oxides From Natural Gas Combustion 50 lbs/10<sup>6</sup>ft<sup>3</sup>\* & AP-42 Emission Factor of 0.76 lbs/ton of Metal Produced

Annual Nitrogen Dioxide Emissions = (9.352x50+ (0.76 x 800/2000) x 12 x 5 x 52 x 2000 = 0.71 *TPY*

Hourly emissions rate = 0.71x 2000/3120 = 0.45 lbs/hr

d. Carbon Monoxide From Natural Gas Combustion 84 lbs/10<sup>6</sup>ft<sup>3</sup>

Carbon Monoxide Emissions = 9.352 x 84/2000 = 0.39 *TPY*

Hourly emissions rate = 0.39 x 2000/3120 = 0.25 lbs/hr

\* AP-42, Table 1.4-1 & 2

**Summary Table Combustion of natural Gas**

Pollutant	Lbs/hr	TPY
Total PM	0.74	1.2
Sulfur Dioxide	0.36	0.57
Nitrogen Oxides	0.45	0.71
Carbon Monoxide	0.25	0.39





## RESIDENCE TIME DETERMINATION FOR NATURAL GAS

Basis:

**Sweat Furnace and afterburner at 3.17 MMBTH, natural gas at gross heat of 1059 BTU/ft<sup>3</sup>**

Flue gases from natural gas combustion of 1 ft<sup>3</sup> are 11.06 scf.

Total volume of flue gases =  $(3.17 \times 10^6 / 1059) \times 11.06 / 60 = 551.8$  scfm

By comparing the flue gases from #2 oil combustion of 570 scfm with the flue gases from natural gas combustion of 552 scfm there is no significant change.

Estimated infiltrated air volume at charge door = 400 scfm

Scenario No.1 – Melting: Charge Door Closed

Operation during melting: The charge door remains closed, exhaust gas volume to incinerator will contain vapors from scrap and will have less infiltrated air

Estimated exhaust volume =  $552 + 200 + 200 = 952$  scfm

Flue gases from sweat furnace will be at high temperature, afterburner burner will modulate down to maintain 1600 °F.

Scenario No.2 – Charging: Charge Door Open

Operation during charging

The sweat furnace main burners will operate on low fire when the charge door is opened, exhaust gas volume to incinerator will have less products of combustion, but will pickup more fumes, vapors and infiltrated air.

Estimated gas consumption =  $1.5 \times 0.4 + 1.5 = 2.1$  MMBTH

Estimated exhaust volume =  $(2.1 / 3.17) \times 552 + 200 + 400 = 366 + 100 + 400 = 866$  scfm

Flue gases from sweat furnace will be at low temperature, afterburner burner will modulate up to maintain 1600 °F.

Worst-case scenario is 970 scfm at 900 °F. Use 1000 scfm at 900 °F.

Air Enthalpy @ 900 °F = 6,227 Btu/lb mol

Air Enthalpy @ 1600 °F = 11,500 Btu/lb mol

Available Heat of natural gas @ 1600 °F = 600 Btu/ft<sup>3</sup>

Heat Balance – Heat Requirements

$$\Delta H = \left( \frac{1000}{379} \right) \times (11,500 - 6,227) = 13,913 \text{ BTU} / \text{min}$$

$$\Delta H \text{ plus heat loss } 10\% = 13,913 \times 1.1 \times 60 = 919,000 \text{ BTU/hr Or } 0.92 \text{ mmBTH}$$

$$\text{Volume of natural gas needed} = 920,000 / 600 = 1,533 \text{ ft}^3 / \text{hr.}$$

Exhaust Volume Determination:

$$1,000 \text{ scfm} \times (1600 + 460) / (70 + 460) = 3,887 \text{ scfm or}$$

$$v = 3,887 / 60 = 65 \text{ acfs}$$

Stiefel Aluminum, Inc.

**Sweat Furnace Afterburner Retention Time**

$$V = \pi/4 \times d^2 \times L$$

$$\text{Retention Time } t = V/v$$

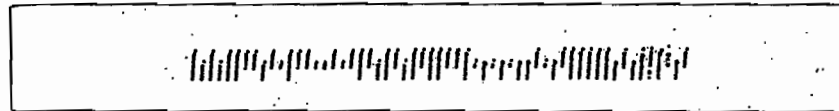
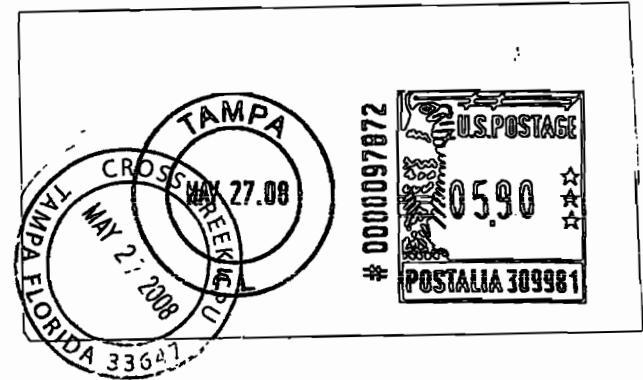
Where: Chamber Volume = V L x H = 4' x 4' L = length = 5.75'

$$V = 4 \times 4 \times 5.75 = 92 \text{ ft}^3$$

$$t = 92 \text{ ft}^3 / 65 \text{ acfs} = 1.41 \text{ seconds}$$

The indicated volume of natural gas is the maximum needed if the operating scenario prevails during one-hour, in reality the charging will be for a short period every hour. During the melting, the exhaust volume will decrease and temperature will increase, thus the fuel consumption by the afterburner will be less than shown.

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