West Virginia Department of Environmental Protection
Division of Air Quality

Fact Sheet

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

Permit Number: **R30-00300012-2019**
Application Received: **March 19, 2018**
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**	**2017 Actual Emissions[1]**
Carbon Monoxide (CO)	172.4	22.94
Nitrogen Oxides (NO_X)	200.1	31.77
Particulate Matter ($PM_{2.5}$)	207.6	58.14
Particulate Matter (PM_{10})	209.2	58.45
Total Particulate Matter (TSP)	214.9	70.10
Sulfur Dioxide (SO_2)	25.8	2.98
Volatile Organic Compounds (VOC)	112.2	43.51
Hazardous Air Pollutants	**Potential Emissions**	**2017 Actual Emissions[1]**
n-Hexane	1.0	Not reported
Total HAP	1.0	2.6×10^{-3}
Regulated Pollutants other than Criteria and HAP	**Potential Emissions**	**2017 Actual Emissions[1]**
Ammonia	229.57	78.47

[1] Actual emissions are from the State and Local Emissions Inventory System (SLEIS) Total Emissions by Source Summary Report.

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 PM_{10}; 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 *(if any)*
R14-0015M	September 20, 2017	

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

For this renewal no new regulations, rules, or other requirements have become applicable to the facility and its emission units. The following changes have been made to the current Title V permit R30-00300012-2013 (SM01) to produce the renewal permit:

I. **Tank Revisions.** Various changes associated with the tanks were suggested by the permittee in the renewal application and have been addressed below.

a. Tank M7, a filtered water hold tank, that was added as part of the Line 2 project (Permit R14-0015M; R30-00300012-2013 (SM01)) has been added to the emission units table in permit section 1.1 under TANKS (Group 001) and to the heading of permit section 4.0.

b. The capacity has been corrected for various tanks under the Group 001 portion of the Emission Units table in section 1.1. as well as the names of certain tanks as detailed below.

i. The capacity of each of the tanks T3, T4, T5, and T6 has been changed from 4,500 gallons to 5,131 gallons.

ii. The name of tank M1 has been changed from "Ammonia Sulfate Mix Tank" to "Catalyst Mix Tank".

iii. The name of tank M2 has been changed from "Ammonia Sulfate Holding Tank" to "Catalyst Hold Tank". The capacity of tank M2 has been changed from 1,700 gallons to 1,500 gallons.

iv. The name of Tank M4 has been changed from "Filtered Water Hold Tank" to "Binder Holding Tank". The capacity of M4 has been changed from 3,200 gallons to 1,750 gallons.

v. The name of Tank M6 has been changed from "Binder Hold Tank" to "Binder Holding Tanks". The capacity of M6 has been changed from 1,700 gallons to 1,600 gallons.

II. **Revisions and Corrections to Control Device and Emission Point IDs**

a. The thermal oxidizer identified as CD14A has been reinstated in the section 1.1. Emission Units table under Curing & Cooling Line 1 (Group 006) in accordance with the permittee's request. The permit writer for the last permit modification relocated the control devices from the emission units table to a separate control device table in section 1.1. to reflect the underlying permit.

b. For emission unit ES15C (Edge Trimmers and Dicers (or Cubes)), the application indicates a change in control devices from "CD15C and CD15D" to "CD13A, CD13B, CD13C". CD15D has been removed from service per 10/29/2018 technical correspondence; therefore, it would be removed from this row. The remaining control device CD15C has been changed to "CD13A, CD13B, CD13C" and the emission point ID has been changed from FP15 to EP13. The emission point EP13 has been added to the heading in Section 8.0.

c. For emission unit ES25C (Edge Trimmers and Dicers (or Cubes)), the application indicates a change in control devices from "CD25A" to "CD23A, CD23B, CD23C, CD23D" and change the emission point ID from FP23 to FP15. However, the permittee stated in technical review that the emission point ID should be changed to EP23. The control devices and emission point IDs have been changed accordingly. The emission point EP23 has been added to the heading in Section 8.0.

d. For emission unit ES25I the emission point ID has been changed from FP23 to FP15. The control devices have been changed from CD25C and CD25D to CD15A. Permit section heading 8.0 has been revised to associate ES25I with emission point ID FP15.

e. For emission unit ES25L the emission point ID has been changed from FP23 to FP15. The control devices have been changed from CD25C and CD25D to CD15A. Permit section heading 8.0 has been revised to associate ES25L with emission point ID FP15.

f. According to 10/29/2018 technical correspondence, the two Screen Rooms, together identified as CD15D, were taken out of service during the Melting Line No. 1 modifications that occurred in 2016. Therefore, the following changes have been made in the renewal permit:

i. In the emission units table:

1. CD15D has been deleted from the control device column in the rows for emission units ES15C, ES15H, and ES15I, under Facing Sizing & Packaging for Line 1 (Group 008).

2. The row identifying emission unit CD15D has been deleted under Facing Sizing & Packaging for Line 1 (Group 008).

3. In the control device table, CD15D has been deleted from the control device column for the row containing the Dual Cyclone and Condenser identified as CD15C.

ii. CD15D has been deleted from the heading of Section 8.0 of the renewal permit.

g. The installation dates for ES25B, ES25D, ES25F, and ES25G have been changed from 2004 to 2017 due to old equipment being replaced and overhauled per 10/29/2018 technical correspondence.

h. In the control device table in section 1.1., the description of CD11a and CD11b has been changed from "TBD" to "Donaldson Dust Collector". These changes also have been made in permit condition 4.1.1. for emission units ES11a and ES11b. Additionally, application Attachment G for CD11a and CD11b states a capacity of 1,000 acfm, which has been added to the control device table.

i. In the control device table in section 1.1., the descriptions of CD1L, CD1M, and CD1N have been changed from "Bin Vent" to "Donaldson Dust Collector" to reflect the as-built design. These changes also have been made in permit condition 4.1.1. for emission units ES1L, ES1M, and ES1N.

j. In the control device table in section 1.1., a typographical error has been corrected by changing CB13C to CD13C.

III. **Miscellaneous Revisions.**

a. The permittee suggested to eliminate emission unit ES25K. This emission unit has been deleted from Group 008 in the Emission Units table in permit section 1.1. and the heading of permit section 8.0.

b. In the emission units table under raw material handling operations, the description of ES12Db has been changed from "Silo" to "Day Bin" since this more accurately aligns with Knauf terminology (cf. permittee's 10/29/2018 technical correspondence).

c. A non-applicability determination regarding 40 C.F.R. 63 Subpart NNN has been added in section 3.7.2.13. This was in the Fact Sheet for R30-00300012-2013 (SM01) but was not included in the revised permit.

d. Reserved permit conditions have been deleted and subsequent conditions renumbered where applicable.

Non-Applicability Determinations

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

a. **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.

i. The emission unit emits particulate matter and such emissions are subject to 40 C.F.R. 60 Subpart PPP.

ii. The emission unit emits other criteria pollutant(s) or HAPs in pre-control amounts less than the respective major source threshold.

iii. The emission unit has no associated control device for the specific pollutant emitted.

b. **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.

c. **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 m^3 (~19,813 gallons). All storage tanks at the Inwood facility have a capacity less than 75 m^3. Therefore, Subparts K, Ka, and Kb do not apply to the storage tanks at the Inwood facility.

d. **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 furnaces 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.

e. **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.

f. **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.

g. **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) permitted in R14-0015M are not subject to this subpart.

h. **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.

i. **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.

j. **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.

k. **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.

l. **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.

m. **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. The changes permitted in R14-0015M for Line 2 do not include switching the binder formula back to a phenol/formaldehyde formulation. In addition, based upon permitted emissions in R14-0015M, 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.

n. **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 the criteria specified in paragraphs (a) through (c) of §63.11448. In accordance with technical correspondence received from the permittee on February 22, 2018, 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:	January 30, 2019
Ending Date:	March 1, 2019

Point of Contact

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

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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)

The U.S. EPA address has been revised in condition 3.5.3.