

From: [Air.Pollution Control](#)
To: [APC Permitting](#)
Subject: FW: Adient Pulaski Air Permitting History
Date: Wednesday, September 8, 2021 7:34:13 AM
Attachments: [Air Permitting History Final 8-24-21.docx](#)

From: Jill Pratt <Jill.Pratt@tn.gov>
Sent: Wednesday, September 8, 2021 6:06 AM
To: Air.Pollution Control <Air.Pollution.Control@tn.gov>
Subject: FW: Adient Pulaski Air Permitting History

I believe they meant to send this to you vs. the emissions inventory email address.

From: Kris Patrick Foster <kris.patrick.foster@adient.com>
Sent: Tuesday, September 7, 2021 3:05 PM
To: APC Inventory <APC.Inventory@tn.gov>
Cc: Jill Pratt <Jill.Pratt@tn.gov>
Subject: [EXTERNAL] Adient Pulaski Air Permitting History

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

Please find attached the requested Air Permitting History for Adient Pulaski in regards to the requested VOC limit increase and Title V Permit renewal.

Thank you,



Kris P. Foster

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Adient – INTERNAL

Air Permitting History – Discussion of VOC increases

Adient Pulaski, TN (Previously Johnson Controls)

September 7, 2021

Adient (the Company) is a primary supplier of foam seating components to numerous automobile manufacturers. The Company operates 3 moisture cure, urethane foam injection lines at the Pulaski, Tennessee facility. The three foam lines produce automotive seat cushions in clamshell molds. Prior to injecting the foam components into the mold, the molds are sprayed with a wax mold release agent to allow removal of the cured foam. The mold release wax is suspended in an aliphatic, (non-halogenated) solvent which is the primary source of VOCs from the operation.

Prior to the COVID-19 pandemic, the Company requested a renewal of their site Title V air permit and a simultaneous increase in VOC emissions as a result of newly acquired automotive business. The Tennessee Division of Air Pollution Control has informed the Company the increase in VOC's will require a new source review (NSR) permit. They also indicated the increase may be subject to review under the federal prevention of significant deterioration (PSD) regulations found in 40 CFR Part 52.21. This package presents the NSR request and a discussion of facts with a request to review the increases by applying a retroactive permitting consideration commonly known as the [PSD] one-time-doubling. The Company believes a one-time-doubling of the 2004 allowed emissions is appropriate given:

- 1) No physical changes and no change in the method of operating the foam lines have occurred.
- 2) Attempts to use co-solvent (low VOC) mold release agents have resulted in the production of damaged parts, requiring remanufacturing and the wasting of raw materials to get suitable parts.
- 3) No historical consideration for the line potential emissions have been incorporated into the site allowed and permitted VOC emission rate increases.

The Company previously attempted lower VOC emissions with lower emitting mold release (a.k.a. co-solvent wax). However, these materials do not allow a clean release of the newly formed foam part and frequently cause the foam to stick to the mold, causing damage upon extraction. The partial deployment of the co-solvent appears to have complicated and artificially lowered baseline emissions in the October, 2010 NSR permit increase request. Appendix A contains the Tennessee Construction Application Forms for this request.

Permit History

The facility was originally constructed in 1989 by Johnson Controls with 2 foam seating lines and two smaller headrest foam lines installed between 1990 and 1991. The headrest lines were

sent to other facilities in the time frame of 1998 and 1999. In 2002, the building underwent an expansion to accommodate space for a third foam seating line, permitted and installed in 2004. The 2002 building expansion included expanded manufacturing area, expanded warehousing and the construction of a new main office area, allowing the old office area to be occupied by the expanding manufacturing space.

In 2009, the building was expanded again to accommodate tool storage. Adient assumed operation of the plant in May, 2016. In 2020, the maintenance shop, and tooling shop areas were added and the tank farm was reconfigured to include space previously housing the maintenance shop. In 2020, foam seating line 2 was replaced in a like-for-like replacement with no production increases.

The historical permits indicate the three lines in their current configuration date back to November, 2004, and permit #556316. This permit for the current configuration was issued with a VOC limit of 248.0 tons. The Company has prepared a calculation of the line potential emissions at full scale rates and uninterrupted scheduling with projected/calculated annual emissions of 491.7 tons or nearly twice the original 2004 permit levels. In an undocumented 2006 request, the permit level was raised to 258 tons and then again in October of 2010 to 285.9 tons. In 2016, the VOC limit was increased to 308 tons. Table 1 includes a summary of the relevant permit dates and actions as it pertains to VOC allowed emissions.

It is unclear why the request for an increase in 2004 did not consider or accommodate the full potential emissions in a “one-time-doubling” of the site emissions rate, but rather accepted an insignificant (less than 40 ton) VOC increase. It is important to note the lines have not been physically modified and no change in the method of operation has occurred in the timeframe from 2004 to present day. The current rates reflect emissions that are less than the line capability.

The Company seeks to revisit the permitting history with a retroactive overlay of the one-time-doubling at the 2004 VOC rates. Such a consideration encompasses the “minor increases” into a single and non-PSD increase. In so doing, the Company asserts this will correct the allowed emissions rates at the potential VOC emissions from the process. Given the uncertain nature of the increases since 2004, the Company seeks concurrence on this approach from the Tennessee Air Pollution Control Division and a review by U.S. EPA Region IV. It is important to the Company that the requested action be evaluated for proper PSD applicability so its actions are not deemed as an improper application of the PSD regulations or a sham request.

Table 1
Permit History and Summary
Adient Pulaski, TN

Date	VOC's Allowed (tons)	Description/Discussion
Nov. 2004	248.0	Original 3-line configuration
2006	258.0	Undocumented increase of 10 tons
Oct. 2010	285.9	Insignificant increase during Title V renewal
Jan. 2016	308.0	Insignificant increase during Title V renewal
Requesting	491.7	Seeking the Permit reflect the line potential emissions rate

Potential Emissions

Projected/potential emissions for the foam operation have been tabulated based on the maximum production capabilities of the three lines, operating continuously for 8,760 hours per year. Based on the maximum output and raw material consumption, the following assumptions were used to determine the process emissions potentials:

Maximum cushion production:	15,283,600 pads per year
Maximum wax usage rates:	1,036,760 pounds per year
VOC content of wax:	94.86 % by weight
VOC emissions potential:	983,470 pounds per year
	491.7 tons per year

Best Available Control Evaluation

The Tennessee Air Pollution Control Division inquired regarding the feasibility of providing VOC abatement for the existing foam operation. The Company evaluated VOC retrofit options for the lines using a Best Available Control Technology BACT model, considering technical and cost feasibilities.

For this operation, mold release wax is sprayed on open molds prior to receiving the foam components. The mold spray application occurs at manual and automated spray stations equipped with local exhaust collection hoods, strategically placed on the respective foam lines equipped with dry filtration for wax capture. The existing ventilation systems are estimated to have a VOC capture efficiency of approximately 80%, since the hoods are open to the general plant and not isolated or totally enclosed. The following data was used to estimate the cost benefit for retrofitted VOC control equipment:

Total System Exhaust:	269,450 SCFM
Projected VOCs:	491.7 tons per year
Capture Efficiency:	80%
Destruction Efficiency:	90%
Overall Projected Controls:	72%
Most Feasible Retrofit:	Regenerative Thermal Oxidizer
Total Capital Investment:	\$10.25 MM
Total Annual Costs:	\$4.37 MM (Vatavuk Cost Index)
Cost per Ton of Treatment:	\$12,351 per ton of VOC abated

Given the high exhaust rate, the relatively low VOC concentration in the exhaust and the cost to purchase and retrofit the facility with control equipment, the Company concludes that treatment of the mold release spray exhaust is not economically feasible. Further, the wax solids can create reliability issues for conventional air pollution control making technical feasibility questionable.

VOC abatement units that rely on elevated temperatures for VOC destruction also consume high quantities of fuel, in this case, natural gas is the projected fuel of choice. It is estimated that treatment to 90% control efficiency would consume approximately 431 standard cubic feet of natural gas per minute, or the equivalent of 226.5 million cubic feet of natural gas per year. The details of the cost feasibility analysis are included in Appendix B. This demonstration is presented in good faith to demonstrate the Company is not attempting to avoid the cost of VOC controls.

Continued Emission Reduction Efforts

The Company has a long history of investigating and attempting to deploy lower emitting alternatives. The solvent-based wax solutions must be compatible with the foam chemistry to provide release of the newly formed part, without causing damage or contaminating the foam cushion. Additionally, the mold release agents must be commercially available in full production quantities to be viable to the operation.

As discussed, attempts to bring co-solvent (low VOC release agents) have not been successful. The configuration of the cushion, the specific application for the original equipment manufacturer (the automotive companies), and the constant changing of molds to be utilized make automation of the spray application process difficult. Nonetheless, Adient strives to reduce its consumption rate of mold release agents through material conservation and innovation developments to increase wax yield while also reducing VOC emissions.