NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date: TBD

Region: Fayetteville Regional Office
County: Cumberland
NC Facility ID: 2600058
Inspector's Name: Evangelyn Lowery-Jacobs
Date of Last Inspection: 12/08/2020
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): MANN+HUMMEL Purolator Filters LLC

Facility Address:
MANN+HUMMEL Purolator Filters LLC
3200 Natal Street
Fayetteville, NC 28306

SIC: 3714 / Motor Vehicle Parts & Accessories
NAICS: 336399 / All Other Motor Vehicle Parts Manufacturing

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 02Q .0504
NSPS: n/a
NESHAP: n/a
PSD: n/a
PSD Avoidance: n/a
NC Toxics: n/a
112(r): n/a
Other: n/a

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Eugene Williams HSE Manager (910) 627-6855 3200 Natal Street Fayetteville, NC 28306	Ian Bonell VP of Operations (704) 642-9354 3200 Natal Street Fayetteville, NC 28306	Aimee Nystrom Environmental Engineer (919) 396-2713 3200 Natal Street Fayetteville, NC 28306

Application Data

Application Number: 2600058.20E & .21A
Date Received: 12/08/20 (.20E) 08/24/21 (.21A)
Application Type: Modification
Application Schedule: TV-Sign-501(b)(2) Part II

Existing Permit Data
Existing Permit Number: 01757/T29
Existing Permit Issue Date: 09/09/2020
Existing Permit Expiration Date: 10/31/2023

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2020	0.0500	8.93	185.18	7.41	12.30	4.44	1.51 [Phenol]
2019	0.0400	8.12	180.03	6.73	13.38	6.07	1.67 [Phenol]
2018	0.0400	8.88	188.22	7.41	15.49	7.04	2.56 [Phenol]
2017	0.0100	4.04	172.23	3.33	23.94	8.85	3.61 [Phenol]
2016	0.0100	3.71	118.20	3.03	20.49	10.94	3.82 [Phenol]

Review Engineer: Russell Braswell

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue 01757/T30
Permit Issue Date: TBD
Permit Expiration Date: October 31, 2023

1. Purpose of Applications:

a. 2600058.21A (received August 24, 2021)

MANN+HUMMEL Purolator Filters LLC (M+H; the facility) currently operates a factory in Cumberland County under Title V permit 01757T29 (the existing permit). The existing permit was issued in response to applications .20C and .20D, which were first steps of a two-step significant modification allowed by 15A NCAC 02Q .0501(b)(2). As a result of those applications, the existing permit includes Specific Condition 2.1 A.5 under 15A 02Q .0502(b)(2), which requires M+H to submit an application for significant modification within 12 months of commencing operation of the sources modified with the .20C and .20D applications. M+H submitted this application in order to comply with this requirement.

b. 2600058.20E (received December 8, 2020)

M+H submitted an application to make an off-permit change as allowed by 15A NCAC 02Q .0523. The application proposed converting a plastisol-based coating process to a polyurethane-based coating process.

2. Facility Description:

M+H manufactures automotive oil filters, air filters, and fuel filters. The oil filter manufacturing process is a continuous process that begins with a bulk supply of filter paper on large rolls. The paper is cut to length, pleated and formed into shape. Filters are then baked or "heat set" in a continuous oven to cure the paper. Filters are then placed in metal cans and plastisol or polyurethane is used as an adhesive to hold the filter to the end caps. The adhesive materials then may be sealed or cured in a final cure oven. In addition to processing the filter paper, M+H creates the steel cans and end caps for its oil filters, which are processed by a series of hydraulic presses.

Once the filters are cured, they go through automated dry powder spray booths for final finish. Fuel filters and air filters are produced in a similar method as the oil filters, including heat set and final cure steps, but using a different paper material. Air filters are formed into cylindrical shapes or rectangular shapes and are set into frames constructed of polyurethane or plastisol.

Fugitive VOC emissions occur from the inks used to label the filters, paint used for touch-up applications and from the miscellaneous use of adhesives and clean-up solvents.

3. Application Chronology:

- December 8, 2020 Application .20E received (502(b)(10) modification).
- December 9, 2020 DAQ responded to the .20E application allowing M+H to implement the changes proposed in the .20E application.
- August 24, 2021 Application .21A received (TV-significant modification, second step of a two-step significant modification).
- September 22, 2021 Initial draft permit and application review sent to RCO Title V supervisor (Heather Sands).
- September 23, 2021 FRO submitted a P&O review of application .21A. The only specific recommendation was to remove the reference to a heat set oven from the

description of ESCART1. Note that this change should have been incorporated into the T29 permit, but was overlooked at that time.

- November 29, 2021 Response received to initial draft. For a summary of comments received, see Section 7.

- December 2, 2021 Draft permit and application review sent to RCO SSCB (Samir Parekh), FRO (Evangelyn Lowery-Jacobs, Jeffery Cole), and M+H staff (Christy Richardson, Aimee Nystrom, Eugene Williams, Phillip Schuster).

- XXXX The Public Notice and EPA review periods began.

- XXXX The Public Notice period ended.

- XXXX The EPA Review period ended.

- XXXX Permit issued.

4. Discussion:

a. Two-Step Significant Modification under 15A NCAC 02Q .0501(b)(2)

Per 15A NCAC 02Q .0501(b)(2), DAQ allows in some circumstances applicants to apply for a significant modification to a Title V permit using a two-step process. The second step of this process requires the applicant to submit a new application for permit modification within 12 months of commencing operation of the modified facility.

M+H used this two-step process to add Air Filter Line 7 (with the .20C application) and the polyurethane dispensing operation and Air Filter Lines 8 and 9 (with the .20D application). DAQ consolidated and reviewed those two applications into one permitting action and issued Permit No. T29 on September 9, 2020. The sources modified by the .20C and .20D applications are listed in the table below.

In application 2600058.21A, M+H stated the above projects were installed as proposed in the Step 1 applications, and that no changes are required to the existing permit regarding these sources. Therefore, DAQ's review of those two applications need not be reevaluated. See Attachment 1 for DAQ's review of those two applications.

In order to demonstrate compliance with the 12-month requirement, M+H included the following information in the current application:

Emission Source ID	Description	Start Date
ESGL1-aR	electric heat set oven	TBD
ESAL7, ESAL7-a, ESAL7-b, and CDAL7	polyurethane air filter line	October 8, 2020
ESAL8, ESAL8-a, ESAL8-b, and CDAL8	polyurethane air filter line	October 8, 2020
ESAL9, ESAL9-a, ESAL9-b, and CDAL9	polyurethane air filter line	March 3, 2021

Emission Source ID	Description	Start Date
ESCAROUSEL, ESCAROUSEL-a, and ESCAROUSEL-b	polyurethane dispensing and mold release operations	October 8, 2020 and March 6, 2021

Based on the earliest start date (October 8, 2020), it appears that M+H has complied with the 12-month submittal requirement by submitting the Permit Application .21A on August 24, 2021. All references to the requirement to submit a new permit application (i.e., Section 2.1 A.5 in the existing permit) will be removed with this permitting action.

b. 502(b)(10) change under 15A NCAC 02Q .0523

Per 15A NCAC 02Q .0523(a), DAQ allows in some circumstances applicants to make changes to a facility without modifying the Title V permit. Such changes are referred to as "502(b)(10)" changes. Per 02Q .0523(a)(3), such changes must be incorporated into the Title V permit the next time the permit is revised.

M+H used the 502(b)(10) process to modify Oil Filter Line 7 (ES No. ESOL7). In the existing permit, this source uses plastisol to create the filter body. M+H proposes to replace the plastisol forming process with a polyurethane one. M+H submitted emission calculations with the application (included here as Attachment 2). Based on the calculations, M+H expects a net decrease in emissions of volatile organic compounds (VOC) and a net increase in emissions of hazardous air pollutants (HAP), primarily ethylene glycol.

An applicant must confirm that a proposed 502(b)(10) change meets the definition in 02Q .0523(a) by filling out a checklist provided by DAQ. The following table examines each entry on DAQ's checklist:

502(b)(10) Qualification Checklist	Disallows 502(b)(10)?	Notes
This change does not violate any existing requirement in the current Title V air quality permit.	No	• ESOL7 is subject to MACT Subpart MMMM and a total HAP emission limit of 0.31 kilograms of organic HAP emitter per liter of coating applied. The proposed switch to polyurethane will not violate or change any emission limit associated with this rule. • ESOL7 is subject to formaldehyde and phenol emission limits under 02D .1100. The switch to polyurethane will not increase emissions of either of these pollutants. • ESOL7 is also subject to a PM limit under 02D .0515, an SO_2 limit under 02D .0516, and a VE limit under 02D .0521. The proposed change will not affect emission rates or emission limits for any of these pollutants. • The facility is subject to 250 tpy VOC limit for PSD Avoidance under 02Q .0317. Based on the emission calculations in Attachment 2, the proposed switch to polyurethane is expected to decrease potential emissions of VOC, therefore this limit will not be exceeded or changed.
This change does not cause emissions allowed under the permit to be exceeded.	No	
This change does not require a case-by-case determination (e.g. BACT)	No	• This facility is a minor source for PSD. The PSD applicability threshold for minor sources is an increase in potential emissions greater than 250 tpy. Based on the emission calculations in Attachment 2, VOC emissions are expected to decrease. Therefore, no BACT determination or PSD permit will be required.
This change is not a modification under Title I of the federal Clean Air Act.	No	

502(b)(10) Qualification Checklist	Disallows 502(b)(10)?	Notes
This change does not alter (modify or add to) any existing monitoring, reporting or recordkeeping provisions in my current permit.	No	• The facility currently demonstrates compliance with MACT Subpart MMMM using the "emission rate without add-on controls" option. The facility will continue to use this option after the proposed change. • The facility currently demonstrates compliance with the PSD Avoidance limit by calculating facility-wide VOC emissions using DAQ-approved methods. The facility will continue to calculate emissions in this way after the proposed change.
This change does not require a change to an existing permit term that was taken to avoid an applicable requirement. (e.g. PSD avoidance condition)	No	• The facility is subject to a 250 tpy VOC emission limit for PSD Avoidance. This limit will not be affected by the proposed change.
This change does not require a permit under the NC Toxics program.	No	• Based on the submitted emission calculations, the proposed change will not increase the emission rate of any toxic air pollutants.

Based on the above analysis, DAQ agrees that the proposed switch from plastisol to polyurethane in ESOL7 qualifies as a 502(b)(10) change. The following change will be made to the new Title V permit:

Emission Source ID	**Emission Source Description**	**Control Device ID**	**Control Device Description**
ESOL7 MACT MMMM	**One oil filter line (9,600 units per hour design capacity) with one natural gas-fired heat set oven, ~~one top cap electric induction oven, one bottom cap electric induction oven~~ one polyurethane dispensing operation, and one powder coating paint spray booth (IES-7)***		
ESOL7-a	One 2.0 million Btu per hour natural gas-fired heat set oven	CDOL7	One natural gas-fired recuperative thermal oxidizer (5.0 million Btu per hour heat input capacity)
~~ESOL7-b~~	~~One top cap electric induction plastisol curing oven~~	~~N/A~~	~~N/A~~
~~ESOL7-c~~	~~One bottom cap electric induction plastisol curing oven~~	~~N/A~~	~~N/A~~
ESOL7-d	One polyurethane dispensing operation	N/A	N/A

c. Summary of Changes

The following table summarizes the changes made to the existing permit:

Page No.	Section	Description of Changes
Throughout	Throughout	• Updated dates and permit numbers. • Corrected formatting and updated wording to current DAQ standard where appropriate. There are no changes to compliance requirements based on these corrections and updates. • Corrected facility mailing address based on application. • Updated authorized official based on application.
4 - 8	1	• Based on application 2600058.20E: o Removed ESOL7-b and ESOL7-c o Added ESOL7-d • Based on application 2600058.21A: o Removed all references to permit application requirements under 02Q .0501(b)(2) because the Permittee has satisfied these requirements. o Removed reference to "electric heat set oven" from ESCART1 because this oven is now associated with ESGL1. This change should have been included in the previous Title V permit, but was overlooked at that time.
10	2.1 A.1.d	• Changed requirements for updating operating parameters for the recuperative thermal oxidizers. The Permittee must submit an application to update the permit to reflect any new tested values. The requirements for the permit application can be found in Section 2.1 A.1.d.iv.
12	2.1 A.3.d	• Removed requirement to establish "normal" visible emissions because the Permittee has completed this requirement.
n/a	2.1 A.5 (former)	• Removed this condition because the Permittee has satisfied the requirement to submit a permit application
27	2.3	• Noted that IS-BO and IS-WD are natural gas-fired.
28	3.	• Updated General Conditions to v6.0

Doublecheck before final issuance

5. Compliance Status and Other Regulatory Concerns:

- *Compliance status*: This facility was most recently inspected on December 8, 2020 by Evangelyn Lowery-Jacobs. M+H appeared to be in compliance with the Title V permit during that inspection.

- *Compliance history since previous Title V permit renewal*:

I. 04/28/20 NOV issued because the combustion zone temperature of the recuperative Thermal Oxidizer CDOL4-b was not maintained at or above 1,126°F (3-hour rolling average) during three consecutive monitoring periods when the heat set oven was processing paper on July 22, 2019. In addition, the facility did not submit a quarterly deviation summary report for the noted temperature excursion as required by the permit.

II. 08/21/19 NOV issued for excessive RTO monitor downtime for CDOL5-b, CDOL7, and CDOL8.

III. 04/09/19 NOV issued for excessive RTO monitor downtime for CDOL2. The violation was resolved on 04/26/19.

- *Application fee*: Applications for significant modification require an application fee. M+H paid the required fee for application .21A. Applications for 502(b)(10) modifications do not require an application fee.

- *PE Seal*: Pursuant to 15A NCAC 02Q .0112 "Application requiring a Professional Engineering Seal," a professional engineer's seal (PE seal) is required to seal technical portions of air permit applications for new sources and modifications of existing sources as defined in Rule .0103 of this Section that involve:

  (1) design;
  (2) determination of applicability and appropriateness; or
  (3) determination and interpretation of performance; of air pollution capture and control systems.

  A PE Seal was **NOT** required for the .21A application because the need for a PE seal was addressed in the Part 1 application (applications .20C & .20D). A PE Seal was **NOT** required for the .20E application because no new control device was added as part of the modification.

- *Zoning*: A Zoning Consistency Determination per 02Q .0304(b) was **NOT** required for the .21A application because this was addressed in the Part 1 application (applications .20C & .20D). A zoning consistency determination was **NOT** required for the .20E application because no new facility expansion took place.

- *Other regulatory concerns*: The permit conditions for MACT Subpart ZZZZ and NSPS Subpart IIII should be re-examined during the next permit renewal.

6. Facility Emissions Review

a. Emission changes due to application 2600058.21A:

Changes to the potential emissions from this facility due to the two-step significant modification discussed in Section 4.a were addressed with the first step of the two-step significant modification. See Attachment 1 for details regarding that modification.

b. Emission changes due to application 2600058.20E:

In application .20E, M+H calculated the change in potential emissions when switching ESOL7 from plastisol to polyurethane. When calculating emissions while using plastisol, M+H assumed that 100% of VOC content would be emitted from the process. When calculating emissions while using polyurethane, M+H estimated the amount of methyl diisocyanate that would be emitted during the polyurethane curing process. M+H used this same calculation method with the .20C and .20D applications, and DAQ reviewed and approved those methods. See Attachment 1, Section VIII(2) for DAQ's previous approval of this method.

The calculations for the .20E application are included as Attachment 2. The table below is a summary of those calculations.

Total Emission Changes

Process	VOC Emissions (tons/yr)	MDI Emissions (tons/yr)	1,2 Benzathracene Emissions (tons/yr)	Ethylene Glycol Emissions (tons/yr)
Plastisol (Being Removed)	-91.51	0.00	-1.75	0
Polyurethane (Being Added)	9.05	0.00001	0.00	9.05
Change in Emissions	**-82.46**	**0.00001**	**-1.75**	**9.05**

c. Overview

- The table on the first page of this permit review presents the criteria pollutant (plus total HAP) from the latest available approved facility emissions inventory (CY2019). The HAP emitted in the largest quantity from the facility is phenol.

- This facility is a Title V facility due to actual VOC emissions greater than 100 tpy and potential individual/total HAP emissions greater than 10/25 tpy. The changes discussed above will not affect Title V applicability thresholds because this facility is already subject to Title V.

- This facility is a major source of HAP due to potential individual/total HAP emissions greater than 10/25 tpy. The changes discussed above will not affect HAP thresholds because this facility is already a major source of HAP.

- This facility is a minor source for PSD permitting it complies with a facility-wide PSD avoidance limit under 02Q .0317. The changes discussed above will not affect PSD applicability because the facility will continue to comply with the PSD avoidance limit.

7. Draft Permit Review Summary

A draft of the permit and this application review were sent to RCO staff on September 22, 2021. Below is a summary of comments received from RCO.

RCO comment 1: Typos throughout the draft permit and review.

Response: The indicated issues will be corrected.

RCO comment 2: The requirement to establish "normal" visible emissions has been removed from Section 2.1 A.3.d, but this is not discussed in the table of changes.

Response: This was removed because it was a one-time requirement and the facility has completed that requirement. This information has been added to the table of changes.

RCO comment 3: Section 2.1 A.1.D should be updated to reflect DAQ's most recent language for changing tested operating parameters.

Response: The suggested update has been incorporated into the permit.

RCO comment 4: The permit conditions for MACT Subpart ZZZZ and NSPS Subpart IIII do not use the DAQ standard wording. Updating these conditions now is outside the scope of the two current permit applications, but they should

be updated during the next renewal. The application review should mention this information.

Response: This information will be included in Section 5.

A draft of the permit and this application review were sent to SSCB, FRO, and M+H staff on December 2, 2021. On December 21, 2021, SSCB confirmed that there were no comments on the draft. On December 30, 2021, FRO confirmed that there were no comments on the draft. No response was received from M+H staff.

8. Public Notice, EPA Review, and Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice is provided to the public under 02Q .0521 above. South Carolina is an affected state.

- The Public Notice and EPA Review periods began on XXXX.
- The Public Notice period ended on XXXX.
- The EPA Review period ended on XXXX.

9. Recommendations

This permit application has been reviewed by NC DAQ to determine compliance with all procedures and requirements. NC DAQ has determined that this facility appears to be complying with all applicable requirements.

Recommend issuance of Permit No. 01757T30. FRO has received a copy of this permit and no comments were received, as described in Section 7.

Attachment 1 to Review of Applications 2600058.20E & .21A
MANN+HUMMEL Purolator Filters LLC:
Review of Applications 2600058.20C & .20D

In response to these applications, DAQ issued permit 01757T29 on September 9, 2020
(The information table on the first page of the review is omitted here. Page numbers in this attachment may differ from the original document due to formatting differences)

Review Engineer: David B. Hughes **Review Engineer's Signature: Date:** [Signed by David Hughes on the Permit Issue date]	**Comments / Recommendations:** **Issue** 01757/T29 **Permit Issue Date: September 9, 2020** **Permit Expiration Date: October 31, 2023**

I. Purpose of Applications

Application No. 2600058.20C

Air Permit Application No. **2600058.20C** was received on **May 15, 2020** for a significant modification pursuant to 15A NCAC 02Q .0501(b)(2) Part 1 to install a new air filter line (ID No. ESAL7) which will produce a polyurethane trapezoidal air filter product. The proposed trapezoidal air filter line will have the capacity to produce a maximum of 600 filters per hour. This proposed line will include one 0.17 million Btu per hour natural gas-fired Hoffman oven (ID No. ESAL7-a) and one 2.0 million Btu per hour natural gas-fired heat set oven (ID No. ESAL7-b) equipped with a control device, 1.32 million Btu per hour natural gas-fired afterburner (ID No. CDAL7).

The purpose of the ESAL7-a oven will be to add moisture for flexibility when pleating occurs; therefore, curing will not take place in this oven. Paper curing will occur in the ESAL7-b heat set oven, where production of the new air filter product will require the use of media that has a higher resin content than the media currently used in the air plant at the Fayetteville facility. The afterburner, CDAL7, installed on ESAL7-b heat set oven will be used to reduce any potential for visible emissions that may occur from the curing of this new media.

MANN + HUMMEL also plan to install one carousel polyurethane operation (ID No. ESCAROUSEL) with two carousel polyurethane dispensing operations (ID No. ESCAROUSEL-a) and two associated mold release spray operations (ID No. ESCAROUSEL-b) to support the new air filter line EASL7.

Application No. 2600058.20D

Air Permit Application No. **2600058.20D** was received on **July 17, 2020** for a significant modification pursuant to 15A NCAC 02Q .0501(b)(2) Part 1 to install two new air filter lines (ID Nos. ESAL8 and ESAL9) which will both produce a polyurethane-based air filter product. The proposed air filter lines will each have the capacity to produce a maximum of 1,000 filters per hour. These proposed air filter lines will each include one electric infrared preheat oven (ID Nos. ESAL8-a and ESAL9-a) and one 2.0 million Btu per hour natural gas-fired heat set oven (ID Nos. ESAL8-b and ESAL9-b). Both heat set ovens will be equipped with a 1.32 million Btu per hour natural gas-fired afterburner (ID Nos. CDAL8 and CDAL9).

The purpose of the ESAL8-a and ESAL9-a ovens will be to add moisture for flexibility when pleating occurs; therefore, curing will not take place in these ovens. These ovens are intended to increase temperature and moisture in the media to allow flexibility for the pleating process. Paper curing will

occur in the ESAL8-b and ESAL9-b heat set ovens, where production of the air filter product will require the use of media that has a higher resin content than media's currently being utilized in the air plant at the Fayetteville facility. The afterburners, CDAL8 and CDAL9, installed on ESAL8-b and ESAL9-b heat set ovens respectively, will be used to reduce potential for visible emissions that may occur from the curing of this new media.

MANN + HUMMEL also plan to install one carousel polyurethane operations (ID No. ESCAROUSEL) with two carousel polyurethane dispensing operations (ID No. ESCAROUSEL-a) and two associated mold release spray operations (ID No. ESCAROUSEL-b) to support the new air filter lines ESAL8 and ESAL9.

II. Facility Description

MANN+HUMMEL Purolator Filters LLC manufactures automotive oil filters, air filters, and fuel filters for original manufacturers (Toyota, Ford, Chrysler, etc.) and for the aftermarket (Purolator, Penske, etc.). The oil filter manufacturing process is a continuous process that begins with a bulk supply of filter paper on large rolls. The paper is cut to length, pleated and formed into shape. Filters are then baked or "heat set" in a continuous oven to cure the paper. Filters are then placed in metal cans and plastisol or polyurethane is used as an adhesive to hold the filter to the end caps. The adhesive materials then may be sealed or cured in a final cure oven.

Once the filters are cured, they go through automated dry powder spray booths for final finish. Fuel filters and air filters are produced in a similar method as the oil filters, including heat set and final cure steps, but using a different paper material. Air filters are formed into cylindrical shapes or rectangular shapes and are set into frames constructed of polyurethane or plastisol. In addition to processing the filter paper, Purolator creates the steel cans and end caps for its oil filters, which are processed by a series of hydraulic presses. Fugitive VOC emissions occur from the inks used to label the filters, paint used for touch-up applications and from the miscellaneous use of adhesives and clean-up solvents.

III. Application Chronology

October 17, 2018 – The Division of Air Quality (DAQ), Fayetteville Regional Office (FRO), received Permit Application No. **2600058.18A** which is the second step of a two-step, 02Q .0501(b)(2), Significant Modification. The application was deemed complete for processing.

November 9, 2018 – Air Toxics Dispersion Modeling Analysis was received.

November 20, 2018 – Air Quality Permit No. **01757T26** issued as a Title V renewal.

December 3, 2018 – Memorandum from Nancy Jones, Meteorologist II, Air Quality Analysis Branch (AQAB) stating that the results from the Air Toxics Modeling Analysis are acceptable.

April 5, 2019 – Memorandum from Nancy Jones (AQAB) with a revision to the December 3, 2018 memo on the review of the dispersion modeling analysis, received November 9, 2018.

August 1, 2019 – Air Permit No. **01757T27** issued as a Title V Significant Modification Part II.

November 21, 2019 – Evangelyn Lowery-Jacobs of the FRO completed the annual compliance inspection of the facility.

January 28, 2020 – DAQ received a Notification of Title V Permit 502(b)(10) applicability determination.

April 21, 2020 – DAQ received Permit Application **2600058.20B**, which is the first step of a two-step, 02Q .0501(b)(2), Significant Modification. The application was deemed complete for processing.

May 15, 2020 – DAQ received Permit Application **2600058.20C**, which is the first step of a two-step, 02Q .0501(b)(2), Significant Modification. The application was deemed complete for processing.

June 8, 2020 – Evangelyn Lowery-Jacobs of the FRO completed the annual compliance inspection of the facility.

June 26, 2020 - DRAFT permit sent to Permittee, Supervisor, FRO and Samir Parekh for comment. Edward Bledsoe II provided minor comments via e-mail on **June 29, 2020**. Christy Richardson provided comments on draft permit and review via e-mail on **June 30, 2020**. Samir Parekh and Fayetteville Regional Office had no comments.

July 9, 2020 – Air Permit No. **01757T28** issued as a Title V Significant Modification Part I.

July 17, 2020 – DAQ received Permit Application **2600058.20D**, which is the first step of a two-step, 02Q .0501(b)(2), Significant Modification. The application was deemed complete for processing. Air Toxics Dispersion Modeling Analysis was received.

August 17, 2018 – Memorandum from Mark Yoder, Meteorologist, Air Quality Analysis Branch (AQAB) stating that the results from the Air Toxics Modeling Analysis are acceptable.

August 19, 2020 - DRAFT permit sent to Permittee, Supervisor, FRO and Samir Parekh for comment. Christy Richardson provided comments on draft permit and review via e-mail on **August 20, 2020**. Samir Parekh and Fayetteville Regional Office had no comments

IV. Permit Modifications/Changes and ESM Discussion

Page	Section	Description of Change
Global	Global	-Updated the application number and complete date. -Updated permit revision number to T29. -Updated the issuance/effective dates of the permit.
Cover Letter	Cover Letter	-Updated PSD increment tracking statement.
5-7	Section 1 Table	-Added one polyurethane trapezoidal air filter line ESAL7. -Added one 0.17 million Btu per hour natural gas-fired Hoffeman oven ESAL7-a. -Added one 2.0 million Btu per hour natural gas-fired heat set oven ESAL7-b with control device, one natural gas-fired afterburner CDAL7. -Added footnote for two-step significant modification. -Added one polyurethane air filter production line ESAL8. -Added one electric infrared preheat oven ESAL8-a.

Page	Section	Description of Change
		-Added one 2.0 million Btu per hour natural gas-fired heat seat oven ESAL8-b with control device, one natural gas-fired afterburner CDAL8. -Added one polyurethane air filter production line ESAL9. -Added one electric infrared preheat oven ESAL9-a. -Added one 2.0 million Btu per hour natural gas-fired heat seat oven ESAL9-b with control device, one natural gas-fired afterburner CDAL9. -Added a Carousel polyurethane operation ESCAROUSEL. -Added two carousel polyurethane dispensing operations ESCAROUSEL-a. -Added two carousel mold release spray operations ESCAROUSEL-b. -Added footnote for two-step significant modification.
8	2.1 A	-Added one polyurethane trapezoidal air filter line ESAL7. -Added one polyurethane air filter production line ESAL8. -Added one polyurethane air filter production line ESAL9. -Added a Carousel polyurethane operation ESCAROUSEL.
8	2.1 A. Table	-Added one polyurethane trapezoidal air filter line ESAL7. -Added one polyurethane air filter production line ESAL8. -Added one polyurethane air filter production line ESAL9. -Added a Carousel polyurethane operation ESCAROUSEL.
8	2.1 A.1.a	-Added one polyurethane trapezoidal air filter line ESAL7. -Added one polyurethane air filter production line ESAL8. -Added one polyurethane air filter production line ESAL9. -Added a Carousel polyurethane operation ESCAROUSEL.
9	2.1 A.1.c	-Added Particulate matter from the natural gas-fired heat set oven (ID No. ESAL7-b) shall be controlled by the natural gas-fired afterburner (ID No. CDAL7). -Added Particulate matter from the natural gas-fired heat set oven (ID No. ESAL8-b) shall be controlled by the natural gas-fired afterburner (ID No. CDAL8). -Added Particulate matter from the natural gas-fired heat set oven (ID No. ESAL9-b) shall be controlled by the natural gas-fired afterburner (ID No. CDAL9).
10	2.1 A.2.a	-Added one polyurethane trapezoidal air filter line ESAL7. -Added one polyurethane air filter production line ESAL8. -Added one polyurethane air filter production line ESAL9.
10 and 11	2.1 A.3.b and d	-Added one polyurethane trapezoidal air filter line ESAL7. -Added one polyurethane air filter production line ESAL8. -Added one polyurethane air filter production line ESAL9.
18	2.1 A.5.a and b	-Added one polyurethane trapezoidal air filter line ESAL7 with two natural gas-fired ovens ESAL7-a and ESAL7-b, one polyurethane air filter production line ESAL8 with one electric infrared preheat oven ESAL8-a and one natural gas-fired oven ESAL8-b, one polyurethane air filter production line ESAL9 with one electric infrared preheat oven ESAL9-a and one natural gas-fired oven ESAL9-b, and a carousel polyurethane operation ESCAROUSEL with two carousel polyurethane dispensing operations ESCAROUSEL-a and two carousel mold

Page	Section	Description of Change
		release spray operations ESCAROUSEL-b to 15A NCAC 02Q 0504 Option for Obtaining Construction and Operation Permit.
24	2.2 A.1.a Table	-Added one 0.17 million Btu per hour natural gas-fired Hoffman oven ESAL7-a limits for formaldehyde and phenol. -Added one 2.0 million Btu per hour natural gas-fired heat set oven ESAL7-b limits for formaldehyde and phenol. -Added one 2.0 million Btu per hour natural gas-fired heat set oven ESAL8-b limits for formaldehyde and phenol. -Added one 2.0 million Btu per hour natural gas-fired heat set oven ESAL9-b limits for formaldehyde and phenol.
26-34	Section 3.0 General Conditions	-Updated shell conditions to (v5.5 08/25/2020).

There were significant modifications to the equipment descriptions needed in Title V Equipment Editor (TVEE).

V. Regulatory Review

The facility is currently subject to the following regulations:

15A NCAC 02D .0515, Particulates from Miscellaneous Industrial Process
15A NCAC 02D .0516, Sulfur Dioxide Emissions from Combustion Sources
15A NCAC 02D .0521, Control of Visible Emissions
15A NCAC 02D .1100, Control of Toxic Air Pollutants *(State-Enforceable Only)*
15A NCAC 02D .1806, Control of Odorous Emissions *(State-Enforceable Only)*

**A. Six Oil Filter Lines (ID Nos. ESOL2 through ESOL5, ESOL7 and ESOL8) with associated recuperative thermal oxidizers (ID Nos. CDOL2 through CDOL8);
One Oil Cartridge Filter Line (ESCART1);
One Fuel Filter Line (ID No. ESGL1);
Eight Air Filter Lines (ID Nos. ESAL4, ESAL5, ESAL7, ESAL8, ESAL9, ESPCELL1, ESPCELL2, and ESPCELL3); and
One Carousel Polyurethane Operation (ID No. ESCAROUSEL)**

1. 15A NCAC 02D .0515 – Particulates From Miscellaneous Industrial Processes – Emissions of particulate matter from the oil, fuel, and air filter lines **(ID Nos. ESOL2 through ESOL5, ESOL7, ESOL8, ESCART1, ESGL1, ESAL4, ESAL5, ESAL7, ESAL8, ESAL9, ESPCELL1, ESPCELL2, ESPCELL3, and ESCAROUSEL)** shall not exceed an allowable emission rate as calculated by the following equation:

   $E = 4.10 \times P^{0.67}$ Where E = allowable emission rate in pounds per hour
   P = process weight in tons per hour

   Liquid and gaseous fuels and combustion air are not considered as part of the process rate.

   One Polyurethane Trapezoidal Air Filter Line (ID No. ESAL7) with two natural gas-fired ovens (ID Nos. ESAL7-a and ESAL7-b)

   MANN + HUMMEL state in their application (2600058.20C) that they are installing a new polyurethane trapezoidal air filter line (ID No. ESAL7) with one 0.17 million Btu per hour

natural gas-fired Hoffman oven (ID No. ESAL7-a) and one 2.0 million Btu per hour natural gas-fired heat set oven (ID No. ESAL7-b) equipped with a control device, 1.32 million Btu per hour natural gas-fired afterburner (ID No. CDAL7). The maximum throughput for ESAL7 is 600 parts per hour and the largest filter produced on this line is 0.75 pounds per part (0.225 tons per hour). Using the equation provided above, the allowable PM emission rate for air filter line ESAL7 would be 1.51 pounds per hour. The potential PM emissions from ESAL7 are 1.40 pounds per hour, which is less than the allowable limit.

Two Polyurethane Air Filter Production Lines (ID Nos. ESAL8 and ESAL9) with one electric infrared preheat oven (ID Nos. ESAL8-a and ESAL9-a) each and one natural gas-fired heat set oven (ID Nos. ESAL8-b and ESAL9-b) each and Carousel Polyurethane Operation (ID No. ESCAROUSEL) with two carousel polyurethane dispensing operations (ID No. ESCAROUSEL-a) and two mold release spray operations (ID No. ESCAROUSEL-b)

MANN + HUMMEL state in their application (2600058.20D) that they are installing two new air filter lines (ID Nos. ESAL8 and ESAL9). These new air filter lines will each include one electric infrared preheat oven (ID Nos. ESAL8-a and ESAL9-a) and one 2.0 million Btu per hour natural gas-fired heat set oven (ID Nos. ESAL8-b and ESAL9-b). Both heat set ovens will be equipped with a 1.32 million Btu per hour natural gas-fired afterburner (ID Nos. CDAL8 and CDAL9). MANN + HUMMEL also plans to install two carousel polyurethane dispensing operations (ID No. ESCAROUSEL-a) and two associated mold release spray operations (ID No. ESCAROUSEL-b) to support the new air filter lines ESAL8 and ESAL9 and air filter line ESAL7. The maximum throughput for ESAL8 and ESAL9 is 1,000 parts per hour each and the largest filter produced on these lines is 0.50 pounds per part (0.25 tons per hour). Using the equation provided above, the allowable PM emission rate for each proposed line would be 1.62 pounds per hour. The potential PM emissions from ESAL8 and ESAL9, without taking potential control efficiencies into account, are 1.56 pounds per hour each, which is less than the allowable limit.

Using AP-42 emission factors, PM emissions from natural gas are estimated be as follows:

AP-42 emission factor for natural gas = 7.6 lbs total PM/million standard cubic feet
AP-42 heat value for natural gas = 1,020 million Btu

$$\frac{7.6\ lbs\ PM_{Total}}{10^6\ scf} \times \frac{1\ x\ 10^6\ scf}{1{,}020\ mmBtu} = \frac{0.007\ lbs\ PM_{Total}}{mmBtu}$$

No monitoring, recordkeeping, or reporting shall be required to demonstrate compliance with this limitation. Compliance is indicated, as natural gas combustion results in negligible particulate matter emissions.

2. 15A NCAC 02D .0516– Sulfur Dioxide Emissions From Combustion Sources – Sulfur dioxide emissions from **ESAL7, ESAL8, and ESAL9** are limited to 2.3 pounds per million But heat input.

Using AP-42 emission factors, SO_2 emissions from natural gas are estimated to be less than 2.3 lb/MM/Btu, as follows:

AP-42 emission factor for natural gas = 0.6 lbs /million standard cubic feet
AP-42 heat value for natural gas = 1,020 million Btu

$$\frac{0.6\ lbs}{1\ x\ 10^6\ scf} \times \frac{1\ x\ 10^6\ scf}{1{,}020\ mmBtu} = \frac{0.0006\ lb\ SO_2}{mmBtu}$$

Because worst case SO_2 emission rates are estimated to be less than the allowable SO_2 emission rate (2.3 lb SO_2/mmBtu), no monitoring recordkeeping, or reporting shall be required to demonstrate compliance with this limitation. Compliance is indicated, as natural gas combustion results in negligible sulfur dioxide emissions.

3. 15A NCAC 02D .0521 – Control of Visible Emissions – Visible emissions from **ESAL7, ESAL8, and ESAL9** are limited to 20 percent opacity. VE observations must be performed once a month for all sources for each stack for emissions above normal, observations recorded in a logbook, and a semi-annual summary report submitted. Compliance is indicated as no VE was observed during the last inspection.

4. 15A NCAC 02D .1806 – Control and Prohibition of Odorous Emissions – This regulation is applicable facility-wide and requires the facility to operate in a manner which does not cause nor contribute to objectionable odors beyond the facility's property boundary. DAQ inspectors have not noted any odors when entering/existing the site. Continued compliance is expected.

5. 15A NCAC 02Q .0317 Avoidance Conditions for 15A NCAC 02D .0530 PSD – This regulation allows facilities to request terms and conditions be placed in that facility's permit to avoid applicability, in this instance, for PSD. The Permittee has the potential to emit greater than 250 tons per year of VOC and has elected to obtain a federally enforceable permit limit to avoid being designated as a major stationary source and to avoid applicability of PSD permitting. MANN + HUMMEL shall continue to demonstrate compliance with this facility-wide PSD avoidance limit. The new sources are emitters of VOCs and as such the Permittee will include these emissions in all calculations to ensure compliance with PSD avoidance condition.

Permit Application Submittal Requirement

1. **15A NCAC 02Q .0504: OPTION FOR OBTAINING CONSTRUCTION AND OPERATION PERMIT**

Permitting [15A NCAC 02Q .0504(d)]

a. As required under 15A NCAC 02Q .0501(b)(2), the Permittee shall have one year from the date of beginning normal operation of the sources identified in application Nos. 2600058.20C and 20D, to file an amended application following the procedures of Section 15A NCAC 02Q .0504.

Reporting [15A NCAC 02Q .0508(f)]

b. The Permittee shall notify the Regional Office, in writing, of the date of beginning normal operation of the project consisting of sources identified in application Nos. 2600058.20C and 20D postmarked no later than 30 days after such date.

VI. NSPS, NESHAPS/MACT, PSD, 112(r), CAM

NSPS

The Permittee is currently not subject to any New Source Performance Standards (NSPS). These modification(s) do not affect this status.

NESHAPS/MACT

The Permittee is subject to 15A NCAC 02D .1111: Maximum Achievable Control Technology (MACT), 40 CFR Part 63, Subpart DDDDD "National Emissions Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters". The four natural gas-fired ovens, ESAL7-a, ESAL7-b, ESAL8-b and ESAL9-b are not subject to the requirements of this subpart because they are direct-fired units which do not meet the definition of boiler or process heater in §63.7570; therefore, this regulation does not apply to these emission sources. They are also subject to 40 CFR Part 63, Subpart MMMM "National Emission Standards for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products". The new ESAL7, ESAL8 and ESAL9 air filter lines, polyurethane dispensing operations ESCAROUSEL-a and mold release spray operations ESCAROUSEL-b are not subject to the requirements of this regulation since they do not apply surface coating to metal parts or products. These permit modification(s) do not affect this status.

PSD

Implementation of the Prevention of Significant Deterioration (PSD) regulations has been delegated in full to the State of North Carolina. These air quality regulations are contained in 15A NCAC 02D .0530 "Prevention of Significant Deterioration (PSD)". The PSD regulations apply to new sources designated as "major" by the PSD regulations or by existing major sources undergoing a major modification. The regulations require that new major sources, or modifications at existing major sources that result in a net emissions increase of any regulated compound above its respective de minimis (i.e., significance) level, undergo a thorough PSD review and obtain a PSD permit prior to beginning construction. A source is considered major if it belongs to any one of the 26 source categories listed in the PSD regulations and if it has the potential to emit more than 100 tons per year of any PSD-regulated compound, or any other source which has the potential to emit more than 250 tons per year of any PSD compound.

The facility has the potential to emit greater than 250 tons per year of VOC, MANN + HUMMEL has accepted an emission limitation of 250 tons per year (tpy) for VOCs to avoid PSD permitting, and the permit contains a 15A NCAC 02Q .0317 PSD Avoidance condition. The PSD avoidance limit will remain as is currently permitted: To avoid the applicability of 15A NCAC 02D .0530, the Permittee shall limit facility-wide VOC emissions to less than 250 tons for any consecutive 12-month period. The combined VOC emissions increases associated with these two applications do no exceed major source threshold. These permit modification(s) do not affect this status.

112(r) – The facility is not subject to Section 112(r) of the Clean Air Act requirements because it does not store one or more of the regulated substances in quantities above the thresholds in the Rule. These permit modification(s) do not affect this status.

CAM

Pursuant to 40 CFR 64.2, the provisions of the Compliance Assurance Monitoring (CAM) rule are applicable to emission units that meet all of the following criteria:

Criteria #1: The unit is subject to an emission limitation AND uses a control device to achieve compliance with the limit;

Criteria #2: The unit has pre-control potential emissions that are equal to or greater than 100% of the amount (in tpy) required for a source to be classified as a major source (i.e., 100 tpy of any criteria pollutant or 10 tpy of any HAP); and,
Criteria #3: The unit is not exempt under 40 CFR 64.2(b).

There will be no sources added from either application that will require utilization of a control device to achieve compliance with an applicable pollutant specific emission limit or standard (visible emissions only) and have uncontrolled emissions of a regulated air pollutant greater than 100 tons per year. Therefore, CAM does not apply. These permit modification(s) do not affect this status.

VII. Facility Wide Air Toxics

15A NCAC 02Q .0700: "Toxic Air Pollutant Procedures and 15A NCAC 02D .1100: "Control of Toxic Air Pollutants

The Toxic Air Pollutant (TAP) Procedures require a permit for any facility with emissions of a Toxic Air Pollutant listed in 15A NCAC 02D .1104 in excess of the applicable Toxic Pollutant Emission Rates (TPER) presented in 15A NCAC 02Q .0711.

The TPER Comparison Table in Table 1 below provides a summary of the proposed facility-wide emissions of TAPs following the changes from this project. As shown in the table, phenol and formaldehyde are still the only TAPs above the limits requiring a permitted emission rate. Air Permit No. 01757T28 currently includes emission source specific limits for both phenol and formaldehyde.

Table 1: TPER Comparison Table

Pollutant	15A NCAC 02Q .0711 TPERs			Facility Wide PTE Values			TPER Triggered		
Units	lb/yr	lb/day	lb/hr	lb/yr	lb/yr	lb/hr	lb/yr	lb/day	lb/hr
Formaldehyde	---	---	0.16	---	---	2.03	---	---	**Yes**
Phenol	---	---	1.00	---	---	5.15	---	---	**Yes**
Methyl ethyl ketone	---	155.80	93.19	---	8.39	0.35	---	No	No
n-Hexane	---	46.30	---	---	4.61	---	---	No	---
Toluene	---	197.96	58.97	---	0.83	0.03	---	No	No
Xylene	---	113.70	68.44	---	2.28	0.09	---	No	No
Styrene	---	---	11.16	---	---	0.03	---	---	No
Benzene	11.07	---	---	6.70	---	---	No	---	---
p-Dichlorobenzene	---	---	69.50	---	---	0.0001	---	---	No

Emissions of formaldehyde and phenol are expected to occur from the proposed new air lines. The increased potential emissions of those two toxic air pollutants (TAP) contribute to site-wide levels that require evaluation for compliance with the NCDEQ air toxics program. This evaluation entails conducting dispersion modeling to predict ambient air concentrations at the property boundary and in the surrounding areas.

ERM conducted an air dispersion modeling analysis of the potential emissions of formaldehyde and phenol from the new equipment using the EPA and NCDEQ recommended AERMOD air dispersion modeling system. The modeling report presents the predicted maximum ambient air concentrations

of potential TAP resulting from operating the new air lines in addition to MANN + HUMMEL's existing permitted sources of these TAP.

For the modeling analysis, the facility used uncontrolled potential to emit and applied a multiplier of two for formaldehyde emissions and a multiplier of five for phenol emissions to estimate emissions beyond worst-case.

The emission rates used for the modeling analysis are as follows:

Emission Source ID	**Formaldehyde Emission Rate lb/hr**	**Phenol Emission Rate lb/hr**
ESOL2-a	0.15	3.33
ESOL3-a	0.10	2.23
ESOL4-a	0.052	1.12
ESOL4-b	0.052	1.12
ESOL4-c and d	0.0019	0.022
ESOL5-a	0.052	1.12
ESOL5-b	0.052	1.12
ESOL7-a	0.15	3.33
ESOL8-a	0.068	1.46
ESGL1-b	0.019	0.42
ESGL1-c	0.019	0.42
ESAL4-aR	2.04×10^{-5}	-
ESAL4-b	0.35	0.43
ESAL4-c	1.02×10^{-4}	-
ESAL7-a	2.48×10^{-5}	-
ESAL7-b	0.51	2.47
ESAL8-b	0.57	2.75
ESAL9-b	0.57	2.75
ESPCELL1-a	4.37×10^{-5}	-
ESPCELL1-b	0.44	0.55
ESPCELL2-a	3.64×10^{-5}	-
ESPCELL2-b	0.44	0.55
ESPCELL3-a	4.37×10^{-5}	-
ESPCELL3-b	0.44	0.55

The submitted air pollutant dispersion modeling analysis (July 17, 2020) was reviewed and approved by Mark Yoder, DAQ AQAB, on August 17, 2020 which resulted in the following impacts:

Pollutant	Averaging Period	Concentration at Property Boundary $\mu g/m^3$	AAL $\mu g/m^3$	% AAL
Formaldehyde	1-hour	125	150	83%
Phenol	1-hour	360	950	38%

Since none of the toxic air pollutants emitted exceed either their respective TPER or subsequent AAL, DAQ has determined that there is not an unacceptable risk to human health resulting from activities at the facility. The emission limitations in the 02D .1100 stipulation have been updated in Air Permit No. 01757T29.

VIII. Facility Emissions Review

One Polyurethane Trapezoidal Air Filter Line (ID No. ESAL7) with two natural gas-fired ovens (ID Nos. ESAL7-a and ESAL7-b)

The updated facility wide potential to emit (PTE), before and after controls, for criteria and Hazardous Air Pollutants (HAPs) is presented in the Table below. The facility's potential emissions have been updated to include the new sources and increased production as a result of this project. In order to accurately represent current operations at the facility, 2018 production data and operating hours were used in the emission calculations for sources that were using a usage ratio to scale up to 8,760 hours, such as inks, fluids, and other evaporative sources.

Increases in emissions from this project are associated with paper curing, polyurethane usage, mold release usage, and natural gas combustion. Each section includes a description of the methodologies used for calculating emissions from the respective sources.

Pollutant	Potential Before Controls / Limitations tons/year	Potential After Controls / Limitations tons/year
PM (TSP)	198.08	68.31
PM_{10}	177.28	61.02
$PM_{2.5}$	177.28	61.02
SO_2	0.99	0.99
NOx	54.24	54.24
CO	38.56	38.56
VOC	702	<250
Highest Individual HAP (Phenol)	18.68	10.00
Total HAP	41.06	25.72

(1) Paper Curing

The proposed heat set oven, ESAL7-b will result in an increase in emissions from paper curing operations. Paper curing operations generate emissions of PM, VOC, HAPs, and TAPs. Emission factors which provide emissions per ton of paper processed are utilized to calculate emissions from each respective line. The maximum number of filters that can be processed on the proposed air filter line is 600 parts per hour. The pounds of paper assumed per filter is based on the media weight of the largest filter which could be produced at relative speeds of the respective line.

Emission factors used to calculate emissions from this source are based on testing conducted by the media vendor who provided laboratory emissions data. Ahlstrom, the media vendor, was able to provide laboratory testing data for VOC emissions using the respective media and oven conditions replicative of the conditions at which ESAL7-b will operate at the Fayetteville facility. The following VOC data was provided by Ahlstrom:

- Formaldehyde = 0.57 g/kg paper (1.14 lb/ton media)
- Phenol = 1.1 g/kg paper (2.20 lb/ton media)

Therefore, VOC emissions from the curing process would be 3.34 pounds per tons of media processed. As shown in previous ESOL3 source testing, the vast majority of PM emissions would be

condensable (from the volatile organics), with only a small amount of filterable PM emissions. Using the December 2015 stack test results, filterable PM from the Oil Line ESOL3 was approximately 2.9 lb/ton media processed. Due to the media differences and process operating conditions, the filterable PM emissions from the air filter line, ESAL7-b, are expected to be significantly less than that of the oil lines. However, to be conservative, MANN + HUMMEL assumed that the filterable PM emissions from ESAL7-b are equal to that of the oil filter line.

A total PM emission factor for ESAL7-b was calculated using the VOC emissions factor from the vendor data (assumed to be equal to condensable particulate) and the filterable PM emission rate determined from the December 2015 stack testing on Oil Line ESOL3. The total PM emission factor which MANN + HUMMEL utilized for ESAL7-b is 6.24 lb/ton media processed (i.e., 3.34 lb/ton plus 2.9 lb/ton).

An afterburner, CDAL7, will be installed on ESAL7-b for the purposes of controlling visible emissions; however, MANN + HUMMEL has assumed no reduction in PM and VOC emissions as a result of the control device.

MANN + HUMMEL provided the information for paper curing. DAQ concurs with the material as presented.

(2) Polyurethane usage

Polyurethane will be applied to the filters produced on air filter line ESAL7 using the two proposed carousel polyurethane operations (ESCAROUSEL-a). ESCAROUSEL-a will primarily use two different types of polyurethane, one for each of the two operations. Increases of VOC and HAP emissions from the polyol portion of the polyurethane are calculated based on the amount of polyurethane usage from each operation and the percent volatilization of the polyurethane. The percent volatilization was obtained from laboratory testing conducted by the product vendor. Increases of VOC and HAP emissions from the iso portion are determined by utilizing the calculations in tab M5a of the American Chemical Council's MDI/PDMI Emission Calculator.

MANN + HUMMEL provided the information for polyurethane usage. DAQ concurs with the material as presented.

(3) Mold release usage

Due to the increase in filter production associated with the proposed air filter line, ESAL7, emissions from mold release agents are expected to increase as well. Additional usage of mold release (Purac15060) was calculated using a factor of 6.04x10-3 pounds of mold release per part and then multiplying by the maximum number of filters produced per hour (600) and conservatively assuming 5,000 hours of operation based off of 2018 operating hours from the facility. Increases from additional mold release usage is accounted for under the Plant Fugitive Emissions in the detailed calculations.

MANN + HUMMEL provided the information for mold release usage. DAQ concurs with the material as presented.

(4) Natural gas usage

There are emission increases from natural gas as associated with the proposed natural gas-fired ovens, ESAL7-a and ESAL7-b, as well as the natural gas-fired afterburner, CDAL7. The maximum heat

input rating for each of these sources was provided by the vendor and emissions were calculated using AP-42 emission factors for combustion of natural gas.

MANN + HUMMEL provided the information for natural gas usage. DAQ concurs with the material as presented.

Two Polyurethane Air Filter Production Lines (ID Nos. ESAL8 and ESAL9) with one electric infrared preheat oven (ID Nos. ESAL8-a and ESAL9-a) each and one natural gas-fired heat set oven (ID Nos. ESAL8-b and ESAL9-b) each and Carousel Polyurethane Operation (ID No. ESCAROUSEL) with two carousel polyurethane dispensing operations (ID No. ESCAROUSEL-a) and two mold release spray operations (ID No. ESCAROUSEL-b)

The updated facility wide potential to emit (PTE), before and after controls, for criteria and Hazardous Air Pollutants (HAPs) is presented in the Table below. The facility's potential emissions have been updated to include the new sources and increased production as a result of this project. In order to accurately represent current operations at the facility, 2018 production data and operating hours were used in the emission calculations for sources that were using a usage ratio to scale up to 8,760 hours, such as inks, fluids, and other evaporative sources.

Increases in emissions from this project are associated with paper curing, polyurethane usage, mold release usage, and natural gas combustion. Each section includes a description of the methodologies used for calculating emissions from the respective sources.

Pollutant	Potential Before Controls / Limitations tons/year	Potential After Controls / Limitations tons/year
PM (TSP)	205.69	79.87
PM_{10}	185.82	73.03
$PM_{2.5}$	185.82	73.03
SO_2	1.02	1.02
NOx	57.89	57.89
CO	41.63	41.63
VOC	660	<250
Highest Individual HAP (Phenol)	22.55	14.74
Total HAP	60.54	45.57

(1) **Paper Curing**

The proposed heat set ovens, ESAL8-b and ESAL9-b will result in an increase in emissions from paper curing operations. Paper curing operations generate emissions of PM, VOC, HAPs, and TAPs. Emission factors which provide emissions per ton of paper processed are utilized to calculate emissions from each respective line. The maximum number of filters that can be processed on the proposed air filter line is 1000 parts per hour. The pounds of paper assumed per filter is based on the media weight of the largest filter which could be produced at relative speeds of the respective line.

Emission factors used to calculate emissions from this source are based on testing conducted by the media vendor who provided laboratory emissions data. Ahlstrom, the media vendor, was able to provide laboratory testing data for VOC emissions using the respective media and oven conditions

replicative of the conditions at which ESAL8-b and ESAL9-b will operate at the Fayetteville facility. The following VOC data was provided by Ahlstrom:

- Formaldehyde = 0.57 g/kg paper (1.14 lb/ton media)
- Phenol = 1.1 g/kg paper (2.20 lb/ton media)

Therefore, VOC emissions from the curing process would be 3.34 pounds per tons of media processed. As shown in previous ESOL3 source testing, the vast majority of PM emissions would be condensable (from the volatile organics), with only a small amount of filterable PM emissions. Using the December 2015 stack test results, filterable PM from the Oil Line ESOL3 was approximately 2.9 lb/ton media processed. Due to the media differences and process operating conditions, the filterable PM emissions from the air filter lines, ESAL8-b and ESAL9-b, are expected to be significantly less than that of the oil lines. However, to be conservative, MANN + HUMMEL assumed that the filterable PM emissions from ESAL8-b and ESAL9-b are equal to that of the oil filter line.

A total PM emission factor for ESAL8-b and ESAL9-b was calculated using the VOC emissions factor from the vendor data (assumed to be equal to condensable particulate) and the filterable PM emission rate determined from the December 2015 stack testing on Oil Line ESOL3. The total PM emission factor which MANN + HUMMEL utilized for ESAL8-b and ESAL9-b is 6.24 lb/ton media processed (i.e., 3.34 lb/ton plus 2.9 lb/ton) for each line.

Afterburners, CDAL8 and CDAL9, will be installed on each respective heat set oven ESAL8-b and ESAL9-b, for the purposes of controlling visible emissions; however, MANN + HUMMEL has assumed no reduction in PM and VOC emissions as a result of the control device.

MANN + HUMMEL provided the information for paper curing. DAQ concurs with the material as presented.

(2) **Polyurethane usage**

Polyurethane will be applied to the filters produced on both of the proposed air filter lines, ESAL8 and ESAL9, using the two proposed carousel polyurethane operations (ESCAROUSEL-a). ESCAROUSEL-a will primarily use two different types of polyurethane, one for each of the two operations. Increases of VOC and HAP emissions from the polyol portion of the polyurethane are calculated based on the amount of polyurethane usage from each operation and the percent volatilization of the polyurethane. The percent volatilization was obtained from laboratory testing conducted by the product vendor. Increases of VOC and HAP emissions from the iso portion are determined by utilizing the calculations in tab M5a of the American Chemical Council's MDI/PDMI Emission Calculator.

MANN + HUMMEL provided the information for polyurethane usage. DAQ concurs with the material as presented.

(3) **Mold release usage**

Emissions from mold release agents will increase as a result of the two new proposed mold release spray operations (ESCAROUSEL-b). Emissions from the new mold release was calculated using the maximum mold release usage per part and then multiplying by the maximum number of filters produced per hour (2,000 parts per hour for both operations, ESAL8-b and ESAL9-b).

MANN + HUMMEL provided the information for mold release usage. DAQ concurs with the material as presented.

(4) **Natural gas usage**

There are emission increases from natural gas as associated with the proposed natural gas-fired ovens, ESAL8-b and ESAL9-b, as well as the natural gas-fired afterburners, CDAL8 and CDAL9. The maximum heat input rating for each of these sources was provided by the vendor and emissions were calculated using AP-42 emission factors for the combustion of natural gas.

MANN + HUMMEL provided the information for natural gas usage. DAQ concurs with the material as presented.

See Table in the header for a summary of the actual emissions as reported to DAQ from the years 2014 to 2018.

Potential emissions, before and after controls, are from the permit applications (Nos. 2600058.20C and 2600058.20D). Particulate, VOC, and HAP calculations resulting from the analysis of emissions from the fuel and air filter lines discussed in Section V were updated and included in the totals above.

IX. Stipulation Review

The facility was last inspected by Evangelyn Lowery-Jacobs on **June 8, 2020**. Based on her observations the facility appeared to be in compliance with their Title V permit requirements.

Compliance History (5-year)

04/28/20	NOV issued because the combustion zone temperature of the recuperative Thermal Oxidizer CDOL4-b was not maintained at or above 1,126°F (3-hour rolling average) during three consecutive monitoring periods when the heat set oven was processing paper on July 22, 2019. In addition, the facility did not submit a quarterly deviation summary report for the noted temperature excursion as required by the permit.
08/21/19	NOV issued for excessive RTO monitor downtime for CDOL5-b, CDOL7, and CDOL8.
04/09/19	NOV issued for excessive RTO monitor downtime for CDOL2. The violation was resolved on 04/26/19.
09/21/18	NOD issued for deviations from the minimum RTO temperature requirements, and excessive RTO monitor downtime for CDOL2 and CDOL7.
05/04/18	Letter issued to the facility indicating that the requirements of SOC 2016-003 were satisfied.
12/13/17	Civil penalty in the amount of $5,497 assessed for visible emissions violations associated with NOV/NRE issued on 05/23/17. The penalty was paid in full on 03/05/18.
05/23/17	NOV/NRE issued for failure to conduct visible emissions monitoring.

12/01/16 SOC 2016-003 active. The previously assessed civil penalty of $20,183 was paid in full as an upfront penalty.

05/19/16 Civil penalty in the amount of $20,183 assessed for visible emissions violations associated with NOV/NRE letters issued on 02/23/16 and 04/25/16.

04/25/16 NOV/NRE issued for a failed source test indicating excess particulate emissions from oil line ESOL3.

02/23/16 NOV/NRE issued for excessive visible emissions from filter lines ESOL3 and ESOL4, failure to conduct visible emissions monitoring, failure to conduct monthly inspections of VOC-utilizing processes, failure to submit semi-annual reports, and failure to keep appropriate material use records.

06/03/15 Civil penalty in the amount of $6,420 assessed for visible emissions violations associated with NOV/NRE issued on 05/06/15. The penalty was paid in full on 07/02/15.

05/12/15 NOD issued for failure to keep records of inspections and maintenance for emergency generator ES-EG2.

05/06/15 NOV/NRE issued for excessive visible emissions from filter lines ESOL7 and ESCART1.

X. Affected State(s) Review

No public comment period is necessary for Part 1 501 (b)(2) process. The second step application due within 12 months of start-up of the new equipment will require public notice and review prior to issuance.

XI. Conclusions, Comments, and Recommendations

A professional engineer's seal was submitted with these significant modification(s) Part 1.

A zoning consistency determination was submitted with these significant modification(s) Part 1.

FRO recommends issuance of the permit and was sent a DRAFT permit prior to issuance (See Section III of this document for a discussion).

RCO concurs with FRO recommendation to issue these significant modification(s) air permit.

Attachment 2 to Review of Applications 2600058.20E & .21A
MANN+HUMMEL Purolator Filters LLC:
Potential Emission Calculations for ESOL7

The following calculations were performed by M+H and included in application .20E.
Note that DAQ has previously accepted this calculation method. See DAQ's review of applications 2600058.20C & .20D and associated Title V permit 01757T29.

Plastisol Emissions
Uncontrolled Emissions

Source	Stack ID	Total Filters Produced	lb/filter	Total lbs Plastisol	Criteria Pollutants Emissions				HAP/TAP Pollutant Emissions			
					VOC				1,2 Benzathracene			
					%wt	(lb/hr)	(lb/yr)	(tons/yr)	%wt	(lb/hr)	(lb/yr)	(tons/yr)
ESOL7-b/c	7OL2 and 7OL3	84,096,000	0.0606	5,095,208	3.592%	20.89	183,020	91.51	0.0688%	0.40	3505.5	1.75

Polyurethane Emissions
ISO Portion

Emission Point ID	Chemical Description	Poly Part No.	Line Type	Filters Produced	Surface Area of End Caps	Surface Area of End Caps	% MDI in MDI/PMDI	% of Iso to Polyol	Evaporation rate without considering reaction and filteration	Total Volume of Released	MDI/VOC Emissions		
					ft^2/yr	m^2/yr	%	%	(g/hr)	(ft^3/yr)	(lb/hr)	(lb/yr)	(tons/yr)
ESOL7-b/c	ISO 9800-C	83742055	Oil	84,096,000	5,755,726	534,724	50	50	3.30E+01	---	2.24E-06	1.96E-02	9.82E-06

Oil Filter Lines (Open Process)	
Estimated curing time (hours)	1
Air velocity over the product before curing (ft/sec)	1.8
Temperature (F)	78
Estimated first order reaction rate of MDI/pMDI with polyol (1/hr)	3.6
Airflow speed, converted to miles/hr	1.2
Temperature (K)	298.6
Temperature (C)	25.6
Diffusivity in air (ft^2/sec)	5.82E-05
Molecular weight of MDI (g/mol)	250.26
gas phase mass transfer coefficient for MDI (m/sec)	5.13E-04
Atmospheric pressure (Pa)	101325
Ideal gas constant (Pa m^3 / mol * K)	8.31
MDI vapor pressure based on temperature (Pa)	1.33E-03

Polyol Portion

Emission Point ID	Chemical Description	Poly Part No.	Line Type	Lbs. Used[1]	VOC Content[2]	Ethylene Glycol Content	Ethylene Glycol			VOC		
					%	%	(lb/hr)	(lb/yr)	(tons/yr)	(lb/hr)	(lb/yr)	(tons/yr)
ESOL7-b/c	Baytec PA 7101	87761682	Oil	2,966,402	0.6%	0.6%	2.07	18095.05	9.05	2.07	18,095.05	9.05

[1] *Assumes 8 grams per cap, 2 caps per filter.*

[2] *VOC content was obtained from supplier VOC sampling analysis and assumes temperature of 110° C; however, actual operating temperature is 30° C. (Memo dated 9/10/2020)*

Total Emission Changes

Process	VOC Emissions (tons/yr)	MDI Emissions (tons/yr)	1,2 Benzathracene Emissions (tons/yr)	Ethylene Glycol Emissions (tons/yr)
Plastisol (Being Removed)	-91.51	0.00	-1.75	0
Polyurethane (Being Added)	9.05	0.00001	0.00	9.05
Change in Emissions	**-82.46**	**0.00001**	**-1.75**	**9.05**