D R A F T

Presumptive MACT for Acetal Resins Production

Presumptive MACT Determination Document
Guidance Document - not a Rule

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Section 1. Introduction

1.1 P-MACT Definition

In 1994, EPA had to postpone work on several of the MACT standards due in November 1997 and November 2000 (the 7-year and 10-year MACT standards) as a result of resource constraints. If the EPA fails to set MACT standards on time, Section 112(j) of the Clean Air Act (Act) requires the States to establish emission limitations using a case-by-case determination of what the Federal standard would have been. Case-by-case MACT determinations under 112(j) will require substantial information and resources from State and local agencies, industry, and environmental groups, and there appears to be a strong incentive for all parties involved to gather information for 112(j) determinations and to promulgate standards on time. The amount of work needed to complete all of the 7-year and 10-year standards on time is difficult to predict; however, the EPA believes that new approaches are needed to reduce the amount of work and time associated with standards development. To achieve this goal, the EPA has initiated a new standard setting process called MACT Partnerships, that involves a partnership with States, industry, and environmental organizations. This process is described in the March 29, 1995 Federal Register.

The MACT Partnerships program involves two phases. The first phase involves the development of a "presumptive MACT." A presumptive MACT is not an emission standard; it serves as a statement of current knowledge of maximum achievable control technologies and a basis for a decision on how to develop the emission standard for the source category involved. The second phase is the formal standard development process.

1.2 Statutory Requirements

Section 112(e) of the CAA requires the promulgation of emissions standards (MACT standards) by a statutory deadline for listed source categories of the 189 HAPs identified in 112(b). If no MACT standard is promulgated within 18 months of the statutory deadline, Section 112(j)(2) of the CAA requires major sources to apply for a permit and comply with emission limitations equivalent to MACT. Section 112(g) of the CAA requires compliance with MACT on a case-by-case basis for constructions, reconstructions and major source modifications when no MACT standard has been promulgated by EPA. It is important to emphasize that "major source" means any stationary source or group of stationary sources located within a contiguous area under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year of any HAP or 25 tons per year of any combination of HAP.

The source category being addressed by this P-MACT document is acetal resins. The acetal resins source category is being addressed as part of a broader project (Polymers and Resins III) to develop a MACT standard for all facilities that produce formaldehyde based resins. This project includes the amino and phenolic resins source categories. The amino and phenolic resins source categories are addressed by a separate P-MACT document. The EPA is required to

develop a MACT standard for all of these source categories before November 15, 1997.

1.3 Industry Profile

There are over 3 facilities that produce acetal resins in the United States. These facilities are as follows:

Table 1. Acetal Resin Producers

Company	Location
Dupont	Parkersburg, WV
Hoechst Celanese	Bishop, TX
Ultraform	Theodore, AL

Dupont produces what is known as an acetal homopolymer. Hoechst Celanese and Ultraform produce an acetal copolymer. An acetal homopolymer is formed by reacting anhydrous formaldehyde to form a polymer. Acetal copolymers are formed by the polymerization of trioxane, which is formed by the trimerization of formaldehyde, with a copolymer, which is typically a cyclic ether such as ethylene oxide.

1.4 Roundtable Team Members

The following tables summarize the people and organizations who participated in the acetal resins P-MACT. All of these people provided comments on draft documents, participated in roundtable discussions or otherwise provided expertise and insight into the production of acetal resins. They will be invited to continue their participation throughout rule development.

Table 2. Roundtable Team Members

Organization Type	Organization	Name	Phone	Fax
Stappa/Alapco	Alabama Division of Environmental Management	Larry Brown Will Bacon	334-271-7861 334-271-7861	279-3044 279-3044
Industry	Dupont Hoechst Celanese Ultraform	John Dege Walt Stewart Gene Thomas Rita Beyers Wolfgang Heim	302-773-0900 304-863-4271 512-584-6334 512-584-6334 334-443-1603	4862 1361 6168 4554 1613
EPA	Office of Air Quality Planning and Standards	John Schaefer (lead engineer) Bob Rosensteel (senior engineer) Susan Wyatt (group leader) Larry Sorrels (economist) Jan King (economist)	919-541-0296 919-541-5608 919-541-3470 919-541-5041 919-541-5665	3470 3470 3470 0893 0893

Section 2. MACT Floor Determination

2.1 Storage Tanks

Analysis

Data on tank sizes, contents, and controls for storage tanks were provided by all three facilities. Most of the storage tanks have controls for air emissions, regardless of size and content.

Floor Determination

The floor level for applicability was determined by averaging the vapor pressure for controlled tanks. The control level was determined by selecting the median level of control on storage tanks. The determination was made that control is required for most tanks of all sizes at the 95% control level. The reference technologies used are very similar to those in the HON. The main difference is in the reported vapor pressure cutoffs. The cutoffs used for acetal resins are much higher due to the lower volatility of chemicals being stored. The applicability cutoffs are as follows in table 3:

Table 3. Storage Tank Applicability Cutoffs

Tank Category	Tank Size	Vapor Pressure
Large	> 40,000 gallons	> 7.11 psi
Medium	20,000 to 40,000 gallons	> 5.92 psi
Small	< 20,000 gallons	> 4.45 psi

Open Issues

None

2.2 Process Vents

Analysis

There is a great deal of variation among the processes and process vents at each facility. These differences are enough that each facility's group of process vents needs to be treated as a separate class or type in the floor determination and in selecting an emission limit. The following describes the process type classification for each facility agreed to in the presumptive MACT discussions.

Table 4. Process Vent Classes

Facility	Process Vent Class
Dupont	acetal homopolymer production
Hoechst Celanese	acetal copolymer with chemical finishing
Ultraform	acetal copolymer with thermal finishing

Most process vents are controlled by scrubbers. Describing the floor in terms of the average Total Resource Effectiveness (TRE) values based on the HON TRE has little meaning because the TRE values are so high (20-50+). In the HON no control is required at a TRE value equal to or greater than 1. It was decided that the floor would be better expressed in the form of a total reduction of HAP or a concentration limitation.

Floor determination

The floor needs to be determined separately for each process type or class at the three facilities as described in table 4.

Open Issues

(1) The floors for the 3 process types at each of the three facilities need to be determined.

(2) Emissions levels of formaldehyde cannot currently be accurately determined, since this measurement is difficult due to the chemistry of formaldehyde. The formaldehyde in the vent stream reacts with an acid in the current reference test method, thus overestimating the actual emissions according to plant operators.

2.3 Wastewater

Analysis

All facilities have wastewater controls in place.

Floor Determination

The floor control level is the HON.

Open Issues

None

2.4 Equipment Leaks

Analysis

Hoechst Celanese and Ultraform operate LDAR programs in accordance with the subpart VV New Source Performance Standards (NSPS). Dupont operates an LDAR program in accordance with the HON reg-neg.

Floor Determination

The NSPS LDAR requirement defines the floor (40 CFR 60 Subpart VV) based on the information collected.

Open Issues

None

Section 3. Presumptive MACT

3.1 Storage Tanks

Analysis

Most storage tanks at all three facilities have controls in place that are consistent with the requirements of the HON. The floor applicability cutoffs for control are different from the HON based on the volatility of the chemicals stored. Options beyond the floor level of control that were examined include subpart Kb (plus small storage tanks), and the HON (plus small storage tanks).

Presumptive MACT determination

For tanks smaller than 20,000 gallons, the HON control requirement (95 percent) and the floor applicability level (4.5 psi) will apply. For tanks 20,000 gallons and greater, the HON control requirements (95 percent) and the HON applicability levels will apply, with one caveat. For the tanks which would not have to be controlled based on the floor, EPA will assess whether the molecular weight of the actual chemicals being stored should be an additional factor included in the cutoff decision. Decisions requiring controls more stringent than the floor will be based on cost-effectiveness judged to be reasonable for other similar rules which have been promulgated (about $3,500/Mg).

Open Issues

Calculations to consider molecular weights, as described above, have yet to be done.

3.2 Process Vents

Analysis

As described in the floor discussion, the production processes at each facility are considerably different and have very different emission profiles. Each facility's group of process vents constitutes a separate class or type of process vent and as such will require a separate floor determination. An overall concentration limitation or total reduction of HAP appear to be the most feasible approaches for regulating emissions. The use of incineration was looked at as a control option beyond the floor. Incineration would have been very cost ineffective due to the low concentration of organic compounds emitted from the process vents. Therefore, it was rejected as a control option.

Presumptive MACT determination

Emission limits based on the floor level of control should be determined for each facility using a concentration or overall emission reduction for each facilities’s process vents.

Open Issues

Determination of the emission limits representing P-MACT for the three types of processes at the three facilities has yet to be done. This needs to be done in conjunction with the appropriate State regulating authorities.

3.3 Wastewater

Analysis

All three facilities currently have controls for air emissions from wastewater consistent with the HON and the HON applicability cutoffs. Using HON control requirements for all wastewater streams was looked at as an option above the floor.

Presumptive MACT determination

Use HON wastewater applicability and flow requirements. The applicability for wastewater streams is as follows:

- 1000 ppm HAP concentration
- 10 liters per minute flow rate
- VOHAPs identified in Table 9 of Subpart G

Open Issues

None.

3.4 Equipment Leaks

Analysis

The floor requires a LDAR program that meets the requirements of the subpart VV NSPS. The HON was looked at a possible option above the floor, but was rejected.

Presumptive MACT determination

The LDAR should be consistent with NSPS LDAR requirements (40 CFR 60 subpart VV). The HON would be acceptable as an alternative approach.

Open Issues

None.

3.5 Reporting, Recordkeeping and Monitoring

Reporting Requirements

Semi-annual compliance reports will be required in either hard copy or electronic formats. The focus of all reporting requirements will be on certifying compliance with minimal data requirements.

Recordkeeping Requirements

HON requirements will be used. Facilities will be required to keep records of key parameters for five years in hard copy or electronic format. Records for the first two years must be kept on-site in and easily accessible.

Monitoring Requirements

HON monitoring requirements will be used. The primary monitoring requirements will be for key control device parameters. The operating limits for these control devices will be determined by the owner/operator. The averaging period will use data requirements similar to the HON.

Open Issue

A reliable and acceptable method to determine initial compliance with emission limitation requirements for process vents needs to be identified. (EPA and industry lead)

3.6 Floor and Presumptive MACT Summary

Table 5. Floor Summary

Emission Point	Applicability	Control Requirement
Storage Tanks	• > 40,000 gallons & vapor pressure > 7.1 psi • 20,000 to 40,000 gallons & vapor pressure >5.9 psi • < 20,000 gallons & vapor pressure > 4.5 psi	HON - 95% HON - 95% HON - 95%
Process Vents	• homopolymer • copolymer - thermal finishing • copolymer - chemical finishing	To be determined for the group of vents at each facility, each of which constitutes a separate type; (will use a concentration limitation or emission reduction format)
Wastewater	HON	HON
Equipment Leaks	dependant on type of equipment and volatility	monthly LDAR per 40 CFR 60 subpart VV

Table 6. Presumptive MACT Summary

Emission Point	Applicability	Control Requirement
Storage Tanks	• ≥20,000 gallons-Vapor pressures from HON, with additional consideration of actual molecular weight • <20,000 gallons - vapor pressure >4.5 psi	HON - 95%
Process Vents	• homopolymer • copolymer - thermal finishing • copolymer - chemical finishing	Same as floor
Wastewater	HON	HON
Equipment Leaks	dependant on type of equipment and volatility	monthly LDAR per 40 CFR 60 subpart VV with HON as an option

Section 4. Implementation Issues

4.1 Summary of Open Issues

The following items are issues that have not been resolved during the presumptive MACT process.

- Due to great variability among each producer's process and process vent characteristics, the grouping of process vents at each of the three facilities need to be treated as a separate class or type. The appropriate emission limit based on the floor level of control needs to be determined by EPA. (EPA lead)

- Actual baseline emissions for equipment leaks in the source category need to be verified. (EPA and Industry)

- Outlet concentration is difficult to determine due to problems with the reference test (dnph) and the chemistry of acetal resins. (EPA & industry lead)

- A reliable test method for determining outlet vent concentration should be found for determining initial compliance with emissions requirements for process vents. (EPA lead)

- Molecular weight as a factor for selected storage tank applicability cutoffs needs to be examined. (EPA lead)