

**From:** [Air.Pollution Control](#)  
**To:** [APC Permitting](#)  
**Subject:** FW: ESRN 65-0049-13 Heraeus Minor Mod  
**Date:** Thursday, October 5, 2023 3:59:23 PM  
**Attachments:** [Outlook-ssycvtuy](#)  
[ESRN 65-0049-13 Heraeus Minor Mod.pdf](#)

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**From:** Rina Mendoza <rmendoza@stevensehs.com>  
**Sent:** Thursday, October 5, 2023 3:42 PM  
**To:** Air.Pollution Control <Air.Pollution.Control@tn.gov>  
**Cc:** Shea Cofer <shea@stevensehs.com>; Morgan, Andrew N <andrew.morgan@heraeus.com>  
**Subject:** [EXTERNAL] ESRN 65-0049-13 Heraeus Minor Mod

**\*\*\* This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. \*\*\***

Good afternoon,

Heraeus submits the attached minor modification request for ESRN 65-0049 Source 13.

Please let me know if you have any questions.

Thank you,

Rina Mendoza

Staff Engineer



Nashville | Chattanooga | Birmingham  
615.982.0167

Heraeus Precious Metals North America LLC  
1975 Knoxville Highway  
Wartburg, TN 37887  
Phone (423) 346-1041  
Fax (423) 346-8655

October 5, 2023

Doug Wright  
Division of Air Pollution Control  
Tennessee Department of Environment & Conservation  
William R. Snodgrass Tennessee Tower  
312 Rosa L. Parks Avenue, 15th Floor  
Nashville, TN 37243

Subject: Heraeus Precious Metals North America, LLC  
ESRN 65-0049  
Permit No. 579181  
Minor Modification Request – Source 13 Increase Annual Material Process Limit

Dear Mr. Wright:

With this letter, Heraeus Precious Metals North America, LLC (Heraeus) submits a minor modification request for Source 13. The Source 13 Rhodium Oil Furnace will be modified by increasing the total annual raw material input limit. The appropriate forms and calculations for this modification are attached to this letter.

### Description of Change and Agreement

Source 13 includes one Rhodium Oil Furnace with baghouse. This modification requests an increased raw material input of 120.0 tons during any period of twelve consecutive months. Please update the permit to reflect this requested annual raw material input limit.

Heraeus will maintain the previous agreement to limit the PM emissions from Source 13 to 0.3 pounds per hour (lb/hr) in accordance with TAPCR 1200-.03-07-.01(5).

### Emissions Estimates

The modification to the source will increase the potential VOC emissions to 76.25 lb/hr and 73.22 tons per year (tpy). A recent EPA Method 24 lab analysis was performed on the input material for Source 13 which indicated the highest concentration of VOCs is 61% as opposed to 100% previously considered when calculating the potential VOC emissions. With the increase in Source 13 VOC emissions, potential Facility wide VOC emissions will be 91.96 tpy. No change to allowable particulate emissions or sulfur dioxide emissions is requested. The facility wide HAP emissions limit has been removed, and the potential HAP emissions for this source is very low. Heraeus will continue to track HAP emissions as required in Conditions E3-5 and E3-6 of the current permit.

## Suggested Permit Language

### **65-0049-13: Source Identification:** One (1) “Rhodium-Oil” Furnace with Baghouse Control.

Baghouse catch is recycled back to process for economic recovery. Use of a wet scrubber for product capture is not considered a control device. The scrubber receives exhaust flow input from the furnace and exhausts to the baghouse.

The baghouse control is considered inherent and not in the CAM program.

### **E13-3. Raw Material Input Limit**

The total raw material input to this source shall not exceed 120.0 tons during any period of twelve (12) consecutive months.

TAPCR 1200-03-07-.07(2), TAPCR 1200-03-10-.04(2), and agreement letter dated September 28, 2023

**Compliance Method:** A log of the raw material input to this source, in a form that readily shows compliance with this condition, must be maintained at the source location and kept available for inspection for the Technical Secretary. The HAPs emissions from this source shall be included in Condition E3-6. The logs shall be maintained at the source location and submitted in accordance with Condition E2.

### **E13-5. Volatile Organic Compounds Emission Limit**

Volatile organic compounds (VOC) emitted from the Rhodium Oil Furnace shall not exceed 73.5 tons during any period of twelve consecutive months.

TAPCR 1200-03-07-.07(2).

**Compliance Method:** The permittee shall assure compliance with the VOC emission limitation by complying with **conditions E13-1 and E13-3**.

## Minor Permit Modification Procedures

The following requirements for minor modifications to a Part 70 permit are found at TN Chapter 1200-03-09-.02(11)(f)5(ii).

(ii) Minor permit modification procedures:

(I) Minor permit modification procedures may be used only for those permit modifications that:

I. Do not violate any applicable requirement;

II. Do not involve significant changes to existing monitoring, reporting or recordkeeping requirements in the permit;

III. Do not require or change a case-by-case determination of an emission limitation or other standard required by the federal Act, or a source-specific determination for

temporary sources of ambient impacts as required by the federal Act, or a visibility or increment analysis as required by the federal Act;

IV. Do not seek to establish or change a permit term or condition for which there is no corresponding underlying applicable requirement and that the source has assumed to avoid an applicable requirement to which the source would otherwise be subject. Such terms and conditions include:

A. A federally enforceable emissions cap assumed to avoid classification as a modification under any provision of Title I of the federal Act. Further, federally enforceable emission caps assumed to avoid classification as a modification under chapter 1200-03-11, chapter 1200-30-16, Chapter 1200-03-31, paragraph 1200-03-09-.01(4) or paragraph 1200-03-09-.01(5) are included in the criteria of this section 1200-03-09-.02(11)(f)5(ii)(I)IVA.

B. An alternate emission limit approved pursuant to section 112(i)(5) of the federal Act or rule 1200-03-31-.06;

V. Are not modifications under Title I of the federal Act or the federal regulations promulgated pursuant thereto. Further, the minor permit modification process may be used only for changes that are not modifications under chapter 1200-03-11, Chapter 1200-03-31, chapter 1200-03-16, paragraph 1200-03-09-.01(4) or paragraph 1200-03-09-.01(5); and

VI. Are not otherwise required in paragraph 1200-03-09-.02(11) to be processed as a significant modification.

I hereby certify that the increased annual raw material process limit for the source 13 rhodium oil furnace meets the criteria for a minor modification and formally request that the Division use minor modification procedures to account for these minor modifications in the Part 70 permit.

If you have questions or comments, please contact Andrew Morgan, Environmental Manager at (423) 346-1065, or my consultant, Shea Cofer, at (615) 418-1414.

Sincerely,



Uve Kupka  
President HPM Americas

Attachments



**Attachments:**

**Process Flow Diagram  
Minor Modification Application Forms  
Emission Calculations**



## TITLE V PERMIT APPLICATION INDEX OF AIR POLLUTION PERMIT APPLICATION FORMS

Section 1: Identification and Diagrams		
This application contains the following forms:	APC Form 1, Facility Identification	1
	APC Form 2, Operations and Flow Diagrams	1

Section 2: Emission Source Description Forms		
		Total number of this form
This application contains the following forms (one form for each incinerator, printing operation, fuel burning installation, etc.):	APC Form 3, Stack Identification	1
	APC Form 4, Fuel Burning Non-Process Equipment	1
	APC Form 5, Stationary Gas Turbines or Internal Combustion Engines	
	APC Form 6, Storage Tanks	
	APC Form 7, Incinerators	
	APC Form 8, Printing Operations	
	APC Form 9, Painting and Coating Operations	
	APC Form 10, Miscellaneous Processes	1
	APC Form 33, Stage I and Stage II Vapor Recovery Equipment	
	APC Form 34, Open Burning	

Section 3: Air Pollution Control System Forms		
		Total number of this form
This application contains the following forms (one form for each control system in use at the facility):	APC Form 11, Control Equipment - Miscellaneous	
	APC Form 13, Adsorbers	
	APC Form 14, Catalytic or Thermal Oxidation Equipment	
	APC Form 15, Cyclones/Settling Chambers	
	APC Form 17, Wet Collection Systems	
	APC Form 18, Baghouse/Fabric Filters	1

(OVER)

### Section 4: Compliance Demonstration Forms

		Total number of this form
This application contains the following forms (one form for each incinerator, printing operation, fuel burning installation, etc.):	APC Form 19, Compliance Certification - Monitoring and Reporting - Description of Methods for Determining Compliance	1
	APC Form 20, Continuous Emissions Monitoring	
	APC Form 21, Portable Monitors	
	APC Form 22, Control System Parameters or Operating Parameters of a Process	1
	APC Form 23, Monitoring Maintenance Procedures	
	APC Form 24, Stack Testing	
	APC Form 25, Fuel Sampling and Analysis	
	APC Form 26, Record Keeping	1
	APC Form 27, Other Methods	1
	APC Form 28, Emissions from Process Emissions Sources / Fuel Burning Installations / Incinerators	1
	APC Form 29, Emissions Summary for the Facility or for the Source Contained in This Application	1
	APC Form 30, Current Emissions Requirements and Status	1
	APC Form 31, Compliance Plan and Compliance Certification	1
	APC Form 32, Air Monitoring Network	

### Section 5: Statement of Completeness and Certification of Compliance

I have reviewed this application in its entirety and to the best of my knowledge, and based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate, and complete. I have provided all the information that is necessary for compliance purposes and this application consists of **26** pages and they are numbered from page **1** to **26**. The status of this facility's compliance with all applicable air pollution control requirements, including the enhanced monitoring and compliance certification requirements of the Federal Clean Air Act, is reported in this application along with the methods to be used for compliance demonstration.

**Uve Kupka, President, HPM Americas**

**(423) 346-8200**

Name and Title of Responsible Official

Telephone Number with Area Code

**10/05/2023**

Signature of Responsible Official

Date of Application

(For definition of responsible official, see instructions for APC Form 1)

State of Tennessee  
 Department of Environment and Conservation  
 Division of Air Pollution Control  
 William R. Snodgrass Tennessee Tower  
 312 Rosa L. Parks Avenue, 15<sup>th</sup> Floor  
 Nashville, TN 37243  
 Telephone: (615) 532-0554



APC 1

## TITLE V PERMIT APPLICATION FACILITY IDENTIFICATION

SITE INFORMATION				
1. Organization's legal name <b>Heraeus Precious Metals North America, LLC</b>			For APC Use Only	APC company point no.
2. Site name (if different from legal name)				APC Log/Permit no.
3. Site address (St./Rd./Hwy.) <b>1975 Knoxville Highway</b>			NAICS or SIC Code <b>331492</b>	
City or distance to nearest town <b>Wartburg</b>		Zip code <b>37887</b>	County name <b>Morgan</b>	
4. Site location (in Lat./Long)	Latitude <b>36.095278</b>		Longitude <b>084.548889</b>	
CONTACT INFORMATION (RES PONSIBLE OFFICIAL)				
5. Responsible official contact <b>Uve Kupka, President, HPM Americas</b>			Phone number with area code <b>423-346-8200</b>	
6. Mailing address (St./Rd./Hwy.) <b>1975 Knoxville Highway</b>			Fax number with area code	
City <b>Wartburg</b>	State <b>TN</b>	Zip code <b>37887</b>	Email address <b>uve.kupka@heraeus.com</b>	
CONTACT INFORMATION (TECHNICAL)				
7. Principal technical contact <b>Andrew Morgan</b>			Phone number with area code <b>423-346-1065</b>	
8. Mailing address (St./Rd./Hwy.) <b>1975 Knoxville Highway</b>			Fax number with area code	
City <b>Wartburg</b>	State <b>TN</b>	Zip code <b>37887</b>	Email address <b>andrew.morgan@heraeus.com</b>	
CONTACT INFORMATION (BILLING)				
11. Billing contact <b>Andrew Morgan</b>			Phone number with area code <b>423-346-1065</b>	
12. Mailing address (St./Rd./Hwy.) <b>1975 Knoxville Highway</b>			Fax number with area code	
City <b>Wartburg</b>	State <b>TN</b>	Zip code <b>37887</b>	Email address <b>andrew.morgan@heraeus.com</b>	
TYPE OF PERMIT REQUESTED				
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>13. Permit requested for:</p> <p style="margin-left: 40px;">Initial application to operate : <input type="checkbox"/></p> <p style="margin-left: 40px;">Permit renewal to operate : <input type="checkbox"/></p> <p style="margin-left: 40px;">Administrative permit amendment : <input type="checkbox"/></p> </div> <div style="width: 45%;"> <p style="margin-left: 40px;">Minor permit modification : <input checked="" type="checkbox"/></p> <p style="margin-left: 40px;">Significant modification : <input type="checkbox"/></p> <p style="margin-left: 40px;">Construction permit : <input type="checkbox"/></p> </div> </div>				

(OVER)

**HAZARDOUS AIR POLLUTANTS, DESIGNATIONS, AND OTHER PERMITS ASSOCIATED WITH FACILITY**

14. Is this facility subject to the provisions governing prevention of accidental releases of hazardous air contaminants contained in Chapter 1200-03-32 of the Tennessee Air Pollution Control regulations?

☐

Yes

☒

No

If the answer is Yes, are you in compliance with the provisions of Chapter 1200-03-32 of the Tennessee Air Pollution Control regulations?

☐

Yes

☐

No

15. If facility is located in an area designated as "Non-Attainment" or "Additional Control", indicate the pollutant(s) for the designation.

Not Applicable

16. List all valid Air Pollution permits issued to the sources contained in this application [identify all permits with most recent permit numbers and emission source reference numbers listed on the permit(s)].

Permit No.	Emission Source No.
579181	65-0049

17. Page number :

Revision number:

Date of revision:



## TITLE V PERMIT APPLICATION OPERATIONS AND FLOW DIAGRAMS

1. Please list, identify, and describe briefly process emission sources, fuel burning installations, and incinerators that are contained in this application. Please attach a flow diagram for this application.

Source No. 65-0049-13

Description: One Rhodium Oil Furnace with baghouse control

2. List all insignificant activities which are exempted because of size or production rate and cite the applicable regulations.

Insignificant Source	Applicable Regulations
Plume Suppressor	1200-3-9-.04(4)(a)
Low Grade Blender	1200-3-9-.04(2)(a)(3)
Tube Leach & Cutting Operations	1200-3-9-.04(2)(a)(3)
Two electrically heated induction furnaces	1200-3-9-.04(2)(a)(3)
Electric Carbon re-burn furnace	1200-3-9-.04(2)(a)(3)
Propane Storage Tank	1200-3-9-.04(5)(f)(43)
MBK mixing	1200-3-9-.04(2)(a)(3)
Newark Sampling Lab	1200-03-09-.04(5)(f)19

3. Are there any storage piles?

YES \_\_\_\_\_ NO X

4. List the states that are within 50 miles of your facility.

Kentucky

5. Page number:

Revision Number:

Date of Revision:



## TITLE V PERMIT APPLICATION COMPLIANCE PLAN AND COMPLIANCE CERTIFICATION

### GENERAL IDENTIFICATION AND DESCRIPTION

1. Facility name:

**Heraeus Precious Metals North America, LLC**

2. List all the process emission source(s) or fuel burning installation(s) or incinerator(s) that are part of this application.

**One Rhodium Oil Furnace with baghouse control**

### COMPLIANCE PLAN AND CERTIFICATION

3. Indicate that source(s) which are contained in this application are presently in compliance with all applicable requirements, by checking the following:

\_\_\_\_\_ A. Attached is a statement of identification of the source(s) currently in compliance. We will continue to operate and maintain the source(s) to assure compliance with all the applicable requirements for the duration of the permit.

**X** \_\_\_\_\_ B. APC 30 form(s) includes new requirements that apply or will apply to the source(s) during the term of the permit. We will meet such requirements on a timely basis.

4. Indicate that there are source(s) that are contained in this application which are not presently in full compliance, by checking both of the following:

**NA** \_\_\_\_\_ A. Attached is a statement of identification of the source(s) not in compliance, non-complying requirement(s), brief description of the problem, and the proposed solution.

**NA** \_\_\_\_\_ B. We will achieve compliance according to the following schedule:

Action

Deadline

Progress reports will be submitted:

Start date: **NA** \_\_\_\_\_ and every 180 days thereafter until compliance is achieved.

5. State the compliance status with any applicable compliance assurance monitoring and compliance certification requirements that have been promulgated under section 114(a)(3) of the Clean Air Act as of the date of submittal of this APC 31.

**NA**

6. Page number:

Revision number:

Date of revision:



# **TITLE V PERMIT APPLICATION EMISSION SUMMARY FOR THE FACILITY OR FOR THE SOURCES CONTAINED IN THIS APPLICATION**

## **GENERAL IDENTIFICATION AND DESCRIPTION**

1. Facility name: Heraeus Precious Metals North America, LLC

## **EMISSIONS SUMMARY TABLE – CRITERIA AND SELECTED POLLUTANTS**

2. Complete the following emissions summary for regulated air pollutants at this facility or for the sources contained in this application.

Air Pollutant	Summary of Maximum Allowable Emissions		Summary of Actual Emissions	
	Tons per Year	Reserved for State use (Pounds per Hour- Item 4, APC 28)	Tons per Year	Reserved for State use (Pounds per Hour- Item 4, APC 28)
Particulate Matter (TSP)	32.69		32.69	
Sulfur Dioxide	0.15		0.15	
Volatile Organic Compounds	91.96		91.96	
Carbon Monoxide	16.12		16.12	
Lead	0.19		0.19	
Nitrogen Oxides	19.24		19.24	
Total Reduced Sulfur				
Mercury				
Asbestos				
Beryllium				
Vinyl Chlorides				
Fluorides				
Gaseous Fluorides				
Greenhouse Gases in CO <sub>2</sub> Equivalents	44,153		44,153	

( Continued on next page )



3. Complete the following emissions summary for regulated air pollutants that are hazardous air pollutant(s) at this facility or for the sources contained in this application.

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4. Page number: \_\_\_\_\_ Revision number: \_\_\_\_\_ Date of revision: \_\_\_\_\_

# Heraeus

## Facility Wide Emissions Summary

Source		PM <sub>Total</sub>		PM <sub>10f</sub>		PM <sub>2.5f</sub>		PM <sub>Cond</sub>		NO <sub>x</sub>		CO		SO <sub>2</sub>		VOC		CO <sub>2</sub> eq	
Name	ESRN	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
8 Roasting Ovens, Chamber Furnace, Burning Chamber w. Oxidizers and Scrubber. Cooling Chambers and reburn w. BH	65-0049-01	2.61	11.45	0.04	0.19	0.04	0.19	0.13	0.57	2.27	9.94	2.00	8.77	0.01	0.06	2.43	10.64	--	29987.2
Ball Mills 1, 2, 3, 4, 5, 6 and Blenders and Tray Loading	65-0049-04	3.82	16.74	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rotary Furnace	65-0049-09	0.09	0.41	2.79E-03	0.01	2.79E-03	0.01	8.38E-03	0.04	0.07	0.32	0.47	2.06	8.82E-04	3.86E-03	0.11	0.47	--	7240.78
Diesel Emergency Engine	65-0049-11	0.38	0.10	0.19	0.05	0.18	0.05	0.03	0.01	12.21	3.05	3.24	0.81	0.19	0.05	0.34	0.09	--	156.11
Tray Furnaces, Inductotherm Electric Melting Furnaces, and Cooling Chambers; Drum Furnace and Converter; New Ball Mills and Metal Processing Equipment	65-0049-12	0.83	3.64	0.83	3.64	0.01	0.04	0.02	0.09	0.44	1.93	0.29	1.26	0.00	0.01	1.68	7.36	--	2020.91
Plume Suppressor (Insignificant)		0.06	0.26	0.01	0.07	0.01	0.07	0.04	0.20	0.78	3.44	0.66	2.89	0.00	0.02	0.04	0.19	--	4103.07
Rh Furnace	65-0049-13	0.21	0.09	1.29E-02	5.63E-02	1.29E-02	5.63E-02	8.36E-03	3.66E-02	0.13	0.56	0.07	0.32	1.37E-03	6.00E-03	76.25	73.22	--	644.96
Facility Total		8.01	32.69	1.09	4.01	0.27	0.41	0.24	0.93	15.91	19.24	6.74	16.12	0.22	0.15	80.86	91.96	--	44153.05

Source		Arsenic 7440-38-2		Cobalt 7440-48-4		Chromium 7440-47-3		Nickel 8049-31-8		Lead 7439-92-1		Selenium 7782-49-2		Cadmium		Antimony		Methanol		Phosphorous		HCl		HF		Total HAP
Name	ESRN	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(tpy)
8 Roasting Ovens, Chamber Furnace, Burning Chamber w. Oxidizers and Scrubber. Cooling Chambers and reburn w. BH	65-0049-01	0.20	0.87	0.17	0.73	0.07	0.29	0.10	0.42	0.02	0.07	0.25	1.09	0.02	0.07	1.66E-03	0.01	0.40	1.77	--	--	0.75	3.27	0.002	0.01	8.61
Ball Mills 1, 2, 3, 4, 5, 6 and Blenders and Tray Loading	65-0049-04	0.46	2.01	0.38	1.68	0.15	0.67	0.22	0.98	0.02	0.08	0.57	2.49	0.04	0.17	3.82E-03	0.02	--	--	--	--	--	--	--	--	8.10
Rotary Furnace	65-0049-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.61E-05	3.77E-04	--	--	--	--	--	--	0.00
Diesel Emergency Engine	65-0049-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tray Furnaces, Inductotherm Electric Melting Furnaces, and Cooling Chambers; Drum Furnace and Converter; New Ball Mills and Metal Processing Equipment	65-0049-12	--	--	0.01	0.04	--	--	0.01	0.04	0.01	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	0.11	
Plume Suppressor (Insignificant)		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rh Furnace	65-0049-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.19	0.00	--	--	--	--	0.00	
Facility Total		0.66	2.88	0.56	2.45	0.22	0.96	0.33	1.44	0.04	0.19	0.82	3.58	0.05	0.24	0.01	0.02	0.40	1.77	0.19	0.00	0.75	3.27	0.00	0.01	16.82

1. Facility name: Heraeus Precious Metals North America, LLC	
2. Process emission source (identify): 65-0049-13 -One Rhodium Oil Furnace with baghouse control	
3. Stack ID or flow diagram point identification(s): S13-1	4. Year of construction or last modification: 2020
If the emissions are controlled for compliance, attach an appropriate Air Pollution Control system form.	
5. Normal operating schedule: 24 Hrs./Day 7 Days/Wk. 365 Days/Yr.	
6. Location of this process emission source in UTM coordinates: UTM Vertical : 720612 UTM Horizontal: 3997283	
7. Describe this process (Please attach a flow diagram of this process) and check one of the following:  <input checked="checked" type="checkbox"/> Batch <input type="checkbox"/> Continuous	

8. List the types and amounts of raw materials input to this process:			
Material	Storage/Material handling process	Average usage (units)	Maximum usage (units)
Precious Metal Bearing	Material is stored in drums	120	120
Material		(Tons/Year)	(Tons/Year)
9. List the types and amounts of primary products produced by this process:			
Material	Storage/Material handling process	Average usage (units)	Maximum usage (units)
10. Process fuel usage:			
Type of fuel	Max heat input (10 <sup>6</sup> BTU/Hr.)	Average usage (units)	Maximum usage (units)
Natural Gas	0.9	882 (scf/hr)	882 (scf/hr)
Propylene			
Diesel	0.9	6.43 (gal/hr)	6.43 (gal/hr)
11. List any solvents, cleaners, etc., associated with this process:			
NA			

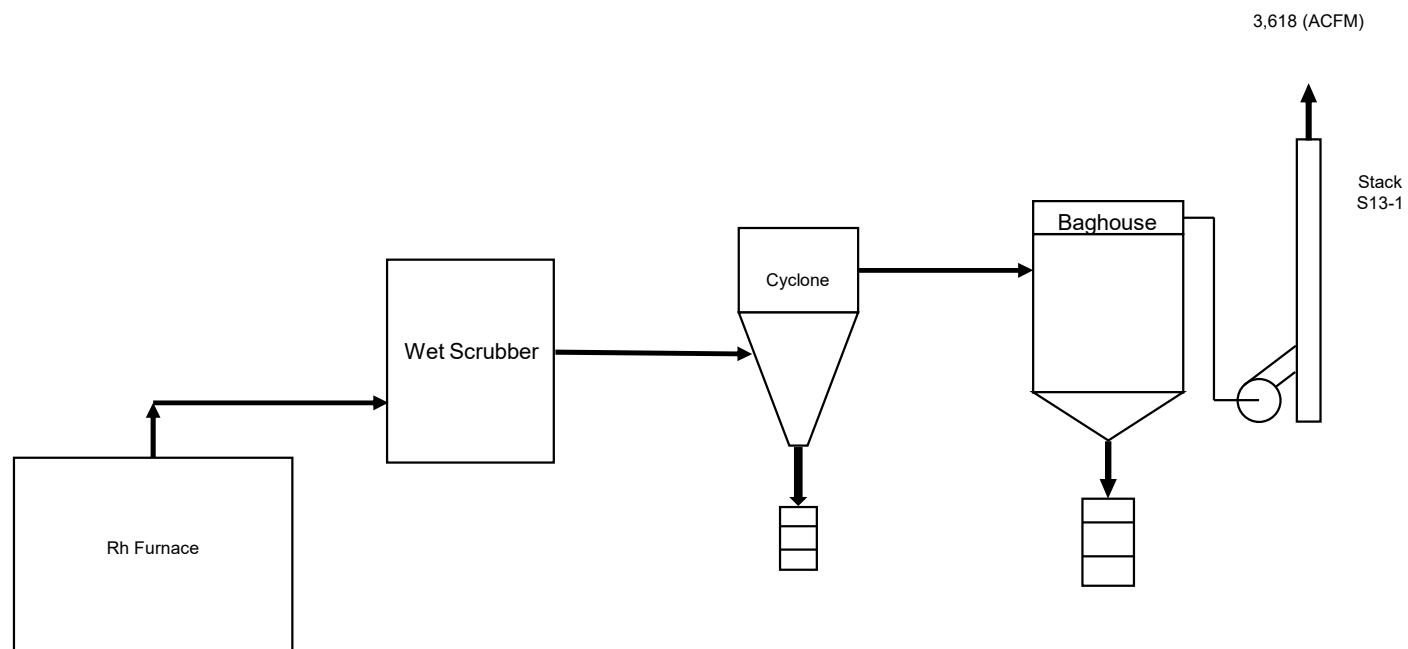
If the emissions and/or operations of this process are monitored for compliance, please attach the appropriate Compliance Demonstration form.

12. Describe any fugitive emissions associated with this process, such as outdoor storage piles, open conveyors, open air sand blasting, material handling operations, etc. (please attach a separate sheet if necessary).

NA

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13. Page number: Revision Number: Date of Revision:





## TITLE V PERMIT APPLICATION FUEL BURNING NON-PROCESS EQUIPMENT

GENERAL IDENTIFICATION AND DESCRIPTION				
1. Facility name: Heraeus Precious Metals North America, LLC				
2. Stack ID or flow diagram point identification (s): Stack 13-1				
FUEL BURNING EQUIPMENT DESCRIPTION				
3. List all fuel burning equipment that is at this fuel burning installation (please complete an APC 4 form for each piece of fuel burning equipment).  Rhodium Oil Furnace				
4. Fuel burning equipment identification number: RH Oil Furnace				
5. Fuel burning equipment description:  Equipped with a 900,000 Btu/hr natural gas/diesel burner				
6. Year of installation or last modification of fuel burning equipment. 2018				
7. Furnace type:  Rhodium Oil Furnace		8. Manufacturer model number (if available):		
9. Location of this fuel burning installation in UTM coordinates: UTM Vertical: <u>720612</u> UTM Horizontal: <u>3997283</u>				
10. Normal operating schedule: <u>7</u> Hrs./Day <u>24</u> Days/Wk. <u>365</u> Days/Yr.				
FUELS, CONTROLS, AND MONITORING DESCRIPTION				
11. Maximum rated heat input capacity (in million BTU/Hour) 0.15 MMBtu/hr		12. If wood is used as a fuel, specify the amount of wood used as a fraction of total heat input.		
13. Fuels:	Primary fuel	Backup fuel #1	Backup fuel #2	Backup fuel #3
Fuel name	Natural Gas	Diesel		
Actual yearly consumption	7.7 MMCF	56.3 (10 <sup>3</sup> gal)		
14. If emissions from this fuel burning equipment are controlled for compliance, please specify the type of control: NA				
15. If emissions from this fuel burning equipment are monitored for compliance, please specify the type of monitoring: NA				
16. Describe any fugitive emissions associated with this process, such as outdoor storage piles, open conveyors, material handling operations, etc. (please attach a separate sheet if necessary). NA				
17. Page number:		Revision Number:		Date of Revision:



## TITLE V PERMIT APPLICATION STACK IDENTIFICATION

GENERAL IDENTIFICATION AND DESCRIPTION	
1. <b>Facility name:</b> Heraeus Precious Metals North America, LLC	
2. <b>Emission source (identify):</b> 65-0049-13	
STACK DESCRIPTION	
3. <b>Stack ID (or flow diagram point identification):</b> One Rhodium Oil Furnace with baghouse control	
4. <b>Stack height above grade in feet:</b> 25	
5. <b>Velocity (data at exit conditions):</b> 43 _____ (Actual feet per second)	6. <b>Inside dimensions at outlet in feet:</b> 1.3
7. <b>Exhaust flowrate at exit conditions (ACFM):</b> 3,618	8. <b>Flow rate at standard conditions (DSCFM):</b> 1,539
9. <b>Exhaust temperature:</b> 350 _____ Degrees Fahrenheit (°F)	10. <b>Moisture content (data at exit conditions):</b> 35 _____ Percent _____ Grains per dry standard cubic foot (gr./dscf)
11. <b>Exhaust temperature that is equaled or exceeded during ninety (90) percent or more of the operating time ( <u>for stacks subject to diffusion equation only</u>):</b> <div style="text-align: center;">NA _____ (°F)</div>	
12. <b>If this stack is equipped with continuous pollutant monitoring equipment required for compliance, what pollutant(s) does this equipment monitor (e.g., Opacity, SO<sub>2</sub>, NO<sub>x</sub>, etc.)?</b> NA	
Complete the appropriate APC form(s) 4, 5, 7, 8, 9, or 10 for each source exhausting through this stack.	
BYPASS STACK DESCRIPTION	
13. <b>Do you have a bypass stack?</b> <div style="text-align: center;">             _____ Yes      <b>X</b> _____ No           </div> <p>If yes, describe the conditions which require its use &amp; complete APC form 4 for the bypass stack. Please identify the stack number(s) of flow diagram point number(s) exhausting through this bypass stack.</p>	
14. <b>Page number:</b> _____ <b>Revision Number:</b> _____ <b>Date of Revision:</b> _____	

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**TITLE V PERMIT APPLICATION**  
**COMPLIANCE CERTIFICATION - MONITORING AND REPORTING**  
**DESCRIPTION OF METHODS USED FOR DETERMINING COMPLIANCE**

All sources that are subject to 1200-03-09-.02(11) of the Tennessee Air Pollution Control Regulations are required to certify compliance with all applicable requirements by including a statement within the permit application of the methods used for determining compliance. This statement must include a description of the monitoring, recordkeeping, and reporting requirements and test methods. In addition, the application must include a schedule for compliance certification submittals during the permit term. These submittals must be no less frequent than annually and may need to be more frequent if specified by the underlying applicable requirement or the Technical Secretary.

**GENERAL IDENTIFICATION AND DESCRIPTION**

1. Facility name: Heraeus Precious Metals North America, LLC
2. Process emission source, fuel burning installation, or incinerator (identify): One Rhodium Oil Furnace with baghouse control
3. Stack ID or flow diagram point identification(s): S13-1

**METHODS OF DETERMINING COMPLIANCE**

4. This source as described under Item #2 of this application will use the following method(s) for determining compliance with applicable requirements (and special operating conditions from an existing permit). Check all that apply and attach the appropriate form(s)
  - ☐ Continuous Emission Monitoring (CEM) - APC 20  
Pollutant(s): \_\_\_\_\_
  - ☐ Emission Monitoring Using Portable Monitors - APC 21  
Pollutant(s): \_\_\_\_\_
  - ☒ Monitoring Control System Parameters or Operating Parameters of a Process - APC 22  
Pollutant(s): PM
  - ☐ Monitoring Maintenance Procedures - APC 23  
Pollutant(s): \_\_\_\_\_
  - ☐ Stack Testing - APC 24  
Pollutant(s): \_\_\_\_\_
  - ☐ Fuel Sampling & Analysis (FSA) - APC 25  
Pollutant(s): \_\_\_\_\_
  - ☒ Recordkeeping - APC 26  
Pollutant(s): PM, VOC & HAP
  - ☒ Other (please describe) - APC 27  
Pollutant(s): Visible Emissions

5. Compliance certification reports will be submitted to the Division according to the following schedule:  
 Start date: One year from receipt of Title V Operating Permit  
 And every 365 days thereafter.

6. Compliance monitoring reports will be submitted to the Division according to the following schedule:  
 Start date: 180 Days from receipt of Title V Operating Permit  
 And every 180 days thereafter.

7. Page number: \_\_\_\_\_ Revision number: \_\_\_\_\_ Date of revision: \_\_\_\_\_





**TITLE V PERMIT APPLICATION - COMPLIANCE DEMONSTRATION BY  
 MONITORING CONTROL SYSTEM PARAMETERS OR OPERATING PARAMETERS OF A PROCESS**

The monitoring of a control system parameter or a process parameter shall be acceptable as a compliance demonstration method provided that a correlation between the parameter value and the emission rate of a particular pollutant is established.

**GENERAL IDENTIFICATION AND DESCRIPTION**

1. Facility name: Heraeus Precious Metals North America, LLC	2. Stack ID or flow diagram point identification(s) S13-1
3. Emission source: One Rhodium Oil Furnace with baghouse control	

**MONITORING DESCRIPTION**

4. Pollutant(s) being monitored: PM
5. Description of the method of monitoring and establishment of correlation between the parameter value and the emission rate of a particular pollutant: Compliance with the 0.3 per hour (lb/hr) particulate emission limit shall be assured by maintaining the required minimum pressure drop value of 0.1 inches of water column for the baghouse. The pressure drop value shall be recorded once daily when the source is in operation. Days when the source is not operating shall be noted. For lower pressure drop reading(s) resulting from replacement of bags, the permittee shall record the deviation(s) as such in their daily records. Due allowance will be made for lower pressure drop reading(s) which follow replacement of bags, provided the permittee establishes to the satisfaction of the Technical Secretary that these lower readings resulted from the replacement of bags. All data, including all required calculations, must be entered in the log no later than 7 days from the end of the day for which the data is required. The logs shall be maintained at the source location and submitted in accordance with Condition E2.
6. Compliance demonstration frequency (specify the frequency with which compliance will be demonstrated): Once per day for baghouse pressure drop.

7. Page number:	Revision number:	Date of revision:
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## TITLE V PERMIT APPLICATION COMPLIANCE DEMONSTRATION BY RECORDKEEPING

Recordkeeping shall be acceptable as a compliance demonstration method provided that a correlation between the parameter value recorded and the applicable requirement is established.

### GENERAL IDENTIFICATION AND DESCRIPTION

1. Facility name: Heraeus Precious Metals North America, LLC	2. Stack ID or flow diagram point identification(s): S13-1
3. Emission source (identify): One Rhodium Oil Furnace with baghouse control	

### MONITORING AND RECORDKEEPING DESCRIPTION

4. Pollutant(s) or parameter being monitored: PM, VOC, HAP
5. Material or parameter being monitored and recorded: Material input, pressure drop across baghouse
6. Method of monitoring and recording: Material process weight will be logged daily and material information will be retained at the facility that identifies VOCs and HAPs for a minimum of five (5) years.  Monthly emissions will be logged and recorded each month and retained for a minimum of five (5) years.  Pressure drop will be recorded daily while the source is in operation and retained for a minimum of five (5) years.
7. Compliance demonstration frequency (specify the frequency with which compliance will be demonstrated): As noted above.

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## TITLE V PERMIT APPLICATION COMPLIANCE DEMONSTRATION BY OTHER METHOD(S)

GENERAL IDENTIFICATION AND DESCRIPTION		
1. Facility name: Heraeus Precious Metals North America, LLC	2. Stack ID or flow diagram point identification(s): S13-1	
3. Emission source (identify): One Rhodium Oil Furnace with baghouse control		
MONITORING DESCRIPTION		
4. Pollutant(s) or parameter being monitored: Visible Emissions		
5. Description of the method of monitoring: Compliance with this emission limitation shall be certified through utilization of the Division's Opacity Matrix dated June 18, 1996, and amended September 11, 2013.		
6. Compliance demonstration frequency (specify the frequency with which compliance will be demonstrated): Compliance demonstration frequency shall be in accordance with the Opacity Matrix.		
7. Page number:	Revision number:	Date of revision:



## TITLE V PERMIT APPLICATION

### EMISSIONS FROM PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR

GENERAL IDENTIFICATION AND DESCRIPTION				
1. Facility name: Heraeus Precious Metals North America, LLC			2. Stack ID or flow diagram point identification(s): S13-1	
3. Process emission source / Fuel burning installation / Incinerator (identify): One Rhodium Oil Furnace with baghouse control				
EMISSIONS SUMMARY TABLE – CRITERIA AND FUGITIVE EMISSIONS				
4. Complete the following <u>emissions summary for regulated air pollutants</u> . Fugitive emissions shall be included. Attach calculations and emission factor references.				
Air Pollutant	Maximum Allowable Emissions		Actual Emissions	
	Tons per Year	Reserved for State use (Pounds per Hour - Item 7, APC 30 )	Tons per Year	Reserved for State use (Pounds per Hour - Item 8, APC 30 )
Particulate Matter ( TSP )	0.09		0.09	
( Fugitive Emissions )				
Sulfur Dioxide	6.00E-3		6.00E-3	
( Fugitive Emissions )				
Volatile Organic Compounds	73.22		73.22	
( Fugitive Emissions )				
Carbon Monoxide	0.32		0.32	
( Fugitive Emissions )				
Lead				
( Fugitive Emissions )				
Nitrogen Oxides	0.56		0.56	
( Fugitive Emissions )				
Total Reduced Sulfur				
( Fugitive Emissions )				
Mercury				
( Fugitive Emissions )				
( Continued on next page )				

## EMISSIONS SUMMARY TABLE – FUGITIVE HAZARDOUS AIR POLLUTANTS

Air Pollutant &amp; CAS

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**Heraeus**

## Rh Furnace Source Emissions Summary

Source		PM <sub>Total</sub>		PM <sub>10f</sub>		PM <sub>2.5f</sub>		PM <sub>Cond</sub>		NO <sub>x</sub>		CO		SO <sub>2</sub>		VOC		CO <sub>2eq</sub>		Phosphorus	
Name	ESRN	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Rh Furnace	65-0049-09	0.21	0.09	1.29E-02	5.63E-02	1.29E-02	5.63E-02	8.36E-03	3.66E-02	0.13	0.56	0.07	0.32	1.37E-03	6.00E-03	76.25	73.22	--	644.96	0.19	9.36E-05

## Heraeus

### Rh Oil Process Emissions

Baghouse Control

Scrubber used for product collection

Operating hours	8,760	hr/yr
Annual Throughput	120.0	ton/yr
Annual Throughput	32,849	gal/yr <sup>1</sup>
Furnace Capacity	125	lb/hr
Furnace Capacity	17.1	gal/hr <sup>2</sup>

### VOC

Annual Throughput (TPY)	VOC Content <sup>5</sup>	VOC Emissions (lb/hr)	VOC Emissions (TPY)
120.0	61%	76	73.2

### PM & HAP (Phosphorus)

Annual Throughput (gal/yr)	Emission Factor <sup>3</sup> (lb per 10 <sup>3</sup> gal)	Uncontrolled Emissions (lb/hr)	Scrubber Control Efficiency	Baghouse Control Efficiency	Controlled PM & HAP Emissions (Phosphorus)	
					lb/hr	tpy
32849	1095	18.73	--	99%	1.9E-01	9.4E-05

Notes:

1. gal/yr = tons/yr \* 2000 / specific gravity (0.875) / density of water (8.34 lb/gal)

2. gal/hr = lbs/hr / specific gravity (0.875) / density of water (8.34 lb/gal)

3. Solids content of the material is primarily phosphorus, so the PM emission factor assumes all potential phosphorus content is emitted.

Emission factor: lb Phosphorus / 10<sup>3</sup> gallons = specific gravity (0.875) \* density of water (8.34 lb/gal) \* 1000 \* 15% phosphorus

The main components of the material are derived from butane, and butane PM emission factor from AP42 Table 1.5-1 is negligible.

4. Scrubber efficiency considered to be 97%; it is not included here because it is not included as control

5. VOC content based on Method 24 testing for 3 likely materials. Worst case VOC concentration used.

## Heraeus

## Rh Furnace

### Operating Parameters

Fuel Type	Natural Gas		
Maximum Firing Rate	0.90	MMBtu/hr	
Operating hours	8,760	hr/yr	Diesel heating value = 140,000 Btu/gal 1,047,200 Btu/ft <sup>3</sup>
Annual Fuel Usage	Natural Gas		Diesel
	7.7	MMCF	7.53E-03 MMCF
	882	scf/hr	56.31 10 <sup>3</sup> gal
			6.43 gal/hr

### Emission Calculations

#### Emission Factors for Natural Gas Combustion<sup>1,2</sup>

	lb/10 <sup>6</sup> scf	lb/MMBtu-HHV	
Particulate Matter (PM <sub>Total</sub> )	7.60	0.0075	AP-42
Particulate Matter (PM <sub>Cond</sub> )	5.70	0.0056	AP-42
Particulate Matter (PM <sub>Filter</sub> ) <sup>3</sup>	1.90	0.0019	AP-42
Nitrogen Oxides (NO <sub>x</sub> )	100.00	0.0980	AP-42
Carbon Monoxide	84.00	0.0824	AP-42
Sulfur Dioxide (SO <sub>2</sub> )	0.60	0.0006	AP-42
VOC	5.50	0.0054	AP-42
Carbon Dioxide (CO <sub>2</sub> )	119315.60	116.98	40 CFR 98 Table C-1
Methane (CH <sub>4</sub> )	2.25	2.205E-03	40 CFR 98 Table C-2
Nitrous Oxide (N <sub>2</sub> O)	0.22	2.205E-04	40 CFR 98 Table C-2

### Natural Gas Emissions

	lb/hr	Annual <sup>4,5</sup> ton/year
Particulate Matter (PM <sub>Total</sub> )	6.71E-03	2.94E-02
Particulate Matter (PM <sub>10f</sub> )	1.68E-03	7.34E-03
Particulate Matter (PM <sub>2.5f</sub> )	1.68E-03	7.34E-03
Particulate Matter (PM <sub>Cond</sub> )	5.03E-03	2.20E-02
Nitrogen Oxides (NO <sub>x</sub> )	0.09	0.39
Carbon Monoxide	0.07	0.32
Sulfur Dioxide (SO <sub>2</sub> )	5.29E-04	2.32E-03
Combustion VOC	4.85E-03	2.13E-02
Carbon Dioxide (CO <sub>2</sub> )	105.28	461.12
Methane (CH <sub>4</sub> )	1.98E-03	8.69E-03
Nitrous Oxide (N <sub>2</sub> O)	1.98E-04	8.69E-04
CO <sub>2</sub> Equivalent (CO <sub>2</sub> eq) <sup>8</sup>	--	461.60

GWP <sup>6</sup>	
CH4	25
N2O	298



## Rh Furnace

### Emission Factors for Diesel Combustion <sup>1</sup>

	<u>lb/10<sup>3</sup> gal</u>	<u>lb/MMBtu-HHV</u>		0.0015 %sulfur in fuel
Particulate Matter (PM <sub>Total</sub> )	3.3	2.36E-02	AP-42 Table 1.3-1	
Particulate Matter (PM <sub>Cond</sub> )	1.3	9.29E-03	AP-42 Table 1.3-2	
Particulate Matter (PM <sub>2.5Filter</sub> )	2	1.43E-02	AP-42 Table 1.3-1	
Particulate Matter (PM <sub>10Filter</sub> )	2	1.43E-02	AP-42 Table 1.3-1	
Nitrogen Oxides (NO <sub>x</sub> )	20	1.43E-01	AP-42 Table 1.3-1	
Carbon Monoxide	5	3.57E-02	AP-42 Table 1.3-1	
Sulfur Dioxide (SO <sub>2</sub> )	0.213	1.52E-03	AP-42 Table 1.3-1	
VOC	0.252	1.80E-03	AP-42 Table 1.3-3	
Carbon Dioxide (CO <sub>2</sub> )	--	163.05	40 CFR 98 Table C-1	
Methane (CH <sub>4</sub> )	--	6.61E-03	40 CFR 98 Table C-2	
Nitrous Oxide (N <sub>2</sub> O)	--	1.32E-03	41 CFR 98 Table C-2	

### Diesel Fuel Emissions

	<b>lb/hr</b>	<b>Annual <sup>2,3</sup> ton/year</b>
Particulate Matter (PM <sub>Total</sub> )	2.12E-02	0.09
Particulate Matter (PM <sub>10f</sub> )	1.29E-02	0.06
Particulate Matter (PM <sub>2.5f</sub> )	1.29E-02	0.06
Particulate Matter (PM <sub>Cond</sub> )	8.36E-03	0.04
Nitrogen Oxides (NO <sub>x</sub> )	0.13	0.56
Carbon Monoxide	0.03	0.14
Sulfur Dioxide (SO <sub>2</sub> )	1.37E-03	6.00E-03
Combustion VOC	1.62E-03	7.10E-03
Carbon Dioxide (CO <sub>2</sub> )	146.75	642.75
Methane (CH <sub>4</sub> )	5.95E-03	2.61E-02
Nitrous Oxide (N <sub>2</sub> O)	1.19E-03	5.21E-03
CO <sub>2</sub> Equivalent (CO <sub>2</sub> eq) <sup>5</sup>	--	644.96

GWP <sup>6</sup>	
CH4	25
N2O	298

## Rh Furnace

**Summary Table (Highest Emission Rate if either fuel is used)**

	lb/hr	ton/year
Particulate Matter (PM <sub>Total</sub> )	2.12E-02	9.29E-02
Particulate Matter (PM <sub>10f</sub> )	1.29E-02	5.63E-02
Particulate Matter (PM <sub>2.5f</sub> )	1.29E-02	5.63E-02
Particulate Matter (PM <sub>Cond</sub> )	8.36E-03	3.66E-02
Nitrogen Oxides (NO <sub>x</sub> )	0.13	0.56
Carbon Monoxide	0.07	0.32
Sulfur Dioxide (SO <sub>2</sub> )	1.37E-03	6.00E-03
Combustion VOC	4.85E-03	2.13E-02
Carbon Dioxide (CO <sub>2</sub> )	146.75	642.75
Methane (CH <sub>4</sub> )	5.95E-03	2.61E-02
Nitrous Oxide (N <sub>2</sub> O)	1.19E-03	5.21E-03
CO <sub>2</sub> Equivalent (CO <sub>2</sub> eq) <sup>8</sup>	--	644.96

### Example Calculations/Notes:

- (1) Compilation of Air Pollutant Emission Factors, AP-42, Supplement D, Fifth Edition, Section 1.4, Tables 1.4-1 and 1.4-2, July 1998, Small Boilers < 100 MMBtu/hr and AP-42, Supplement D, Fifth Edition, Section 1.3, May 2010
- (2) Per AP-42, Table 1.4-1 and 1.4-2, to convert from lb/10<sup>6</sup> scf to kg/10<sup>6</sup> m<sup>3</sup>, multiply by 16. To convert from lb/10<sup>6</sup> scf to lb/MMBtu, divide by 1,020.
- (3) Assume PM<sub>Filt</sub> = PM<sub>2.5</sub>, PM<sub>10</sub>
- (4) Maximum Emissions (lb/hr) = Emission Factor (lb/MMscf) \* Natural Gas Usage (MMCF) and  
Maximum Emissions (lb/hr) = Emission Factor (lb/10<sup>3</sup> gal) \* Diesel Fuel Usage (10<sup>3</sup> gal)
- (5) Annual Emissions (tpy) = Average Emissions (lb/hr) \* 8,760 (hr/yr) / 2,000 (lb/ton)
- (6) GWP from 40 CFR 98 Subpart A Table A-1; to convert kg/MMBtu to lb/MMBtu, multiply by 2.205
- (7) CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O Annual Emissions (tpy) = Average Emissions (lb/hr) \* 8,760 (hr/yr) / 2,000 (lb/ton)
- (8) CO<sub>2</sub> Equivalent (CO<sub>2</sub>eq) = CO<sub>2</sub>(t) + [GWP<sub>CH4</sub> \* CH<sub>4</sub> (t)] + [GWP<sub>N2O</sub> \* N<sub>2</sub>O (t)]



**TITLE V PERMIT APPLICATION  
 CURRENT EMISSIONS REQUIREMENTS AND STATUS**

**GENERAL IDENTIFICATION AND DESCRIPTION**

1. Facility name: <b>Heraeus Precious Metals North America, LLC</b>	2. Emission source number <b>65-0049-13</b>
3. Describe the process emission source / fuel burning installation / incinerator. <b>One Rhodium Oil Furnace with baghouse control</b>	

**EMISSIONS AND REQUIREMENTS**

4. Identify if only a part of the source is subject to this requirement	5. Pollutant	6. Applicable requirement(s): TN Air Pollution Control Regulations, 40 CFR, permit restrictions, air quality based standards	7. Limitation	8. Maximum actual emissions	9. Compliance status ( In/Out )
	Particulates	TAPCR 1200-3-07-.01(5)	0.30 lb/hr	0.09 lb/hr	IN
	VOC	TAPCR 1200-3-07-.07(2)	73.5 (TPY)	73.22 (TPY)	IN
	NOx	TAPCR 1200-3-07-.07(2)	0.13 (lb/hr)	0.13 (lb/hr)	IN
	SO2	TAPCR 1200-03-14-.01(3)	0.001 (lb/hr)	0.001 (lb/yr)	IN

10. Other applicable requirements (new requirements that apply to this source during the term of this permit)

<b>N/A</b>					

11. Page number:	Revision number:	Date of revision:
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