

Commonwealth of Kentucky
Division for Air Quality
STATEMENT OF BASIS / SUMMARY

Title V, Operating
PERMIT ID: V-25-003
Tokai Carbon GE LLC
2320 Myron Cory Drive
Hickman, KY 42050
January 15, 2025
Durga Patil, Permit Review Branch

Source ID: 21-075-00001
Agency Interest #: 1440
Activity ID: APE20240001

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SECTION 1 - SOURCE DESCRIPTION

SIC Code and description: 3624, Carbon and Graphite Products

Single Source Det. ☐ Yes ☒ No If Yes, Affiliated Source AI:

Source-wide Limit ☒ Yes ☐ No If Yes, See Section 4, Table A

28 Source Category ☐ Yes ☒ No If Yes, Category:

County: Fulton

Nonattainment Area ☒ N/A ☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☐ NO_x ☐ SO₂ ☐ Ozone ☐ Lead
If yes, list Classification:

PTE* greater than 100 tpy for any criteria air pollutant ☒ Yes ☐ No

If yes, for what pollutant(s)?

☐ PM₁₀ ☐ PM_{2.5} ☒ CO ☐ NO_x ☒ SO₂ ☐ VOC

PTE* greater than 250 tpy for any criteria air pollutant ☐ Yes ☒ No

If yes, for what pollutant(s)?

☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☐ NO_x ☐ SO₂ ☐ VOC

PTE* greater than 10 tpy for any single hazardous air pollutant (HAP) ☐ Yes ☒ No

If yes, list which pollutant(s):

PTE* greater than 25 tpy for combined HAP ☐ Yes ☒ No

*PTE does not include self-imposed emission limitations.

Description of Facility:

The primary activity of the Tokai Carbon GE LLC plant is the manufacturing of carbon graphite electrodes. This process consists of milling, mixing and extruding petroleum coke to make green electrodes that are then shipped to outside plants for completion.

The petroleum coke is weighed, sized, and pneumatically conveyed to a mixer/cooler pre-heater where it is heated and dropped into the mixer and homogenized. Liquid coal tar pitch and other additives are added to the mixer and blended until the desired target temperature is reached. Once temperature has been attained, a predetermined amount of water is added to reduce the hot mix to the desired extrusion temperature. After water addition, the cooled mix is then dropped to a press to be extruded. The electrodes are then ready for further processing. These are termed "green" electrodes.

A Ring Bake furnace at the plant allows the facility to bake the green electrodes on site. Following Ring Bake Furnace, the baked electrodes are further processed by Pitch Impregnation (PI) in autoclaves then baked in one of the two Carbottom Furnaces (CB).

SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM

Permit Number: V-25-003

Activity: APE20240001

Application Received: 3/12/2024

Application Complete: 1/15/2025

Permit Action: ☐ Initial ☒ Renewal ☐ Significant Rev. ☒ Minor Rev. ☐ Administrative

Construction/Modification Requested? ☐ Yes ☒ No NSR Applicable? ☐ Yes ☐ No

Previous 502(b)(10) or Off-Permit Changes incorporated with this permit action ☒ Yes ☐ No

Description of Action:

APE20220001: 502(b)(10) change: The application received January 5, 2022 requested change in the RTO control efficiency of VOC from 70% to 60% and a change in overall control efficiency from 97% to 96% at EU04 resulting with an increase of 1.64 tpy of PM/PM₁₀ and PM_{2.5} and increase in 1.64 tpy of VOC and an increase of 0.05 tpy of combined HAPs.

APE20230001: Minor Permit Revision: The application received December 4, 2023 was for the addition of a new 5 MMBtu/hr EU 28 New Terminol Natural Gas Heater. This will eventually replace EU 08 Terminol Natural Gas Heater subject to 401 KAR 61:015. Currently both the heaters are on site and operational. The emission factors for NO_x and CO emissions were provided from manufacturer specifications, and it is subject to 401 KAR 59:015 New Indirect Heat Exchangers and 401 KAR 63:020 Potentially hazardous matter or toxic substances.

APE20240001: Renewal: The application received March 12, 2024, requested the following changes: NO_x limit of 90 tpy; Change in Rated Capacity of EU 24 from 30 tons electrodes per batch to 27 tons electrodes per batch with the total batch time of 20 hours based on historical operational data. The facility also requested the incorporation of previous 502(b)(10) change and and minor permit revision. The facility also requested removal of IA-7 (cooling tower) as it was never installed and removal of bypass vent for the two carbottom electrode furnaces.

APE20240002: Minor Permit Revision: The application received August 14, 2024 is for the replacement of the 36 HP natural gas powered emergency generator EU 19 with a Generac 54 HP certified natural gas powered emergency generator EU 29, subject to 40 CFR 63, Subpart ZZZZ and 40 CFR 60, Subpart JJJJ.

V-25-003 Emission Summary				
Pollutant	2023 Actual (tpy)	Previous PTE V-18-055 R3 (tpy)	Change (tpy)	Revised PTE V-25-003 (tpy)
CO		215.75	19.36	235.11
NO _x		98.9	8.93	< 90*
PT		46.88*	1.8	48.68
PM ₁₀		46.30*	1.80	48.10
PM _{2.5}		31.62*	1.8	33.42
SO ₂		< 90*	N/A	< 90*
VOC		58.47	1.76	60.23
Lead		0	1.07E-5	1.07E-5
Greenhouse Gases (GHGs)				
Carbon Dioxide		51,491	2,586	54,077
Methane		0.43	0.054	0.484
Nitrous Oxide		0.17	0.049	0.219
CO ₂ Equivalent (CO ₂ e)		51,553	2,602	54,155
Hazardous Air Pollutants (HAPs)				
POM**		0.67	0.01	0.71
Combined HAPs:		0.68	0.05	0.73

*- Federally Enforceable Emission or Operational Limit

** - Polycyclic Organic Matter

Emission Unit 01 – Coke Unloading - Receiving				
EU 01 – Coke Unloading – Receiving EU 01-1 – Coke Unloading – Receiving (Fugitives) EU 01-2 – Coke Unloading – Coke Storage EU 01-3 – Coke Unloading – Coke Recycling				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	26.41 lbs/hr	401 KAR 59:010, Section 3(2)	All emission factors based on grain loading and engineering calculation	Manufacturer's guarantee
	Opacity Shall not exceed 20%	401 KAR 59:010, Section 3(1)(a)	0.196 lb/ton (EU 01)	Monitoring, Recordkeeping and Reporting, Method 9
			0.033 lb/ton (EU 01-2)	
			0.0003 lb/ton (EU 01-3)	
Initial Construction Date: 1/1/1990 Process Description: Raw carbon material is brought into the facility mainly by truck. This material is transported from the truck to a holding bin. The hopper is the initial conveying facility that operates in batch mode. The raw carbon is stored in silos until ready for use. Maximum Rated Capacity: 25 tons/hour (hr) or 219,000 tons/year (yr) each. Applicable Regulation: (Except EU 01-1) 401 KAR 59:010, New Process Operations. This regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975. (For EU 01-1) 401 KAR 63:010, Fugitive Emissions. Comments: Controlled by dust collector: DC-30-12, Coke Receiving – Railcar/Truck Hopper Baghouse, 0.002 gr/dscf DC-30-11, Coke Storage Baghouse, 0.002 gr/dscf DC-30-13, Coke Recycling Bin Vent, 0.002 gr/dscf Flow Rate: DC-30-12: 28,560 dscfm DC-30-11: 4,760 dscfm DC-30-13: 477 dscfm Emission factors for dust collectors calculated based on grain loading and assumed 90% control efficiency (PT & PM ₁₀). PM _{2.5} based off of 9.3% of PT. Emission Factors for fugitive emissions from AP-42 Chapter 11.19 for PT & PM ₁₀ . PM _{2.5} based off of 9.3% of PT. 70% control due to partially enclosed process.				

Emission Unit 02 – Particle Screening System				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	18.44 lbs/hr	401 KAR 59:010, Section 3(2)	All emission factors based on grain loading and engineering calculation	Manufacturer's guarantee
	Opacity shall not exceed 20%	401 KAR 59:010, Section 3(1)(a)	0.735 lb/ton (Particle Screening System) 0.006 lb/ton (Coke Receiving System)	Monitoring, Recordkeeping and Reporting, Method 9
<p>Initial Construction Date: 6/21/1995</p> <p>Process Description: Raw coke is screened and filtered to various particle sizes. The smallest screen mesh size for smaller particle fractions results in high particulate matter (PM) emissions. The larger mesh screens have insignificant emissions. Maximum Rated Capacity: 14 tons/hr or 122,640 tons/yr.</p> <p>Applicable Regulation: 401 KAR 59:010, New Process Operations. This regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975.</p> <p>Comments: Controlled by dust collector: DC-30-6, Particle Screening System Dust Collector, 0.004 gr/dscf DC-30-8, Coke Receiving Hopper Bin Vent, 0.002 gr/dscf Flow Rate: DC-30-6: 30,000 dscfm DC-30-8: 477 dscfm</p> <p>Emission factors calculated based on grain loading and assumed 90% control efficiency (PT & PM₁₀). PM_{2.5} based off of 9.3% of PT.</p>				

Emission Unit 03 – Storage Tanks

Initial Construction Date: 11/1/1998 (Coal Tar Pitch Tanks) 1/1/1966 (Extrusion Oil Tanks)

Process Description:

Coal tar pitch is stored on site. The tar pitch tanks are heated, using electric heaters, near 380°F to avoid solidification. The pitch transfer from railcar tankers or truck tankers requires a preheating of the mobile tank and piping lines. The piping lines are jacketed and heated with thermion, whereas the railcars and truck tanks are electrically heated.

A 17,000 gallon extrusion oil tank is also onsite, equipped with an electric heater to achieve a storage temperature of approximately 175°F. It supplies extrusion oil to the mixer.

Applicable Regulation:

401 KAR 60:005, Section 2.(2)(r), 40 C.F.R. 60.110b through 60.117b, (Subpart Kb), Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984. This regulation applies only to the Coal Tar Pitch Tanks. These tanks were constructed after July 23, 1984.

Note: 401 KAR 60:005, Section 2.(2)(bbb), 40 C.F.R. 60.480 through 60.489, (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006, as referenced by 40 CFR 60, Subpart Kb.

State-origin requirement:

401 KAR 63:020, Potentially hazardous matter or toxic substances applies where such emissions are not elsewhere subject to provisions of an administrative regulation of the Division for Air Quality.

Controls: Condenser

Comments:

Coal Tar Pitch Tanks:	2
Capacity:	50,000 gallons (each)
Throughput:	3,000 gallons/hr
Storage Temp:	Approx. 380°F
Heating Method:	Electric

Extrusion Oil Tanks:	1
Capacity:	17,000 gallons
Throughput:	3,000 gallons/hr
Storage Temp:	175°F
Heating Method:	Electric

Emission factors from EPA TANKS 4.0.9d.

Emission Unit 04 – Mixing and Extrusion System				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	26.41 lbs/hr Opacity Shall not exceed 20%	401 KAR 59:010, Section 3(2) 401 KAR 59:010, Section 3(1)(a)	1.4932 lbs/ton, Ozark Facility Stack Test, Engineering Calculations	Operation of control devices Monitoring, Recordkeeping and Reporting, Method 9

Initial Construction Date: 6/21/1995

Process Description:

Raw coke material is mixed with coal tar pitch, extrusion oil, stearic acid, iron oxide and water. The mixture is extruded through a die-mold. Maximum Rated Capacity: 25 tons/hr or 219,000 tons/yr.

Applicable Regulation:

401 KAR 50:012, General application (RAP). 50:012, Section 1(2) states “In the absence of a standard specified in these administrative regulations, all major air contaminant sources shall as a minimum apply control procedures that are reasonable, available and practical. This is a major source and has no applicable standards for the pollutant of concern (VOC).

401 KAR 59:010, New Process Operations. This regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975.

40 CFR 64, Compliance Assurance Monitoring (CAM). The unit uses a control device to achieve compliance with the PM limits of 401 KAR 59:010 and has a pre-control potential to emit of greater than 100 tons per year.

State-origin requirement:

401 KAR 63:020, Potentially hazardous matter or toxic substances applies where such emissions are not elsewhere subject to provisions of an administrative regulation of the Division for Air Quality.

Comments:

VOC is controlled by Regenerative Thermal Oxidizer (K-30-33) with heat input capacity of 1 mmBtu/hr. Emission factors for the Eirich Mixer calculated based on Ozark facility stack test and engineering calculations. RTO natural gas combustion emission factors based on 40 CFR 98 (CO₂, methane, & nitrous oxide) and AP-42 Chapter 1.4 (all others). PM/PM₁₀ is controlled by Wet Scrubber (K-30-32).

The Wet Scrubber for PM/PM₁₀ emissions are subject to CAM. The RTO used for control of VOC emissions is subject to RAP. The efficiencies requested in issuance of V-18-055 permit was RTO: 70% control efficiency for VOC control by the RTO and Wet Scrubber providing 90% control efficiency for PM and VOC control. The control devices are in series, with a combined control efficiency of 97% for VOC and PM.

Emission Unit 04 – Mixing and Extrusion System

However, these were updated under APE20220001 notification based on actual test results to RTO: 60% control efficiency for VOC control from RTO and Wet Scrubber providing 90% control efficiency for PM and VOC control. The control devices are in series, with a combined control efficiency of 96% for VOC and PM.

Emission Unit 05 – Baking Conveyor System Metallurgical Coke (Met Coke)

EU 05 – Baking Conveyor System (Met Coke)

EU 05-1 - Baking Conveyor System (Fugitives)

EU 05-2 - Baking Conveyor System

EU 05-3 – Baking Conveyor System - Met Coke Screening

Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	23.0 lbs/hr Opacity shall not exceed 20%	401 KAR 59:010, Section 3(2) 401 KAR 59:010, Section 3(1)(a)	EU 05: 0.0214 lb/ton EU 05-2: 0.36 lb/ton EU 05-3: 0.024 lb/ton All emission factors based on grain loading and engineering calculation N/A	Manufacturer's guarantee and operation of control device Monitoring, Recordkeeping and Reporting, Method 9

Initial Construction Date: EU 05, EU 05-1 and EU 05-2: 1982; EU 05-3: 2021

Process Description:

Raw coke is transported from storage bins (silos) to the transporter hoppers. Conveying and transport systems are used as needed. Maximum Rated Capacity: 20 tons/hr or 175,200 tons/yr, each.

Applicable Regulation:

401 KAR 59:010, This regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975.

401 KAR 63:010, Fugitive Emissions. (EU 05-1).

Comments:

Controlled by baghouse: K-92-48 – Baking – Met Coke System Baghouse, 0.004 gr/dscf
K-90-1 – Baking – Hartman Vacuum Baghouse, 0.004 gr/dscf
K-90-2 – Baking – Met Coke Screening Dust Collector, 0.002 gr/dscf

Flow Rate: K-92-48: 16,200 dscfm
K-90-1: 21,000 dscfm
K-90-2: 2,783 dscfm

Emission factors for units other than EU 05-1 are calculated based on grain loading and assumed 90% control efficiency (PT & PM₁₀). PM_{2.5} based off of 9.3% of PT. EU 05-3 is being added as part of APE20200001. The screener is enclosed and under negative pressure to maximize capture efficiency of K-90-2.

Emission Unit 06 – Electrode Cleaning Machine				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	25.2 lbs/hr Opacity shall not exceed 20%	401 KAR 59:010, Section 3(2) 401 KAR 59:010, Section 3(1)(a)	0.686 lb/ton, Grain Loading & Engineering Calculations	Manufacturer's guarantee Monitoring, Recordkeeping and Reporting, Method 9
Initial Construction Date: 7/1969 Modified: 6/2005 Process Description: Baked electrodes come out of the Ring Bake furnace and must be cleaned, before shipping, using the cleaning machine. Carbon chips that are loosely associated with the electrodes, are scraped off and recycled back through the vacuum system. Maximum Rated Capacity: 15 tons/hr or 32,500 tons/yr. Applicable Regulation: 401 KAR 59:010, This regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975. Comments: Controlled by baghouse: K-90-30 – Electrode Cleaning Baghouse, 0.004 gr/dscf Flow Rate: K-90-30: 30,000 dscfm Emission factors calculated based on grain loading and assumed 90% control efficiency (PT & PM ₁₀). PM _{2.5} based off of 9.3% of PT.				

Emission Unit 07 – Ring Bake Furnace				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	8.47 lbs/hr* Opacity shall not exceed 20%	401 KAR 59:010, Section 3(2) 401 KAR 59:010, Section 3(1)(a)	20.27 lb/ton: 12/04 Stack Test, engineering calculation	Emission Factors & ESP Control Monitoring, Recordkeeping and Reporting, Method 9
H ₂ S	H ₂ S not to exceed ten (10) grains per 100 dscf (165 ppm _v) at 0% O ₂	401 KAR 59:105, Section 3	0.99 lb/ton, mass balance	Analysis of the sulfur content of the green and baked electrodes and calculations of H ₂ S emissions from the baking process
*-Process weight based on 35,000 tons per year/8760 hours of operation per year = 3.995 tons/hr. Initial Construction Date: 1/30/1981, Modified: 6/2001				

Emission Unit 07 – Ring Bake Furnace

Process Description:

Molded graphite carbon anodes are lowered in to a ring bake furnace for firing. Operates in batch mode. Carbon chips are dumped into the furnace units for electrode support. When natural gas is fired, the electrodes are heated anywhere from 17 to 24 days. There are 22 furnace shells, so a single shell is emptied while another is filled on each day, approximately. Maximum Rated Capacity: 35,000 tons/yr.

Applicable Regulation:

401 KAR 59:010, This regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975.

PM Standard = $3.59(P)^{0.62}$ lbs/hr. P = process weight rate in tons/hr.

401 KAR 59:105, New process gas streams applies to any process gas stream which is not elsewhere subject to a standard of performance within this chapter with respect to hydrogen sulfide.

40 CFR 64, CAM. The unit uses a control device to achieve compliance with the PM limits of 401 KAR 59:010 and has a pre-control potential to emit of greater than 100 tons per year.

Precluded Regulation:

401 KAR 59:105, New process gas streams, Section 4. (SO₂)

State-origin requirement:

401 KAR 63:020, Potentially hazardous matter or toxic substances applies where such emissions are not elsewhere subject to provisions of an administrative regulation of the Division for Air Quality.

Comments:

Controlled by Electrostatic Precipitators (ESPs): K-90-27A & B with 97.30% control efficiency.

The ESPs for PM emissions are subject to CAM.

Emission factors for PM from electrode baking calculated based on 12/04 stack test at the Hickman facility. The CO emission factor is based on stack testing at the Ozark, Arkansas facility, and the SO₂ factor from electrode baking is based on sulfur analysis from the Ozark, Arkansas facility. HAP emission factors from electrode baking based on stack test results from Chedde, France facility. Natural gas combustion emission factors based on 40 CFR 98 (GHG) and AP-42 Chapter 1.4 (all others).

The permit V-18-055 had a one-time test to verify the emission factor for PM and SO₂. However, since the uncontrolled PTE emissions of PM is greater than 250 tpy and the ESP is required to be in operation for compliance with 401 KAR 59:010, the Division has added during this renewal process, a testing requirement, to determine PM emission factor and control efficiency, within 180 days of issuance of V-25-003 permit and every 5 years thereafter.

Emission Unit 08 – Therminol Natural Gas Heater				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	0.56 lb/MMBtu	401 KAR 61:015, Section 4(1)(a)	7.6 lbs/mmscf; AP-42 Chapter 1.4, Table 1.4-2	Assumed based upon natural gas combustion
	Opacity shall not exceed 20%	401 KAR 61:015, Section 4(1)(b)		
SO ₂	6.0 lbs/MMBtu	401 KAR61:015, Section 5(1)	0.6 lb/mmscf; AP-42 Chapter 1.4, Table 1.4-2	
Initial Construction Date: 1966				
Process Description: Natural gas fired heater providing process heat to Pitch Tanks, Mixing, and Extrusion using Therminol as the heat transfer medium.				
Maximum Rated Capacity: 6.1 MMBtu/hr.				
Applicable Regulation: 401 KAR 61:015, Existing indirect heat exchangers.				
State-origin requirement: 401 KAR 63:020, Potentially hazardous matter or toxic substances applies to each affected facility which emits or may emit potentially hazardous matter or toxic substances as defined in Section 2 of 401 KAR 63:020, provided such emissions are not elsewhere subject to the provisions of the administrative regulations of the Division.				
Comments: All emission factors are from AP-42 Chapter 1.4, Table 1.4-2 with the exception of NO _x and CO which are from Table 1.4-1.				
*Pursuant to 401 KAR 61:015, Existing indirect heat exchangers, Section 4(1)(b), opacity shall not exceed 20% because Fulton County is located in a Priority I Region as defined by 401 KAR 50:020, Section (1)8.				

Emission Unit 09 – Cleaver Brooks Extrusion Pond Natural Gas Heater				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	0.56 lb/MMBtu	401 KAR 59:015, Section 4(1)(a)	7.6 lbs/mmscf; AP-42 Chapter 1.4, Table 1.4-2	Assumed based upon natural gas combustion
	Opacity shall not exceed 20%.	401 KAR 59:015, Section 4(1)(a)		
SO ₂	3.0 lbs/MMBtu	401 KAR 59:015, Section 5(1)(a)	0.6 lb/mmscf; AP-42 Chapter 1.4, Table 1.4-2	
<p>Initial Construction Date: 1997</p> <p>Process Description: Natural Gas fired heater providing process heat to the Cooling Pond. Maximum Rated Capacity: 2.5 MMBtu/hr</p> <p>Applicable Regulation: 401 KAR 59:015, New indirect heat exchangers.</p> <p>State-origin requirement: 401 KAR 63:020, Potentially hazardous matter or toxic substances applies to each affected facility which emits or may emit potentially hazardous matter or toxic substances as defined in Section 2 of 401 KAR 63:020, provided such emissions are not elsewhere subject to the provisions of the administrative regulations of the Division.</p> <p>Comments: All emission factors are from AP-42 Chapter 1.4, Table 1.4-2 with the exception of NO_x and CO which are from Table 1.4-1.</p>				

Emission Unit 10 – Apache ESP Cleaning Steam Natural Gas Boiler				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	0.51 lb/MMBtu	401 KAR 59:015, Section 4(1)(a)	7.6 lbs/mmscf; AP-42 Chapter 1.4, Table 1.4-2	Assumed based upon natural gas combustion
	Opacity shall not exceed 20%	401 KAR 59:015, Section 4(1)(a)		
SO ₂	2.55 lbs/MMBtu	401 KAR 59:015, Section 5(1)(c)	0.6 lb/mmscf; AP-42 Chapter 1.4, Table 1.4-2	
Initial Construction Date: 1982				
Process Description: Natural gas fired boiler used to clean ESP Units. Maximum Rated Capacity: 6.3 MMBtu/hr.				
Applicable Regulation: 401 KAR 59:015, New indirect heat exchangers.				
State-origin requirement: 401 KAR 63:020, Potentially hazardous matter or toxic substances applies where such emissions are not elsewhere subject to provisions of an administrative regulation of the Division for Air Quality.				
Comments: All emission factors are from AP-42 Chapter 1.4, Table 1.4-2 with the exception of NO _x and CO which are from Table 1.4-1.				

Emission Unit 21 – Process Heater for Pitch Impregnation Autoclaves (A&B)				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	0.42 lb/MMBtu	401 KAR 59:015, Section 4(1)(c)	7.6 lbs/mmscf; AP-42 Chapter 1.4, Table 1.4-2	Assumed based upon natural gas combustion
	Opacity shall not exceed 20%.	401 KAR 59:015, Section 4(2)		
SO ₂	1.83 lbs/MMBtu	401 KAR 59:015, Section 5(1)(c)	0.6 lb/mmscf; AP-42 Chapter 1.4, Table 1.4-2	
Initial Construction Date: 1/8/2021				
Maximum Capacity: 8.0 MMBtu/hr				
Process Description: Pitch Impregnation (PI) Process Thermal Oil Heater (Thermal Oil Heating Medium) provides heat for the PI Autoclaves.				
Applicable Regulation: 401 KAR 59:015, New indirect heat exchangers.				
State-origin Requirement: 401 KAR 63:020, Potentially hazardous matter or toxic substances applies where such emissions are not elsewhere subject to provisions of an administrative regulation of the Division for Air Quality.				
Comments: Natural gas combustion emission factors based on 40 CFR 98 (GHG) and AP-42 Chapter 1.4, Table 1.4-2 (all others) with the exception of NO _x and CO which are from Table 1.4-1.				

Emission Unit 22 – Process Heater for Pitch Tanks				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	0.42 lb/MMBtu Opacity shall not exceed 20%	401 KAR 59:015, Section 4(1)(c) 401 KAR 59:015, Section 4(2)	7.6 lbs/mmscf; AP-42 Chapter 1.4, Table 1.4-2	Assumed based upon natural gas combustion
SO ₂	1.83 lbs/MMBtu	401 KAR 59:015, Section 5(1)(c)	0.6 lb/mmscf; AP-42 Chapter 1.4, Table 1.4-2	
Initial Construction Date: 1/15/2021				
Maximum Capacity: 2.4 mmBtu/hr				
Process Description: Natural gas fired heater for the Petroleum Pitch and Coal Tar Pitch tanks (23,000 gallons each) (Thermal Oil Heating Medium).				
Applicable Regulation: 401 KAR 59:015, New indirect heat exchangers.				
State-origin requirement: 401 KAR 63:020, Potentially hazardous matter or toxic substances applies where such emissions are not elsewhere subject to provisions of an administrative regulation of the Division for Air Quality.				
Comments: Natural gas combustion emission factors based on 40 CFR 98 (GHG) and AP-42 Chapter 1.4, Table 1.4-2 (all others) with the exception of NO _x and CO which are from Table 1.4-1.				

Emission Unit 23 – Process Preheater for Electrodes				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	0.42 lb/MMBtu	401 KAR 59:015, Section 4(1)(c)	7.6 lbs/mmscf; AP-42 Chapter 1.4, Table 1.4-2	Assumed based upon natural gas combustion
	Opacity shall not exceed 20%	401 KAR 59:015, Section 4(2)		
SO ₂	1.83 lbs/MMBtu	401 KAR 59:015, Section 5(1)(c)	0.6 lb/mmscf; AP-42 Chapter 1.4, Table 1.4-2	
Initial Construction Date: 5/28/2021				
Maximum Capacity: 8.0 mmBtu/hr				
Process Description: Natural gas fired heater used to preheat electrodes before entering the PI Autoclaves (A & B).				
Applicable Regulation: 401 KAR 59:015, New indirect heat exchangers.				
State-origin Requirement: 401 KAR 63:020, Potentially hazardous matter or toxic substances applies where such emissions are not elsewhere subject to provisions of an administrative regulation of the Division for Air Quality.				
Comments: Natural gas combustion emission factors based on 40 CFR 98 (GHG) and AP-42 Chapter 1.4, Table 1.4-2 (all others) with the exception of NO _x and CO which are from Table 1.4-1.				

Emission Unit 28 – New Therminol Natural Gas Heater				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	0.41 lb/MMBtu	401 KAR 59:015, Section 4(1)(c)	7.6 lbs/mmescf; AP-42 Chapter 1.4, Table 1.4-2	Assumed based upon natural gas combustion
	Opacity shall not exceed 20%	401 KAR 59:015, Section 4(2)		
SO ₂	1.73 lbs/MMBtu	401 KAR 59:015, Section 5(1)(c)	0.6 lb/mmescf; AP-42 Chapter 1.4, Table 1.4-2	
Initial Construction Date: 12/2023				
Process Description: Natural gas fired indirect heat exchanger providing process heat to Pitch Tanks, Mixing, and Extrusion using Therminol as the heat transfer medium. Maximum Rated Capacity: 5.0 MMBtu/hr				
Applicable Regulation: 401 KAR 59:015, New indirect heat exchangers.				
State-origin requirement: 401 KAR 63:020, Potentially hazardous matter or toxic substances applies where such emissions are not elsewhere subject to provisions of an administrative regulation of the Division for Air Quality.				
Comments: Emission factors for NO _x and CO are based on manufacturer’s specifications (converted from PPM). All other emission factors are from AP-42 Chapter 1.4.				

Emission Unit 15 – Green Scrap and Stearic Acid System				
EU 15 – Green Scrap and Stearic Acid System EU 15-1 – Green Scrap and Stearic Acid System EU 15-2 – Green Scrap and Stearic Acid System				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	16.76 lbs/hr Opacity shall not exceed 20%	401 KAR 59:010, Section 3(2) 401 KAR 59:010, Section 3(1)(a)	EU 15: 0.0354 lb/ton, Grain Loading & Engineering Calculations	Manufacturer's guarantee Monitoring, Recordkeeping and Reporting, Method 9
Initial Construction Date: 1966, Modified: 6/21/1995, EU 15-2 Modified: 2014 Process Description: Off spec electrodes are broken up then crushed in the green scrap crusher. The material is then classified before being sent to bins. From the bins, the material is sent to the Mixing and Extrusion system. Stearic acid is unloaded into hoppers before being sent to the Mixing and Extrusion system. Conveying and transport systems are used as needed. Maximum Rated Capacity: 12 tons/hr or 105,120 tons/yr. Applicable Regulation: 401 KAR 59:010, This regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975. Comments: Bin Vent Filter: DC-30-7 – Green Scrap Receiving Hopper Bin Vent, 0.002 gr/dscf Bin Vent Filter DC-30-9 – Stearic Acid Receiving Hopper Bin Vent, 0.002 gr/dscf Bin Vent Filter DC-30-10 – Green Scrap Recycling Bin Vent, 0.02 gr/dscf Baghouse DC-30-15 – Green Scrap Baghouse, 0.002 gr/dscf Flow Rate: DC-30-7: 253 dscfm DC-30-9: 253 dscfm DC-30-10: 253 dscfm DC-30-15: 22,000 dscfm Emission factors calculated based on grain loading and assumed 90% control efficiency (PT & PM ₁₀). PM _{2.5} based off of 9.3% of PT. The permittee shall conduct weekly visual observation of emissions from each control device.				

Emission Unit 16 – End Milling Machine				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	3.00 lbs/hr Opacity Shall not exceed 20%	401 KAR 59:010, Section 3(2) 401 KAR 59:010, Section 3(1)(a)	1.5543 lb/ton, Grain Loading & Engineering Calculations	Manufacturer's guarantee Monitoring, Recordkeeping and Reporting, Method 9
<p>Initial Construction Date: 2/18/2013</p> <p>Process Description: Green electrodes from the mixing and extrusion process are processed through the End Milling Machine where both ends of the electrode are milled simultaneously to produce a smooth, flat end surface. Chips produced by the end milling are collected on a conveyor below the machine heads and smaller particles from the milling process are collected in a dust collector. Both collected materials are combined and routed on the chip conveyor to a bulk bagging station. Maximum Rated Capacity: 0.75 tons/hr or 999 tons/yr.</p> <p>Applicable Regulation: 401 KAR 59:010, This regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975.</p> <p>Comments: Controlled by baghouse: DC-30-14 – End Milling Baghouse, 0.002 gr/dscf Flow Rate: DC-30-14: 6,800 dscfm</p> <p>Emission factors calculated based on grain loading and assumed 90% control efficiency (PT & PM₁₀). PM_{2.5} based off of 9.3% of PT. The permittee shall conduct weekly visual observation of emissions from each control device.</p>				

Emission Unit 17 – Coke Flour Mill				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	10.90 lbs/hr Opacity shall not exceed 20%	401 KAR 59:010, Section 3(2) 401 KAR 59:010, Section 3(1)(a)	0.0343 lb/ton, Grain Loading & Engineering Calculations	Manufacturer's guarantee Monitoring, Recordkeeping and Reporting, Method 9
<p>Initial Construction Date: 1/1/1966, Modified: 1995</p> <p>Process Description: Over-sized coke particles from the Coke Particle Sizing System are milled and returned to the process. Maximum Rated Capacity: 6 tons/hr; 52,560 tons/yr.</p> <p>Applicable Regulation: 401 KAR 59:010, This regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975.</p> <p>Comments: Controlled by Baghouse: DC-30-5, Coke Flour Milling Baghouse, 0.002 gr/dscf Flow Rate: DC-30-5: 1,200 dscfm</p> <p>Emission factors calculated based on grain loading and assumed 90% control efficiency (PT & PM₁₀). PM_{2.5} based off of 9.3% of PT. The permittee shall conduct weekly visual observation of emissions from each control device.</p>				

Emission Unit 12 – Caterpillar Emergency Generator	
<p>Initial Construction Date: See below.</p> <p>Process Description: Provides emergency electrical power to the extrusion process in the event of loss of commercial power.</p> <p>Applicable Regulation: 401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.</p> <p>Comments: Make: Caterpillar Fuel: Diesel Power: 217 HP Manufacture Date: 1/1987 Install Date: 11/2004 (Engine previously at another site in Canada)</p> <p>Emission factors from 40 CFR 98 (CO₂, methane, nitrous oxide), and AP-42 Chapter 3.3 (all others).</p>	

Emission Unit 18 – Kohler Natural Gas Emergency Generator

Initial Construction Date: See below.

Process Description:

Provides emergency power in the event of a loss of commercial power.

Applicable Regulation:

401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

Comments:

Make: Kohler Model: 60RZG Serial No: 2231613

Fuel: Natural Gas

Type: 4SLB

Power: 105 HP

Manufacture Date: 11/2008 Install Date: 11/2016

Emission factors from 40 CFR 98 (nitrous oxide), manufacturer specifications (NO_x, CO, VOC), and AP-42 Chapter 3.2.

Pursuant to 40 CFR 63.6590(a)(2)(iii), this engine is considered “new”. Pursuant to 40 CFR 63.6590(c)(1), a new or reconstructed stationary RICE at an area source meets the requirements of 40 CFR 63, Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart JJJJ for spark ignition engines. Pursuant to 40 CFR 60.4230(a)(4)(iv), emergency engines are only subject to 40 CFR 60, Subpart JJJJ if they are manufactured on or after January 1, 2009. Therefore the engine is not subject to any requirements in 40 CFR 60, Subpart JJJJ.

Emission Unit 29 – Generac Natural Gas Emergency Generator				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor (lbs/mmcf) Used and Basis	Compliance Method
NO _x + HC CO and PM	NO _x + HC 10 g/hp-hr CO 387 g/hp-hr	40 CFR 60.4233(d), Table 1	NO _x : 2,245.36 CO: 3,779.52 VOC: 30.07; Manufacturer Specifications PM, PM ₁₀ , PM _{2.5} : 10.14 SO ₂ : 0.60 AP-42 Chapter 3.2	Engine Certified to emission limits
<p>Initial Construction Date: See below.</p> <p>Process Description: Provides emergency power in the event of a loss of commercial power.</p> <p>Applicable Regulation: 401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. 401 KAR 60:005, Section 2(2)(eeee) 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.</p> <p>Comments: Make: Generac; Fuel: Natural Gas Type: 4SRB; Power: 36 HP Manufacture Date: 7/2024 Install Date: 10/2024 Engine Family: RGNXB04.5MDI; Certificate Number: RGNXB04.5MDI-040</p> <p>This unit was installed in place of EU 19, which was removed from service in October 2024.</p>				

Emission Unit 20 – Diesel Emergency Generator				
Pollutant	Emission Limit or Standard (g/KW-hr)	Regulatory Basis for Emission Limit or Standard	Emission Factor Used (lbs/1000 gallon) and Basis	Compliance Method
NMHC+NO _x CO and PM	NMHC+NO _x : 6.4 CO: 3.5 PM: 0.2	40 CFR 60, Subpart III, 40 CFR 89.112	NO _x : 181.74 CO: 48.18 VOC: 15.45 PM, PM ₁₀ , PM _{2.5} : 3.78; Manufacturer Specifications	Engine Certified to emission limits
<p>Initial Construction Date: See below.</p> <p>Process Description: Emergency Generator: Generac Industrial Engine: Perkins Model year: 2019 Construction Date: 8/26/2021 Power output: 762 bhp Displacement: 2.53 liters per cylinder Primary fuel: Diesel Certified diesel generator engine that supplies emergency power to the PI Process</p> <p>Applicable Regulation: 401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. 401 KAR 60:005, Section 2(2)(dddd), 40 C.F.R. 60.4200 through 60.4219, Tables 1 through 8, (Subpart IIII), Standards of Performance for Stationary Compression Ignition Internal Combustion Engines applies to new compression ignition internal combustion engines (CI ICE).</p> <p>Comments: Emission factors from 40 CFR 98 (CO₂, methane, nitrous oxide), AP-42 Chapter 3.3-2 (HAP). CO, NO_x, PM and VOC factors are from the vendor. SO₂ emissions are based on diesel sulfur content of 15 ppm.</p>				

Emission Unit 14 – Gasoline Refueling Tank
<p>Initial Construction Date: 1/1/1990</p> <p>Process Description: Horizontal above ground gasoline storage tank for plant equipment.</p> <p>Applicable Regulation: 401 KAR 63:002, Section 2.(4)(ddddd), 40 C.F.R. 63.11110 through 63.11132, Tables 1 through 3 (Subpart CCCCCC), National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities. Pursuant to 40 CFR 63.11111, this regulation is applicable because the tank is part of a Gasoline dispensing facility (GDF) located at an area source of HAP.</p>

Emission Unit 14 – Gasoline Refueling Tank

Pursuant to 40 CFR 63.11132, GDF means any stationary facility which dispenses gasoline into the fuel tank of a motor vehicle, motor vehicle engine, non-road vehicle, or non-road engine, including a non-road vehicle or non-road engine used solely for competition. These facilities include, but are not limited to, facilities that dispense gasoline into on- and off-road, street, or highway motor vehicles, lawn equipment, boats, test engines, landscaping equipment, generators, pumps, and other gasoline-fueled engines and equipment.

Comments:

Type: Horizontal Above Ground
Capacity: 250 gallons Throughput: 3,500 gal/year
Contents: Gasoline
Emission factors from Tanks 4.0.9d.

Emission Unit 24 – Electrode Pitch Impregnation Process

Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	4.63 lbs/hr* Opacity Shall not exceed 20%	401 KAR 59:010, Section 3(2) 401 KAR 59:010, Section 3(1)(a)	0.034563 lb/ton: Ozark Sister Facility Stack Test	Monitoring, Recordkeeping and Reporting, Method 9

*-Process weight based on 30 tons per batch/20hrs = 1.5 tons/hr.

Initial Construction Date: 3/26/2021, Start-up date: 8/4/2021

Maximum Capacity: 27 metric tons electrodes per batch. Total batch time is 20 hours.

Process Description:

The PI Process is composed of a railcar/truck pitch unloading station, two 23,000 gallon pitch (petroleum/coal tar) storage tanks, two Autoclaves (A&B) for the actual pitch impregnation, an electrode preheater (EU-23) and four small pitch reservoirs(2)/holding tanks(2) of 305 gallons each. There is a cooling tank to cool the impregnated electrodes. The 2,000 gallon pitch storage tanks and autoclaves are heated with thermal oil (EU 22(tanks) and EU 23(autoclaves) respectively). The thermal oil systems and electrode preheater use natural gas as fuel. Any emissions from pitch unloading, storage tanks, autoclaves, pitch reservoirs/holding tanks and cooling tank are vented to the PI TO. Also, there is a cooling tower (IA 6) associated with this process. The tower has a 0.020% drift mist eliminator.

Applicable Regulations:

401 KAR 50:012, General application (RAP). 401 KAR 50:012, Section 1(2) states “In the absence of a standard specified in these administrative regulations, all major air contaminant sources shall as a minimum apply control procedures that are reasonable, available and practical. This is a major source and, with the exception of the pitch storage tanks, has no applicable standards for the pollutant of concern (VOC).

Emission Unit 24 – Electrode Pitch Impregnation Process

401 KAR 59:010, New Process Operations. This regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975.

PM Standard = $3.59(P)^{0.62}$ lbs/hr. P = process weight rate in tons/hr.

Applicable Regulations for the Coal Tar Pitch Tank and Petroleum Pitch Tank (23,000 gallons each) pitch tanks:

401 KAR 60:005, Section 2.(2)(r), 40 C.F.R. 60.110b through 60.117b, (Subpart Kb), Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984. These tanks were constructed after July 23, 1984. Coal Tar Pitch Tank and Petroleum Pitch Tank (23,000 gallons, each)

Note: 401 KAR 60:005, Section 2.(2)(bbb), 40 C.F.R. 60.480 through 60.489, (Subpart VV), Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006, as referenced by 40 CFR 60, Subpart Kb. Coal Tar Pitch Tank and Petroleum Pitch Tank (23,000 gallons, each)

State-origin requirement:

401 KAR 63:020, Potentially hazardous matter or toxic substances applies where such emissions are not elsewhere subject to provisions of an administrative regulation of the Division for Air Quality.

Precluded Regulation:

401 KAR 59:105, New process gas streams, Section 4. (SO₂)

Comments:

Two Pitch Tanks:

Capacity: 23,000 gallons (each)

Throughput: 8,400 gallons/hr (each)

Storage Temp: Approx. 350°F

Heating Method: Natural Gas (2.4 mmBtu/hr indirect heat exchanger EU 22)

Control: Thermal Oxidizer: 10 mmBtu/hr Burner Rating

Emissions factors for the combustion of natural gas and process emissions in the PI process and TO#1 are based on stack test results from the Ozark, Arkansas and Hickman, Kentucky facilities.

During the renewal application APE20240001, the facility updated the maximum rated capacity of EU 24 from 30 tons electrodes per batch to 27 metric tons electrodes per batch with the total batch time of 20 hours based on historical operational data.

Emission Unit 25, 26 – Two Carbottom Electrode Furnaces				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
H ₂ S	H ₂ S not to exceed ten (10) grains per 100 dscf (165 ppm _v) at 0% O ₂	401 KAR 59:105, Section 3	0.0002 lb/ton, Mass Balance	Analysis of sulfur content of the green and baked electrodes and calculations of H ₂ S emissions from the baking process
PM	13.28 lbs/hr* (Both Furnaces and Roof Top Vent) Opacity shall not exceed 20%	401 KAR 59:010, Section 3(2), 401 KAR 59:010, Section 3(1)(a)	0.0049 lb/ton, Ozark Sister Facility Stack Test	Assumed based on information in application and Monitoring, Recordkeeping and Reporting for opacity
SO ₂	< 90 tpy (sourcewide)	52:020, Section 10	5.49 lb/ton, electrode sulfur analysis	Initial stack testing and continuously by analysis of sulfur content of the green and baked electrodes and calculations of SO ₂ emissions from the baking process

*-Process weight based on 660 tons per batch/80hrs = 8.25 tons/hr.

Initial Construction Date: 5/2021;

Start-up Date: 9/7/2021 (EU 25); 10/25/2021 (EU26)

Maximum Capacity: 660 tons electrodes per batch (both furnaces). Total batch cycle time is 80 hours.

Process Description:

Pitch Impregnated electrodes are loaded onto furnace cars that can be moved into and sealed in the furnaces. These furnaces are fired with natural gas. After baking and during cool down, the furnaces are deluged with water to cool the electrodes. During operation when the furnace temperature is above 300 °C, the furnaces each exhaust to a dedicated TO for destruction of VOC that is driven from the pitch.

Applicable Regulations:

401 KAR 50:012, General application (RAP). 50:012, Section 1(2) states “In the absence of a standard specified in these administrative regulations, all major air contaminant sources shall as a minimum apply control procedures that are reasonable, available and practical. This is a major source and has no applicable standards for the pollutant of concern (VOC).

401 KAR 59:010, New process operations, this regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975.

PM Standard = $3.59(P)^{0.62}$ lbs/hr. P = process weight rate in tons/hr.

401 KAR 59:105, New process gas streams, applies to any process gas stream which is not elsewhere subject to a standard of performance within this chapter with respect to hydrogen sulfide.

Emission Unit 25, 26 – Two Carbottom Electrode Furnaces

State-origin requirement:

401 KAR 63:020, Potentially hazardous matter or toxic substances applies where such emissions are not elsewhere subject to provisions of an administrative regulation of the Division for Air Quality.

Precluded Regulation:

401 KAR 59:105, New process gas streams, Section 4. (SO₂)

Comments:

Each Carbottom Furnace is controlled by its own TO (TO#2 and TO#3) each with a Burner Rating of 8.5 mmBtu/hr.

Note: Emissions factors for the combustion of natural gas and process emissions in the Carbottom Furnaces and TO#2 and TO#3 are based on stack test results from the Ozark, Arkansas and Hickman, Kentucky facilities.

No data is available for roof stack PM emissions. Conservatively assumed to be double the emissions from the stack tests conducted on the TOs as mentioned above.

Emission Unit 27 – Caterpillar C18 Fire Pump Engine

Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
NMHC + NO _x	6.4 g/KW-hr (4.8 g/hp-hr)	40 CFR 60.4205(c)	NO _x : 197.9 lb/1,000 gallons; manufacturer's specifications	Purchase a certified engine
CO	3.5 g/KW-hr (2.6 g/hp-hr)	40 CFR 60.4205(c)	41.1 lb/1,000 gallons; manufacturer's specifications	
PM	0.2 g/KW-hr (0.15 g/hp-hr)	40 CFR 60.4205(c)	4.31 lb/1,000 gallons; manufacturer's specifications	

Initial Construction Date: 11/2021

Process Description:

Diesel driven pump engine used to supply firewater during emergencies.
Maximum Rated Capacity: 800 hp

Applicable Regulation:

401 KAR 63:002, Section 2.(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1A to 8 and Appendix A, (Subpart ZZZZ), National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

401 KAR 60:005, Section 2.(2)(dddd), 40 C.F.R. 60.4200 through 60.4219, Tables 1 through 8, (Subpart IIII), Standards of Performance for Stationary Compression Ignition Internal Combustion Engines applies to new compression ignition internal combustion engines (CI ICE).

Emission Unit 27 – Caterpillar C18 Fire Pump Engine
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Comments:

Emission factors for NO _x , CO, and PM are based on manufacturer's specifications. The nitrous oxide emission factor is from 40 CFR Part 98, and all other emission factors are from AP-42 Chapter 3.4.
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SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS (CONTINUED)

Testing Requirements/Results.

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
EU 04	Wet Scrubber	Particulate	401 KAR 52:020, Section 10	Within 180 days of startup of RCO, then every 5 years	Method 5	21.3 lb/hr	0.112 lb/hr	17.7 ton/hr	CMN2011 0002	3/8 - 3/9/2011
	Regenerative Catalytic Oxidizer	VOC Dest. Eff. %			Method 25A	N/A	75.30%			
EU 04	Wet Scrubber	Particulate		Every 5 years	Method 5	20.02 lb/hr	0.517 lb/hr	16.19 ton/hr	CMN2016 0001	4/21/2016
	Regenerative Catalytic Oxidizer	VOC Dest. Eff. %			Method 25A	N/A	46.32%			
EU 04	Wet Scrubber	Particulate		Every 5 years	Method 5	20.86 lb/hr	0.048 lb/hr	Process rate: 34624 lb/hr Temp. established: 1410°F	CMN2017 0001	8/1/2017
	Regenerative Thermal Oxidizer (RTO)	VOC Dest. Eff. %			Method 25A	N/A	70.24%			
EU 04	Wet Scrubber	Particulate		Every 5 years	Method 5	20.79 lb/hr	0.040 lb/hr	Process rate: 34455 lb/hr Temp. established: 1450°F	CMN2021 0001	7/20/2021
	(RTO)	VOC Dest. Eff. %			Method 25A	N/A	63.85%			
EU 04	Wet Scrubber	Particulate		Every 5 years	Method 5	TBD	TBD	TBD	TBD	TBD
	(RTO)	VOC Dest. Eff. %			Method 25A	TBD	TBD			

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
EU 07	Two Electrostatic Precipitator, K-90-27A & B None	PM EF and control efficiency	401 KAR 52:020, Section 10	Within 180 days of issuance of the final permit V-18-055 R1.	Method 5	6.11 lb/hr 97.3% control efficiency (CE)	0.355 lb/hr; @ 96.9 % CE 0.673 lb/hr @ 98.2 % CE	2.358 tph	CMN2020 0001	1/28/2020 & 1/29/2020
EU 07		SO ₂ EF	401 KAR 52:020, Section 10, and to preclude 401 KAR 59:105, New process gas streams, Section 4		Method 6	< 90 tpy (source-wide)	ESP 2: 0.968 lb/ton	Operating rate 2.65 tph for test at ESP 2	CMN2020 0002	1/12/2021 & 1/13/2021
							ESP 1: 0.857 lb/ton	Operating rate 2.69 tph for test at ESP 1		
EU 07	Two Electrostatic Precipitator, K-90-27A & B	PM control efficiency	401 KAR 52:020, Section 10	Within 180 days of issuance of V-25-003 and Every 5 years thereafter	Method 5	TBD	TBD	TBD	TBD	TBD

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
EU 24	Thermal Oxidizer TO #1	CO	401 KAR 52:020, Section 10, to establish emission factor	Within 180 days start-up	Method 10	NA	0.08 lb/hr	Operating rate 7048 lb/hr	CMN2021 0002	11/9/2021 – 11/10/2021
		SO ₂			Method 6	90 tpy (source-wide)	0.01 lb/hr			
		VOC	401 KAR 52:020, Section 10	Within 180 days start-up, then every 5 years	Method 25A	NA	0.03 lb/hr	Operating Rate 7048 lb/hr; temp. established: 1150 °F		
EU 24	Thermal Oxidizer TO #1	VOC	401 KAR 52:020, Section 10	Every 5 years	Method 25A	TBD	TBD	TBD	TBD	TBD
EU 25	Thermal Oxidizer TO #2	CO	401 KAR 52:020, Section 10, to establish emission factor	Within 180 days start-up	Method 10	NA	0.02 lb/hr	Operating rate 6204 lb/hr	CMN2021 0002	11/9/2021 – 11/10/2021
		SO ₂			Method 6	<90 tpy (source-wide)	:8.92 lb/hr			
		VOC		Within 180 days start-up, then every 5 years	Method 25A	NA	1.68 lb/hr Temp est. 1434.2 °F			
EU 25	Thermal Oxidizer TO #2	VOC	401 KAR 52:020, Section 10	Every 5 years	Method 25A	TBD	TBD	TBD	TBD	TBD

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
EU 26	Thermal Oxidizer TO #3	CO	401 KAR 52:020, Section 10, to establish emission factor	Within 180 days start-up	Method 10	NA	0.07 lb/hr	Operating rate 6671 lb/hr	CMN2021 0002	12/9/2021
		SO ₂			Method 6	<90 tpy (source-wide)	3.69 lb/hr			
		VOC		Within 180 days start-up, then every 5 years	Method 25A	NA	0.04 lb/hr Temp. est. 1295.3 °F			
EU 26	Thermal Oxidizer TO #3	VOC	401 KAR 52:020, Section 10	Every 5 years	Method 25A	TBD	TBD	TBD	TBD	TBD

Footnotes:

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:

Emission and Operating Limit	Regulation	Emission Unit
< 90 tons per year NO _x	Voluntary limit to preclude being a major source of NO _x emissions	Source-wide
< 90 tons per year SO ₂	Pursuant to 401 KAR 52:020, Section 10, and to preclude 401 KAR 59:105, New process gas streams, Section 4, the source has elected to accept a source-wide emission limit for SO ₂	

Table B - Summary of Applicable Regulations:

Applicable Regulations	Emission Unit
401 KAR 50:012, General application (RAP)	EU 04, 24, 25, 26, 26a
401 KAR 59:010, New Process Operations	EU 01, 01-2, 01-3, 02, 04, 05, 05-2, 05-3, 06, 07, 15, 15-2, 16, 17, 24, 25, 26, 26a, IAs
401 KAR 59:015, New indirect heat exchangers	EU 09, 10, 21, 22, 23, 28
401 KAR 59:105, New process gas streams	EU 07, 24, 25, 26, 26a
401 KAR 61:015, Existing indirect heat exchangers	EU 08
401 KAR 63:010, Fugitive Emissions	EU 01-1, 05-1, IAs
401 KAR 63:020, Potentially Hazardous Matter or Toxic Substances	EU 03, 04, 07, 08, 09, 10, 21, 22, 23, 24, 25, 26, 26a, 28
401 KAR 60:005, Section 2.(2)(r), 40 C.F.R. 60.110b through 60.117b, (Subpart Kb) Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984	EU 03 (coal tar pitch only), EU 24
401 KAR 60:005, Section 2.(2)(dddd), 40 C.F.R. 60.4200 through 60.4219, Tables 1 through 8, (Subpart IIII), Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	EU 20, EU 27
401 KAR 60:005, Section 2(2)(eeee) 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	EU 19
401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines	EU 12, 18, 19, 20, 27
401 KAR 63:002, Section 2.(4)(ddddd), 40 C.F.R. 63.11110 through 63.11132, Tables 1 through 3 (Subpart CCCCC), National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities	EU 14
40 CFR Part 64, Compliance Assurance Monitoring	EU 04, 07

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS (CONTINUED)

Table C – Summary of Precluded Regulations:

Precluded Regulations	Emission Unit
401 KAR 59:105, New process gas streams	Source-wide

Table D – Summary of Non Applicable Regulations:

Regulation		Emission Unit
401 KAR 59:105, New process gas streams	Note: the CO standard does not apply pursuant to 401 KAR 59:105, Section 1(c)	EU 07, 25, 26, 26a

Air Toxic Analysis

401 KAR 63:020, Potentially Hazardous Matter or Toxic Substances

The Division for Air Quality (Division) has performed Screen View on January 22, 2025 of potentially hazardous matter or toxic substances (Benzo[A]Anthracene, Benzo[B]Fluoranthene, Benzo[G,H,I]Perylene, Benzo[K]Fluoranthene, Dibenzo (A,H) Anthracene, Indeno (1,2,3-Cd) Pyrene, Benzo[A]Pyrene and Chrysene) that may be emitted by the facility based upon the process rates, material formulations, stack heights and other pertinent information provided by the applicant.

Single Source Determination

N/A

SECTION 5 - PERMITTING HISTORY

Permit	Permit Type	Activity#	Complete Date	Issuance Date	Summary of Action
V-01-023	Initial Title V	Log #53865	6/20/2001	1/30/2003	Permit Renewal/Initial Title V
V-01-023 R1	Minor Revision	APE20050001	5/20/2005	6/6/2005	Increase in throughput of Hargraf Cleaning Machine
V-01-023 R2	Minor Revision	APE20060002	1/31/2007	7/27/2007	Increase in throughput for Ring Bake Furnace, addition of insignificant activity, change to particulate matter emission limit from Hargraf Cleaning Machine, correction of equipment name
V-07-032	Title V Renewal	APE20070001	8/2/2007	4/9/2008	Permit Renewal
V-07-032 R1	Minor Revision	APE20100001	7/28/2010	11/9/2010	Change from thermal oxidizer to Regenerative Catalytic Oxidizer
V-12-050	Title V Renewal	APE20120002	3/19/2013	5/23/2014	Permit Renewal, addition of end milling machine, new CAM requirements, emergency engines moved to Section B of the permit
V-12-050 R1	Admin Amend.	APE20160002	5/26/2016	6/1/2016	Name change from SGL Carbon, LLC to SGL GE Carbon, LLC
V-12-050 R2	Minor Revision	APE20160003	1/12/2017	4/12/2017	Change from regenerative catalytic oxidizer to Regenerative Thermal Oxidizer
V-12-050 R3	Admin Amend	APE20170003	12/5/2017	12/9/2017	Name change from SGL GE Carbon LLC to Tokai Carbon GE LLC
V-18-055	Title V Renewal	APE20180002	1/2/2019	9/12/2019	Permit Renewal
V-18-055 R1	Significant Revision	APE20190001	10/3/2019	7/20/2020	Addition of Pitch Impregnation Process and two Carbottom Furnaces
V-18-055 R2	Minor Revision	APE20200001	6/22/2020	1/24/2021	Addition of Met Coke Screening for Baking Conveyor System
V-18-055 R2	Minor Revision	APE20210001	12/2/2021	2/20/2022	Removal of EU 13 and Addition of EU 27 Fire Pump Engine

SECTION 6 – PERMIT APPLICATION HISTORY:

N/A

APPENDIX A – ABBREVIATIONS AND ACRONYMS

AAQS	– Ambient Air Quality Standards
BACT	– Best Available Control Technology
Btu	– British thermal unit
CAM	– Compliance Assurance Monitoring
CO	– Carbon Monoxide
Division	– Kentucky Division for Air Quality
ESP	– Electrostatic Precipitator
GHG	– Greenhouse Gas
HAP	– Hazardous Air Pollutant
HF	– Hydrogen Fluoride (Gaseous)
MSDS	– Material Safety Data Sheets
mmHg	– Millimeter of mercury column height
NAAQS	– National Ambient Air Quality Standards
NESHAP	– National Emissions Standards for Hazardous Air Pollutants
NO _x	– Nitrogen Oxides
NSR	– New Source Review
PM	– Particulate Matter
PM ₁₀	– Particulate Matter equal to or smaller than 10 micrometers
PM _{2.5}	– Particulate Matter equal to or smaller than 2.5 micrometers
PSD	– Prevention of Significant Deterioration
PTE	– Potential to Emit
SO ₂	– Sulfur Dioxide
TF	– Total Fluoride (Particulate & Gaseous)
VOC	– Volatile Organic Compounds
CAM	– Compliance Assurance Monitoring
RAP	– Reasonable Available and Practical
PI	- Pitch Impregnation
CB	- Carbottom

APPENDIX B – INDIRECT HEAT EXCHANGER EMISSIONS LIMITATIONS

Summary of All Affected Facilities Used to Determine 401 KAR 59:015 Emission Limits								
EU	Fuel	Capacity: MMBtu/hr	Constructed	Basis for PM Limit	Total Heat Input Capacity for PM Limit (MMBtu/hr)	Basis for SO ₂ Limit	Total Heat Input Capacity for SO ₂ Limit (MMBtu/hr)	Notes
08	Natural Gas	6.1	7/1/1966	401 KAR 61:015, Section 4(1)(a)	6.1	401 KAR 61:015, Section 5(1)(a)	6.1	Priority I for PM Priority V for SO ₂
09	Natural Gas	2.51	8/13/1974	401 KAR 59:015, Section 4(1)(a)	8.61	401 KAR 59:015 Section 5(1)(a)	8.61	
10	Natural Gas	6.3	1/1/1982	401 KAR 59:015, Section 4(1)(c)	14.91	401 KAR 59:015 Section 5(1)(c)	14.91	
11	Natural Gas	2.4	1/1/1997	Unit was subject to 401 KAR 59:015				Removed from facility
21	Natural Gas	8.0	2/15/2020	401 KAR 59:015, Section 4(1)(c)	33.31	401 KAR 59:015 Section 5(1)(c)	33.31	
22	Natural Gas	2.4	2/15/2020	401 KAR 59:015, Section 4(1)(c)	33.31	401 KAR 59:015 Section 5(1)(c)	33.31	
23	Natural Gas	8.0	2/15/2020	401 KAR 59:015, Section 4(1)(c)	33.31	401 KAR 59:015 Section 5(1)(c)	33.31	
28	Natural Gas	5	12/1/2023	401 KAR 59:015, Section 4(1)(c)	38.31	401 KAR 59:015 Section 5(1)(c)	38.31	