

Fact Sheet



***For Final Renewal Permitting Action Under 45CSR30 and
Title V of the Clean Air Act***

Permit Number: **R30-00300012-2024**
Application Received: **September 12, 2023**
Plant Identification Number: **03-054-00300012**
Permittee: **Knauf Insulation, Inc.**
Facility Name: **Inwood Plant**
Mailing Address: **4812 Tabler Station Road, Inwood, WV 25428**

Physical Location: Inwood, Berkeley County, West Virginia
UTM Coordinates: 756.55 km Easting • 4,365.50 km Northing • Zone 17
Directions: From Martinsburg, take I-81 southwest to Tabler Station Road, Exit 8 (County Route 32). Site is located on the southeast corner of the I-81 and County Route 32 intersection.

Facility Description

Raw Materials are mixed into a batch and the batch is then melted to form glass. The molten glass is separated into streams by use of a forehearth and fiber is spun into strands by the means of fiberizers. The fibers are collected to form a blanket then cured in a three-zone oven. Upon exiting the curing oven the blanket is cooled using a "cooling table". The cooled blanket is then cut to size in rolls and batts of insulation per customer requirements. The facility is characterized by SIC code 3296 (wool fiberglass manufacturing).

Emissions Summary

Plantwide Emissions Summary [Tons per Year]		
Regulated Pollutants	Potential Emissions	2023 Actual Emissions
Carbon Monoxide (CO)	172.4	30.31
Nitrogen Oxides (NO _x)	200.1	151.26
Particulate Matter (PM _{2.5})	207.6	92.59
Particulate Matter (PM ₁₀)	209.2	92.59
Total Particulate Matter (TSP)	210.8	92.59
Sulfur Dioxide (SO ₂)	35.8	12.03
Volatile Organic Compounds (VOC)	112.2	37.96
<i>PM₁₀ is a component of TSP.</i>		
Hazardous Air Pollutants	Potential Emissions	2023 Actual Emissions
n-Hexane	2.27	Not reported
Total HAP	2.77	Not reported

Some of the above HAPs may be counted as PM or VOCs.

Title V Program Applicability Basis

This facility has the potential to emit 172.4 tpy of CO; 200.1 tpy of NO_x; 209.2 tpy of PM₁₀; and 112.2 tpy of VOC. Due to this facility's potential to emit over 100 tons per year of criteria pollutant, Knauf Insulation, Inc. is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

Legal and Factual Basis for Permit Conditions

The State and Federally-enforceable conditions of the Title V Operating Permits are based upon the requirements of the State of West Virginia Operating Permit Rule 45CSR30 for the purposes of Title V of the Federal Clean Air Act and the underlying applicable requirements in other state and federal rules.

This facility has been found to be subject to the following applicable rules:

Federal and State:	45CSR6	Open burning prohibited.
	45CSR7	PM from manufacturing processes
	45CSR10	Control of Air Pollution from Sulfur Oxides
	45CSR11	Standby plans for emergency episodes.
	45CSR13	Construction/Modification permitting
	45CSR14	Prevention of Significant Deterioration
	45CSR16	Standards of Performance for New Stationary Sources pursuant to 40 C.F.R. Part 60
	WV Code § 22-5-4 (a) (14)	The Secretary can request any pertinent information such as annual emission inventory reporting.
	45CSR30	Operating permit requirement.
	45CSR34	Emission Standards for HAPs pursuant to 40 C.F.R. Part 63
	40 C.F.R. Part 60 Subpart PPP	NSPS: Wool Fiberglass Insulation Mfg. Plants.

40 C.F.R. 60 Subpart IIII	NSPS for CI Stationary Engines
40 C.F.R. Part 61	Asbestos inspection and removal
40 C.F.R. Part 63, Subpart ZZZZ	NESHAPs MACT: Stationary RICE
40 C.F.R. Part 82, Subpart F	Ozone depleting substances

State Only: 45CSR4 No objectionable odors.

Each State and Federally-enforceable condition of the Title V Operating Permit references the specific relevant requirements of 45CSR30 or the applicable requirement upon which it is based. Any condition of the Title V permit that is enforceable by the State but is not Federally-enforceable is identified in the Title V permit as such.

The Secretary's authority to require standards under 40 C.F.R. Part 60 (NSPS), 40 C.F.R. Part 61 (NESHAPs), and 40 C.F.R. Part 63 (NESHAPs MACT) is provided in West Virginia Code §§ 22-5-1 *et seq.*, 45CSR16, 45CSR34 and 45CSR30.

Active Permits/Consent Orders

Permit or Consent Order Number	Date of Issuance	Permit Determinations or Amendments That Affect the Permit (<i>if any</i>)
R14-0015O	July 11, 2022	

Conditions from this facility's Rule 13 permit(s) governing construction-related specifications and timing requirements will not be included in the Title V Operating Permit but will remain independently enforceable under the applicable Rule 13 permit(s). All other conditions from this facility's Rule 13 permit(s) governing the source's operation and compliance have been incorporated into this Title V permit in accordance with the "General Requirement Comparison Table," which may be downloaded from DAQ's website.

Determinations and Justifications

There were no changes to the facility since the minor modifications of the permit (MM01 and MM02) were issued on June 18, 2019 and October 3, 2022 (respectively) to reflect underlying permit modifications R14-0015N and R14-0015O (respectively). The only minor change to the permit is described in item 1 below:

1. Emission Units Table 1.1 – in Control Devices section of the table an Emission Point ID “FP11” was replaced with “EP23” for Control Devices IDs CD1A, CD1B, CD1D, CD1F, CD1G, CD1I, CD1K, CD1L, CD1M, and CD1N to match the RAW MATERIAL HANDLING OPERATIONS (Group 001) section and actual configuration of the vents at the facility.
2. Consent Order CO-R30-E-2024-02 - was issued to the Company on January 30, 2024 for failing NOx and PM emission tests conducted on April 18, 2023. The Company was issued a NOV, and re-tested for NOx and PM emissions on July 6, 2023 and October 10, 2023 (both tests results were compliant). Also, per the Consent Order, Order of Compliance (item 1) the Company was required to pay a civil administrative penalty of \$14,600 to resolve these violations. The payment was received in a timely manner (on 02/29/2024), and the Consent Order CO-R30-E-2024-02 was terminated (according to Other Provisions, item 8).

Non-Applicability Determinations

The following requirements have been determined not to be applicable to the subject facility due to the following:

1. **40 C.F.R. Part 64 – Compliance Assurance Monitoring.** One or more of the following characteristics of the permittee’s emission units make the emission units, on a pollutant-specific basis, not subject to CAM.

- a. The emission unit emits particulate matter and such emissions are subject to 40 C.F.R. 60 Subpart PPP.
- b. The emission unit emits other criteria pollutant(s) or HAPs in pre-control amounts less than the respective major source threshold.
- c. The emission unit has no associated control device for the specific pollutant emitted.

2. **45CSR10 to certain sources.** The emission units in the following table are not subject to 45CSR10:

Emission Unit ID	Description of Emission Unit	Rationale for Non-applicability of 45CSR10
ESDG12	Emergency backup generator, diesel IC engine	Internal combustion engines, including gas turbines and emergency generators, are not subject to 45CSR10 as per Director’s verbal guidance.
ESDG13	Emergency backup generator, diesel IC engine	Internal combustion engines, including gas turbines and emergency generators, are not subject to 45CSR10 as per Director’s verbal guidance.
ESDG14	Emergency backup generator, diesel IC engine	Internal combustion engines, including gas turbines and emergency generators, are not subject to 45CSR10 as per Director’s verbal guidance.
ESFW11	Fire suppression water, diesel IC engine	Internal combustion engines, including gas turbines and emergency generators, are not subject to 45CSR10 as per Director’s verbal guidance.
ESSH15	Space heating natural gas-fired make-up air heat exchanger, 8.525 MMBtu/hr	Not a “source operation” defined in 45CSR§10-2.19., therefore 4.1. does not apply. Not a “fuel burning unit” as defined in 45CSR§10-2.8.; therefore, 3.3. does not apply.
ESSH16	Space heating natural gas-fired make-up air heat exchanger, 7.875 MMBtu/hr	Not a “source operation” defined in 45CSR§10-2.19., therefore 4.1. does not apply. Not a “fuel burning unit” as defined in 45CSR§10-2.8.; therefore, 3.3. does not apply.

3. **40 C.F.R. 60 Subparts K, Ka, and Kb.** These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to petroleum liquids storage tanks constructed, reconstructed, or modified after June 11, 1973, and prior to May 19, 1978, and Subpart Ka applies to those constructed, reconstructed, or modified after May 18, 1978, and prior to July 23, 1984. Both Subparts K and Ka apply to storage tanks with a capacity greater than 40,000 gallons. Subpart Kb applies to volatile organic liquid (VOL) storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 m³ (~19,813 gallons). All storage tanks at the Inwood facility have a capacity less than 75 m³. Therefore, Subparts K, Ka, and Kb do not apply to the storage tanks at the Inwood facility.

4. **40 C.F.R. 60 Subpart CC – Glass Manufacturing Plants.** This subpart applies to glass melting furnaces constructed after June 15, 1979. This subpart does not apply to furnaces that produce less than 4.55 Mg (5 tons) of glass per day and all-electric melters. An all-electric melter is a melting furnace in which all of the heat is provided by electric current, although some fossil fuel may be charged to the furnace as raw material only. The furnace for Line 1 at the Inwood facility qualifies as an all-electric melters and therefore Subpart CC does not apply.

Knauf is permitted under R14-0015M to install a new gas oxygen-fueled (gas-oxy) glass melting furnace on Line 2 at the Inwood facility that does not have a refractory brick lining. In 40 C.F.R. §60.291, the regulation defines a *Glass melting furnace* as a unit comprising a refractory vessel in which raw materials are charged, melted at high temperature, refined, and conditioned to produce molten glass. The unit includes foundations, superstructure and retaining walls, raw material charger systems, heat exchangers, melter cooling system,

- exhaust system, refractory brick work, fuel supply and electrical boosting equipment, integral control systems and instrumentation, and appendages for conditioning and distributing molten glass to forming apparatuses. The permitted design that Knauf has selected for Line 2 is a stainless-steel vessel with a water-cooled jacket and no refractory is utilized in the vessel to contain the melting process. Thus, the proposed melter is not a refractory vessel, and does not meet the definition of *Glass melting furnace* in §60.291. Consequently, the Line 2 furnace is not subject to the emission standard of Subpart CC.
5. **40 C.F.R. 60 Subpart JJJJ – Stationary Spark Ignition Internal Combustion Engines.** This subpart applies to manufacturers, owners, and operators of stationary spark ignition internal combustion engines (ICE) that have been constructed, reconstructed, or modified after various dates, the earliest of which is June 12, 2006. All of the engines at the Inwood facility, including emergency generators, are compression ignition IC engines, and therefore the requirements of this subpart do not apply.
 6. **40 C.F.R. 61 Subpart N – Inorganic Arsenic Emissions from Glass Manufacturing Plants.** This NESHAP applies to glass melting furnaces that use commercial arsenic as a raw material. Since the Inwood facility does not use any arsenic as a raw material this subpart does not apply.
 7. **40 C.F.R. 63 Subpart Q – Industrial Process Cooling Towers.** This NESHAP-MACT applies to all new and existing industrial process cooling towers that are operated with chromium-based water treatment chemicals and are either major sources or are integral parts of facilities that are major sources as defined in §63.401. Since the Inwood facility is an area (minor) source of HAP, it does not meet the applicability criteria in §63.400, and the three (3) cooling towers (CT3, CT4, and CT5) are not subject to this subpart.
 8. **40 C.F.R. 63 Subpart HHHH – Glass Manufacturing Area Sources: National Emission Standards for Hazardous Air Pollutants for Wet-Formed Fiberglass Mat Production.** This regulation applies to facilities that produce wet-formed fiberglass mat. Such facilities must own or operate a drying and curing oven at a wet-formed fiberglass mat production facility and must be located at a major source of hazardous air pollutants (HAP). The Inwood facility is a wool-fiberglass production facility that produces insulation whereas the wet-formed fiberglass is a material used in the manufacture of asphalt roofing products (shingles and rolls). Further, the Inwood facility is not a major source of HAP. Therefore, Subpart HHHH does not apply to the Inwood facility.
 9. **40 C.F.R. 63 Subpart DDDDD – Industrial, Commercial, and Institutional Boilers and Process Heaters.** This NESHAP-MACT standard applies to industrial, commercial, and institutional boilers and process heaters of various sizes and fuel types at major sources of HAP emissions. Knauf’s Inwood facility is considered an area source for HAP. Therefore, there are no units at the Inwood facility subject to Subpart DDDDD.
 10. **40 C.F.R. 63 Subpart JJJJJJ - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources.** With the changes approved in R14-0015L the facility is an area source of HAP. Further, the Air Handling Units ESSH15 and ESSH16 are not boilers as defined in §63.11237. That is, the units do not heat water to recover thermal energy in the form of steam and/or hot water. For these reasons the Air Handling Units ESSH15 and ESSH16 are not subject to Subpart JJJJJJ.
 11. **45CSR2 – To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers.** This rule establishes emission limitations for smoke and particulate matter which are discharged from fuel burning units (45CSR§2-1.1). A “fuel burning unit” means and includes any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer (45CSR§2-2.10.). The Air Handling Units ESSH15 and ESSH16 are not indirect heat exchangers, which was confirmed by review of the 2013 renewal application. This rule also does not apply to the Line 2 melter permitted in R14-0015M since the unit is direct-fired.

12. **40 C.F.R. 63 Subpart NN – National Emission Standards for Hazardous Air Pollutants for Wool Fiberglass Manufacturing at Area Sources.** This NESHAP-MACT applies to the owner or operator of each wool fiberglass manufacturing facility that is an area source or is located at a facility that is an area source of HAP (cf. §63.880(a)). In particular, this subpart applies to emissions of chromium compounds emitted from new and existing *gas-fired glass-melting furnaces* located at a wool fiberglass manufacturing facility that is an area source (cf. §63.880(b)). The permittee owns and operates a wool fiberglass manufacturing facility that is an area source of HAP; however, Line 1 does not utilize a *gas-fired glass-melting furnace*. Instead, Line 1 utilizes a *cold top electric glass-melting furnaces* as defined in 40 C.F.R. 63 Subpart NNN (cf. §63.1381). The furnace type was confirmed by the permittee as part of the technical review for the 2008 Title V permit renewal and was documented in its Fact Sheet. The permittee confirmed in 12/16/2015 technical correspondence that the furnace for Line 1 is a *cold top electric glass-melting furnaces*. The definition of *gas-fired glass-melting furnace* in §63.881 specifically states that cold-top electric glass-melting furnaces as defined in Subpart NNN of this part are not gas-fired glass-melting furnaces. Since the permittee's furnace for Line 1 does not meet the definition of *gas-fired glass-melting furnace* in §63.881 the Line 1 furnace is not subject to the limitations and standards in 40 C.F.R. 63 Subpart NN.

Line 2 Modification Permitted in R14-0015M

Subpart NN applies to each wool fiberglass manufacturing facility that is an area source. The requirements apply to each new and existing gas-fired melting furnace, where a gas-fired glass melting furnace is defined as:

A unit comprising a refractory vessel in which raw materials are charged, melted at high temperature using natural gas and other fuels, refined, and conditioned to produce molten glass. The unit includes foundations, superstructure and retaining walls, raw material charger systems, heat exchangers, exhaust system, refractory brick work, fuel supply and electrical boosting equipment, integral control systems and instrumentation, and appendages for conditioning and distributing molten glass to forming processes. The forming apparatus, including flow channels, is not considered part of the gas-fired glass-melting furnace. Cold-top electric furnaces as defined in Subpart NNN are not gas-fired glass-melting furnaces.

The permitted design that Knauf has selected for Line 2 is a stainless-steel vessel with a water-cooled jacket and no refractory is utilized in the vessel to contain the melting process. Thus, the melter is not a refractory vessel, and does not meet the definition of *Gas-fired glass-melting furnace* in §63.881. Consequently, the Line 2 furnace is not subject to the emission standard of Subpart NN.

13. **40 C.F.R. 63 Subpart NNN – National Emission Standards for Hazardous Air Pollutants for Wool Fiberglass Manufacturing.** This NESHAP-MACT applies to the owner or operator of each wool fiberglass manufacturing facility that is a major source or is located at a major source of HAP (cf. §63.1380(a)). Further, this subpart does not apply to a wool fiberglass manufacturing facility that is not a major source of HAP emissions (cf. §63.1380(c)). Pursuant to 40 C.F.R. §63.1381, Subpart NNN regulates HAP emissions from various emission units at new and existing major source wool fiberglass manufacturing facilities, including: glass melting furnaces, rotary spin wool fiberglass manufacturing lines producing a bonded wool fiberglass insulation product using a phenol/formaldehyde binder. Knauf made a process change in 2016 to eliminate the use of phenol/formaldehyde resins in their binder formula as part of their ECOS system. Also, the facility is an area (non-major) source of HAP emissions. For these reasons, the requirements of 40 CFR 63 Subpart NNN do not apply to the facility.
14. **40 C.F.R. 63 Subpart SSSSSS – Glass Manufacturing Area Sources: National Emission Standards for Hazardous Air Pollutants (NESHAP).** This regulation applies to a glass manufacturing facility that is an area source of hazardous air pollutant (HAP) emissions and meets all of the criteria specified in paragraphs (a) through (c) of §63.11448. In accordance with technical correspondence received from the permittee on February 22, 2019, the permittee's facility does not meet the criterion in 40 C.F.R. §63.11448(a) since it does not manufacture flat glass, glass containers, or pressed and blown glass. For this reason, Subpart SSSSSS is not applicable to the facility.

Request for Variances or Alternatives

None.

Insignificant Activities

Insignificant emission unit(s) and activities are identified in the Title V application.

Comment Period

Beginning Date: July 23, 2024

Ending Date: August 22, 2024

Point of Contact

All written comments should be addressed to the following individual and office:

Natalya V. Chertkovsky-Veselova
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Division of Air Quality
601 57th Street SE
Charleston, WV 25304
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Procedure for Requesting Public Hearing

During the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing, if no public hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. The Secretary shall grant such a request for a hearing if he/she concludes that a public hearing is appropriate. Any public hearing shall be held in the general area in which the facility is located.

Response to Comments (Statement of Basis)

On August 30, 2024 WV DAQ received by email the following comments from Mr. J. Adam Whapham, Region 3, Air Permits Branch, US EPA Mid-Atlantic Region:

“We have reviewed the Draft/Proposed Title V Permit Renewal for Knauf Insulation. Upon review, we have a few comments we would like to see addressed in the final permit. If possible, we would like to see the boilerplate language updated in Condition 3.3.1.(b). Next, Condition 6.2.7. references a “Reserved” Condition (Condition 3.3.4). We believe both these changes to be administrative in nature and can be addressed in the final permit. We do not need a second review of the permit.”

WV DAQ response to the comments:

- 1) Per further discussion with US EPA, we reached a mutual agreement that the boilerplate language in Condition 3.3.1.(b) will not be changed at this time.
- 2) There is an error in condition 6.2.7 (underlying R14-00150 permit condition 4.2.6): in the first part it refers to a “Reserved” (non-existing) condition 3.3.4. The condition 3.3.4 was removed from the permit during previous permit modification MM02 (based on R14-00150). Condition 3.3.4 contained an initial testing requirement, and since the test was performed, the requirement became obsolete and was removed from both the underlying permit R14-00150 and the Title V permit. At the time it was overlooked that the condition 3.3.4 was still mentioned in the requirement 6.2.7 (R14-00150 permit condition 4.2.6). Since the test results for SO₂ emission rate was measured above 50% of the limit in requirement 5.1.1, the second part of the condition 6.2.7 still applies: “the permittee shall monitor and record the amount of raw materials or feedstock

that contains sulfur compounds consumed each month”. The company keeps electronic records of all sulfur containing batch materials consumed monthly.

As the result of the comment, the condition 6.2.7 was revised by removing the first part (obsolete condition referring to “Reserved” condition 3.3.4) and keeping the second part (still applicable) as follows:

~~“6.2.7. Should the measured sulfur dioxide emission rate as required in Condition 3.3.4. be greater than 50 percent of the permitted SO₂ limit in condition 5.1.1., then~~ The permittee shall monitor and record the amount of raw materials or feedstock that contains sulfur compounds consumed each month. Such records shall be maintained in accordance with Condition 3.4.2.

[45CSR14, R14-0015, 4.2.6.]”