MARYLAND DEPARTMENT OF THE ENVIRONMENT

AIR AND RADIATION ADMINISTRATION
APPLICATION FOR A PERMIT TO CONSTRUCT

DOCKET #11-25

COMPANY: Composites & Metal Products USA, Inc.

LOCATION: One Peninsula Drive, North East, MD 21901

APPLICATION: Installation of two (2) new fiberglass chopping lines.

ITEM	DESCRIPTION
1	Notice of Application and Opportunity to Request an Informational Meeting
2	Permit to Construct Application – Forms 5, 5T, 5EP, Site Maps, Emissions Calculations, Vendor Specifications, Toxic Air Pollutant Compliance Demonstration, and Safety Data Sheets
3	MDE EJ Screening Report
4	Supplemental Information – Emissions Factor Documentation
4	Evidence of Zoning Approval

DEPARTMENT OF THE ENVIRONMENT
AIR AND RADIATION ADMINISTRATION

NOTICE OF APPLICATION AND
OPPORTUNITY TO REQUEST AN INFORMATIONAL MEETING

The Maryland Department of the Environment, Air and Radiation Administration (ARA) received a permit-to-construct application from Composites & Metal Products USA, Inc. on July 24, 2025 for the installation of two (2) new fiberglass chopping lines. The proposed installations will be located at One Peninsula Drive, North East, MD 21901.

In accordance with HB 1200/Ch. 588 of 2022, the applicant provided an environmental justice (EJ) Score for the census tract in which the project is located. The EJ Score, expressed as a statewide percentile, was shown to be 69 which the Department has verified. This score represents a combined measure of pollution and the potential vulnerability of a population to the effects of pollution.

Copies of the application, the MDE EJ Screening Tool Report (which includes the score), and other supporting documents are available for public inspection on the Department's website at https://mde.maryland.gov/programs/Permits/AirManagementPermits/Pages/index.aspx (click on Docket Number 11-25). Any applicant-provided information regarding a description of the indicators contributing to that EJ score can also be found at the listed website. Such information has not yet been reviewed by the Department. A review of the submitted information will be conducted when the Department undertakes its technical review of all documents included in the application.

Pursuant to the Environment Article, Section 1-603, Annotated Code of Maryland, the Department will hold an informational meeting to discuss the application and the permit review process if the Department receives a written request for a meeting within 10 working days from the date of the second publication of this notice. A requested informational meeting will be held virtually using teleconference or internet-based conferencing technology unless a specific request for an in-person informational meeting is received. All requests for an informational meeting should be directed to the attention of Ms. Shannon Heafey, Air Quality Permits Program by email to shannon.heafey@maryland.gov or by mail to the Air and Radiation Administration, 1800 Washington Boulevard, Baltimore, Maryland 21230.

Further information may be obtained by calling Ms. Shannon Heafey at 410-537-4433.

Christopher R. Hoagland, Director
Air and Radiation Administration

Composites USA

One Peninsula Drive
North East, MD 21901
P. 410-287-2700
F. 410-287-5222
www.compositesusa.com

July 23, 2025

By Email
Ms. Janay Mendez
Regulatory & Compliance Engineer
Air & Radiation Management Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230

Subject: Permit-to-Construct Application to add Two New Chopping Stations

Dear Ms. Mendez:

As we have discussed, Composite & Metal Products USA, Inc. (Composites USA) is providing a Maryland Department of the Environment Air & Radiation Administration (MDE) Permit-to-Construct (PTC) application to add two chopping lines to its facility located at One Peninsula Drive, North East, MD 21901. More specifically, we are proposing to add two (2) Magnum Venus Plastech (MVP) High Volume Low Pressure (HVLP) Fiberglass Chopping Stations each equipped with one (1) chopping gun and associated equipment for application of resin and fiberglass to our existing facility permitted under MDE Permit-to-Operate No. 015-0134. The following are provided as a part of the PTC application:

· MDE Forms 5, 5EP and 5T
· Emission Calculations and Emission Factor References
· Toxic Air Pollutant (TAPs) Analysis and Associated SCREEN3 Modeling Output
· A Site Plan
· MVP Chopper/Wet-Out System Information
· Safety Data Sheets (SDS)

At this time, we would also like to request that MDE make changes to the following ARA registration descriptions found in the table of registered installations on page 2 of 12 of the current PTO (Permit No. 015-0134).

6-0121 – Two (2) Single Station Chop Hoop Filament Winders (rather than "Dual")

6-0122 – Seven (7) Helical Filament Winding Stations (40 MVP) One (1) Helical Pipe Winder servicing Six (6) Pipe Winding Stations (Previously there were 7 winding stations)

6-0123 – Open-Mold Hand Layup Operations (OK as is)

6-0124 – Closed Mold Fabricating Operations (Remove entire registration – does not exist)

6-0125 – Grinding and Finishing Operations (OK as is)

Composites USA would also like to request that MDE impose a permit condition on the facility that limits the facility-wide hazardous air pollutant (HAP) emissions to 10 tons per year of any HAP and 25 tons per year of cumulative HAP to solidify minor source status with respect to Clean Air Act Section 112 (Maximum Achievable Control Technology standards).

We very much appreciate your time and review of the PTC application and the requests within this letter. Please let us know if you have any questions or would like to discuss via a Teams or Zoom meeting. I can be reached at dnaugle@compositesusa.com; or 410-656-2785 or you may contact Ms. Tiffany L Dillow, REM at tiffany.dillow@powereng.com; cell 410-733-5862 or Mr. Jeff Doyon of BIOME SC at jfdoyon@biomesc.com; cell (418) 928-6339 both who helped us with this submittal.

Sincerely,

Daniel Naugle
General Manager
Composites USA
(O) 410-656-2785, (C) 302-358-0094

Attachments

c: Suna Sariscak, MDE ARA

Jean-François (Jeff) Doyon, BIOME SC

Tiffany L Dillow, REM, POWER Engineers, Inc., a Member of WSP

Attachment A – MDE Forms

Form 5
Form 5T
Form 5 EP

AIR QUALITY PERMIT TO CONSTRUCT APPLICATION CHECKLIST

OWNER OF EQUIPMENT/PROCESS	
COMPANY NAME:	Composite & Metal Products USA, Inc.
COMPANY ADDRESS:	One Peninsula Drive, North East, MD 21901
LOCATION OF EQUIPMENT/PROCESS	
PREMISES NAME:	Composite & Metal Products USA, Inc.
PREMISES ADDRESS:	One Peninsula Drive, North East, MD 21901
CONTACT INFORMATION FOR THIS PERMIT APPLICATION	
CONTACT NAME:	Daniel Naugle
JOB TITLE:	General Manager
PHONE NUMBER:	410-656-2785
EMAIL ADDRESS:	dnaugle@compositesusa.com
DESCRIPTION OF EQUIPMENT OR PROCESS	
Addition of two (2) chopping stations each consisting of one (1) chopping gun and associated equipment for applica	

Application is hereby made to the Department of the Environment for a Permit to Construct for the following equipment or process as required by the State of Maryland Air Quality Regulation, COMAR 26.11.02.09.

Check each item that you have submitted as part of your application package.

☒ Application package cover letter describing the proposed project

☒ Complete application forms (Note the number of forms included or NA if not applicable.)

No. 1 Form 5
No. 1 Form 5T
No. 1 Form 5EP
No. _____ Form 6
No. _____ Form 10
No. _____ Form 11
No. _____ Form 41
No. _____ Form 42
No. _____ Form 44

☒ Vendor/manufacturer specifications/guarantees

☒ Evidence of Workman's Compensation Insurance

☒ Process flow diagrams with emission points

☒ Site plan including the location of the proposed source and property boundary

☒ Material balance data and all emissions calculations

☒ Material Safety Data Sheets (MSDS) or equivalent information for materials processed and manufactured.

☐ Certificate of Public Convenience and Necessity (CPCN) waiver documentation from the Public Service Commission (1)

☐ Documentation that the proposed installation complies with local zoning and land use requirements (2)

(1) Required for emergency and non-emergency generators installed on or after October 1, 2001 and rated at 2001 kW or more.

(2) Required for applications subject to Expanded Public Participation Requirements.

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1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪ 1-800-633-6101 ▪ www.mde.state.md.us

APPLICATION FOR FUEL BURNING EQUIPMENT

Information Regarding Public Outreach

For Air Quality Permit to Construct applications subject to public review, applicants should consider the following information in the initial stages of preparing a permit application.

If you are not sure at the time you are applying for a permit whether public review of your application is required or for information on steps you can take to engage the surrounding community where your planned project will be located, please contact the Air Quality Permits Program at 410-537-3225 and seek their advice.

Communicating and engaging the local community as early as possible in your planning and development process is an important aspect of your project and should be considered a priority. Environmental Justice or "EJ" is a movement to inform, involve, and engage communities impacted by potential and planned environmental projects by affording citizens opportunities to learn about projects and discuss any concerns regarding impacts.

Although some permit applications are subject to a formal public review process prescribed by statute, the Department strongly encourages you to engage neighboring communities separate from and well ahead of the formal permitting process. Sharing your plans by way of community meetings, informational outreach at local gatherings or through local faith-based organizations can initiate a rewarding and productive dialogue that will reduce anxiety and establish a permanent link with your neighbors in the community.

All parties benefit when there is good communication. The Department can assist applicants in developing an outreach plan that fits the needs of both the company and the public.

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APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☐ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name
Composite & Metal Products USA, Inc.

Mailing Address
One Peninsula Drive
Street Address

North East | MD | 21901
City | State | Zip

Telephone Number
(410) 656-2785

Signature

Daniel Naugle, General Manager
Print Name and Title | Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | **Premises No.** (3-6)
Registration Class (7) | **Equipment No.** (8-11)
Data Year (12-13) | **Application Date**

1B. Equipment Location and Telephone Number (if different from above)
Same as above
Street Number and Street Name

City/Town | State | Zip | ( ) Telephone Number

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status	New Construction Begun (MM/YY)	New Construction Completed (MM/YY)	Existing Initial Operation (MM/YY)
B	1125	0126	1996
15	16-19	20-23	20-23

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
Two (2) Magnum Venus Plastech (MVP) High Volume Low Pressure (HVLP) Fiberglass Chopping Stations

5. Workmen's Compensation Coverage XWS59551297 (Binder/Policy Number) 5/5/26 (Expiration Date)
Company Liberty Mutual Ins. Co.
NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 2 chopping stations

6B. Number of Stack/Emission Points Associated with this Equipment 1

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name N/A Title N/A

Company N/A

Mailing Address/Street N/A

City/Town N/A State N/A Telephone (N/A)

8. Major Activity, Product or Service of Company at this Location

Reinforced fiberglass products manufacturing.

9. Control Devices Associated with this Equipment

None ☑ 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
☐	☐	☐	☐	☐	☐	☐	☐
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

☐ Describe _____ 24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
N / A	N/A	N/A	N / A	N / A	N/A
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
N / A	N / A	N / A	N / A	N / A
46-52	53-55	56-58	59-63	64-65

OTHER FUELS Electric (Specify Type) ☐ 66-1 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) ☐ 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
☐	☐			0 8	5	2 6 0
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
☑					
76	77-78	79-80	81-82	83-84	

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) N (85)

If not, then	Height Avove Ground (FT)	Inside Diameter at Top (IN)	Exit Temperature (°F)	Exit Velocity (FT/SEC)
	40	36	AMB.	47
	86-88	89-91	92-95	96-98

NOTE: See attached

Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? N (Y or N)

	NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.	Polyester Resin	N/A	200	lbs	400,000	lbs
2.	Vinyl Ester Resin	N/A	10	lbs	20,000	lbs
3.	Furfural Alcohol Resin	98-00-0	1	lbs	1,000	lbs
4.	Fiberglass Reinforcement	N/A	80	lbs	167,000	lbs
5.	Acetone Solvent	67-64-1	8	lbs	16,000	lbs
6.	Phenolic Resin	9003-35-4	120	lbs	240,000	lbs
7.						
8.						
9.						
TOTAL						

14. Output Materials (for this equipment)
Process/Product Stream

	NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.	Fiberglass Reinforced Products	N/A	290	lbs	587,000	lbs
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
TOTAL						

15. Waste Streams- Solid and Liquid

	NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.	Cutoffs	N/A	Varies	N/A	Varies	N/A
2.	Cutouts	N/A	Varies	N/A	Varies	N/A
3.						
4.						
5.						
6.						
7.						
8.						
9.						
TOTAL						

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
N / A	N / A	N / A
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
N / A	3 0 5 . 1	N / A
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
N / A	N / A	N / A
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
N / A	N / A	N / A
150-154	155-159	160-164

Method Used to Determine Emissions **(1= Estimate 2= Emission Factor 3= Stack Test 4= Other)**

TSP	SOX	NOX	CO	VOC	PM10
				2	
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. **Annual Operating Rate** (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

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FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

Applicant Name: Composite & Metal Products USA, Inc.

Step 1: Quantify premises-wide emissions of Toxic Air Pollutants (TAP) from new and existing installations in accordance with COMAR 26.11.15.04. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Class I or Class II?	Screening Levels (µg/m³)			Estimated Premises Wide Emissions of TAP			
						Actual Total Existing TAP Emissions	Projected TAP Emissions from Proposed Installation	Premises Wide Total TAP Emissions	
			1-hour	8-hour	Annual	(lb/hr)	(lb/hr)	(lb/hr)	(lb/yr)
ex. ethanol	*64175*	*II*	*18843*	*3769*	*N/A*	*0.60*	*0.15*	*0.75*	*1500*
ex. benzene	*71432*	*I*	*80*	*16*	*0.13*	*0.5*	*0.75*	*1.00*	*400*
Styrene	100425	II	1704.05	852.02	N/A	2.11*	32.775	32.775	18,506
Phenol	108952	II	N/A	192.45	N/A	1.41	2.50	2.50	2,821
Formaldehyde	50000	II	N/A	20.30	0.8	0.14	0.25	0.25	282
Vinyl Toluene	250113154	II	4833.54	2416.77	N/A	0.70	2.50	2.50	1,410
Furfuryl Alcohol	98000	II	601.84	401.23	N/A	0.036	0.036	0.036	1.82
Furaldehyde	98011	II	N/A	78.59	N/A	0.084	0.084	0.084	4.21

* Actual Existing Styene emissions from 2024 ECR.

Note: Screening levels can be obtained from the Department's website (http://www.mde.maryland.gov) or by calling the Department.
Step 2: Determine which TAPs are exempt from further review. A TAP that meets either of the following Class I or Class II small quantity emitter exemptions is exempt from further TAP compliance demonstration requirements under Step 3 and Step 4.

Class II TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(a))
A Class II TAP is exempt from Step 3 and Step 4 if the Class II TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour, and any applicable 1-hour or 8-hour screening level for the TAP must be greater than 200 µg/m³.

Class I TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(b))
A Class I TAP is exempt from Step 3 and Step 4 if the Class I TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour and 350 pounds per year, any applicable 1-hour or 8-hour screening level for the TAP must be greater than 200 µg/m³, and any applicable annual screening level for the TAP must be greater than 1 µg/m³.

If a TAP meets either the Class I or Class II TAP Small Quantity Emitter Exemption Requirements, no further review under Step 3 and Step 4 are required for that specific TAP.

FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

Step 3: Best Available Control Technology for Toxics Requirement (T-BACT, COMAR 26.11.15.05)
In the following table, list all TAP emission reduction options considered when determining T-BACT for the proposed installation. The options should be listed in order beginning with the most effective control strategy to the least effective strategy. Attach supporting documentation as necessary.

Target Pollutants	Emission Control Option	% Emission Reduction	Costs		T-BACT Option Selected? (yes/no)
			Capital	Annual Operating	
ex. ethanol and benzene	*Thermal Oxidizer*	*99*	*$50,000*	*$100,000*	*no*
ex. ethanol and benzene	*Low VOC materials*	*80*	*0*	*$100.000*	*yes*
Styrene, Phenol, Formaldehyde	Non-atomized Spray System	57	0	0	yes
Vinyl Toluene	Non-atomized Hand Application	60	0	0	yes
Furfuryl Alcohol / Furaldehyde	Non-atomized Hand Application	60	0	0	yes

(attach additional sheets as necessary)

Step 4: Demonstrating Compliance with the Ambient Impact Requirement (COMAR 26.11.15.06)
Each TAP not exempt in Step 2 must be individually evaluated to determine that the emissions of the TAP will not adversely impact public health. The evaluation consists of a series of increasingly non-conservative (and increasingly rigorous) tests. Once a TAP passes a test in the evaluation, no further analysis is required for that TAP. "Demonstrating Compliance with the Ambient Impact Requirement under the Toxic Air Pollutant (TAP) Regulations (COMAR 26.11.15.06)" provides guidance on conducting the evaluation. Summarize your results in the following table. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Screening Levels ($\mu g/m^3$)			Premises Wide Total TAP Emissions		Allowable Emissions Rate (AER) per COMAR 26.11.16.02A		Off-site Concentrations per Screening Analysis ($\mu g/m^3$)			Compliance Method Used?
		1-hour	8-hour	Annual	(lb/hr)	(lb/yr)	(lb/hr)	(lb/yr)	1-hour	8-hour	Annual	AER or Screen
ex. ethanol	*64175*	*18843*	*3769*	*N/A*	*0.75*	*1500*	*0.89*	*N/A*	*N/A*	*N/A*	*N/A*	*AER*
ex. benzene	*71432*	*80*	*16*	*0.13*	*1.00*	*400*	*0.04*	*36.52*	*1.5*	*1.05*	*0.12*	*Screen*
Styrene	100425	1704.05	852.02	N/A	32.775	18,506	6.10	3.05 (8-hr)	459.8	321.86	N/A	Screen
Phenol	108952	N/A	192.45	N/A	2.50	2,821	0.689 (8-hr)	N/A	N/A	24.55	N/A	Screen
Formaldehyde	50000	N/A	20.30	0.8	0.25	282	0.073 (8-hr)	0.0029	N/A	2.42	0.276	Screen
Vinyl Toluene	250113154	4833.54	2416.77	N/A	2.49	1,410	17.3	8.65 (8-hr)	N/A	N/A	N/A	AER
Furfuryl Alcohol	98000	601.84	401.23	N/A	0.036	1.8	2.15	1.44 (8-hr)	N/A	N/A	N/A	AER
Furaldehyde	98011	N/A	78.59	N/A	0.084	4.2	0.0281 (8-hr)	N/A	N/A	N/A	N/A	AER

If compliance with the ambient impact requirement cannot be met using the allowable emissions rate method or the screening analysis method, refined dispersion modeling techniques may be required. Please consult with the Department's Air Quality Permit Program prior to conducting dispersion modeling methods to demonstrate compliance.

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FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Composite & Metal Products USA, Inc.

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
Stack

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
Exhaust stack for manufacturing facility building housing all equipment

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	I	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	8	Spring Percent	
Days per week:	5	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):	40	Length and width dimensions at top of rectangular stack (ft):	Length: N/A	Width: N/A
Height above structures (ft):	N/A			
Exit temperature (°F):	Amb.	Inside diameter at top of round stack (ft):		3
Exit velocity (ft/min):	2,820	Distance from emission point to nearest property line (ft):		63
Exhaust gas volumetric flow rate (acfm):	19,933	Building dimensions if emission point is located on building (ft)	Height N/A	Length N/A / Width N/A

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☒ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☐ Dust Suppression System No. _____
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☐ Carbon Adsorber No. _____
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

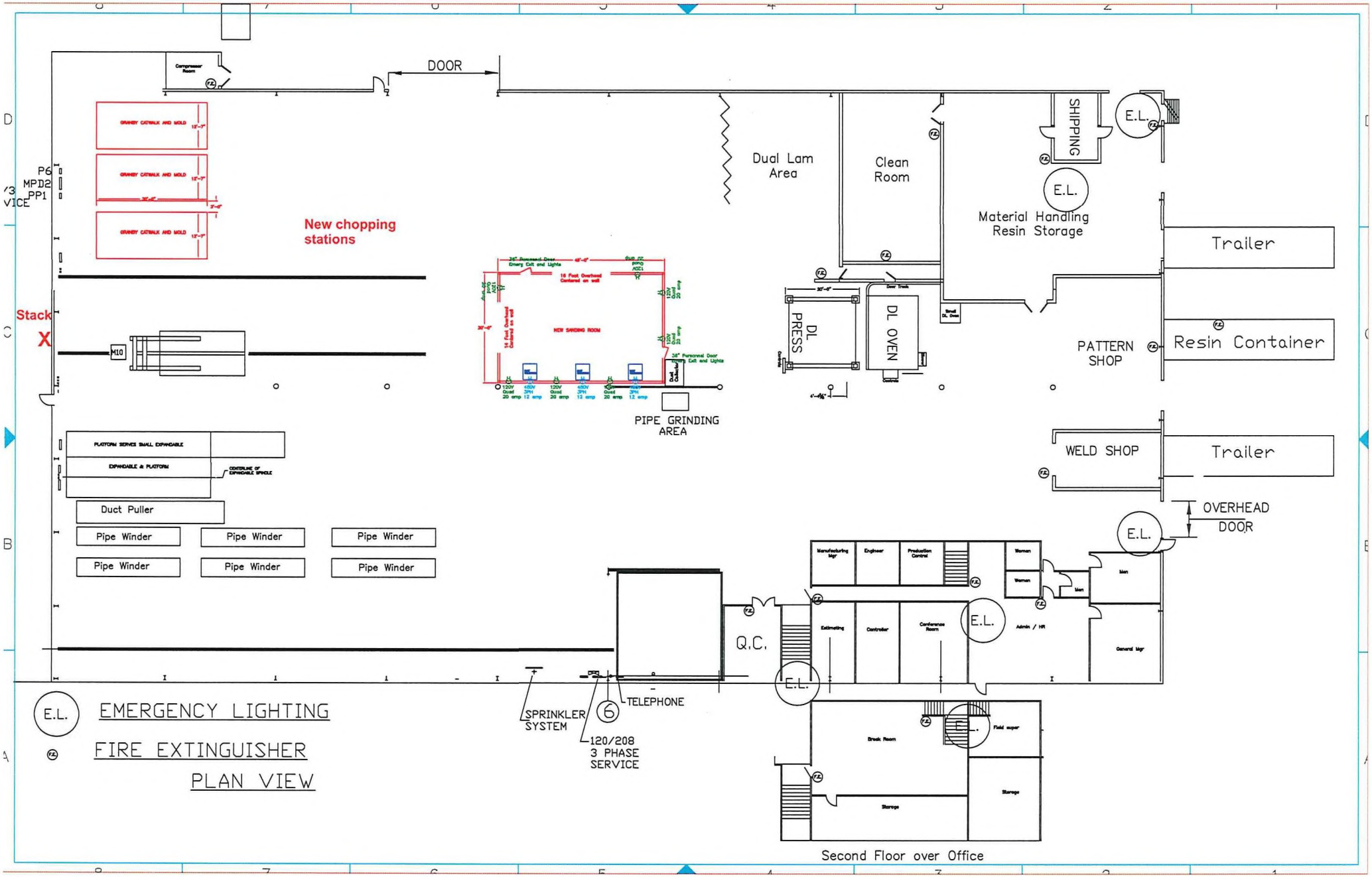
6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)		N/A	N/A	N/A
Particulate Matter (filterable as PM2.5)		N/A	N/A	N/A
Particulate Matter (condensables)		N/A	N/A	N/A
Volatile Organic Compounds (VOC)		38.14	305.14	11.51
Oxides of Sulfur (SOx)		N/A	N/A	N/A
Oxides of Nitrogen (NOx)		N/A	N/A	N/A
Carbon Monoxide (CO)		N/A	N/A	N/A
Lead (Pb)		N/A	N/A	N/A
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)		N/A	N/A	N/A
Methane (CH_4)		N/A	N/A	N/A
Nitrous Oxide (N_2O)		N/A	N/A	N/A
Hydrofluorocarbons (HFCs)		N/A	N/A	N/A
Perfluorocarbons (PFCs)		N/A	N/A	N/A
Sulfur Hexafluoride (SF6)		N/A	N/A	N/A
Total GHG (as CO_2e)		N/A	N/A	N/A
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Styrene		32.775	262.2	9.25
Phenol		2.50	20.0	1.41
Formaldehyde		0.25	2.0	0.141

(Attach additional sheets as necessary.)

Attachment B – Site Maps

Site Map - Composites USA, 1 Peninsula Drive, North East, MD


DOOR
Compressor Room
GRANDY CATWALK AND MOLD
New chopping stations
Stack
X
M10
Dual Lam Area
Clean Room
SHIPPING
E.L.
Material Handling Resin Storage
Trailer
DL PRESS
DL OVEN
PATTERN SHOP
Resin Container
NEW SANDING ROOM
PIPE GRINDING AREA
WELD SHOP
Trailer
OVERHEAD DOOR
Duct Puller
Pipe Winder
Pipe Winder
Pipe Winder
Pipe Winder
Pipe Winder
Pipe Winder
Q.C.
Manufacturing Mgr
Engineer
Production Control
Women
Women
Men
Men
Estimating
Controller
Conference Room
Admin / HR
General Mgr
Break Room
Field supvr
Storage
Storage
SPRINKLER SYSTEM
TELEPHONE
120/208 3 PHASE SERVICE
EMERGENCY LIGHTING
FIRE EXTINGUISHER
PLAN VIEW
Second Floor over Office

Attachment C – Emissions Calculations

Composites USA VOC Emissions Summary

	Emissions			
TAP	**(lb/day)**	**(lb/hr)**	**(lb/yr)**	**(Ton/yr)**
Styrene	262.2	32.78	18,505.8	9.25
Vinyl Toluene	20.0	2.50	1,409.8	0.70
Phenol	20.0	2.5	2,821.0	1.41
Formaldehyde	2.0	0.25	282.1	0.14
Furaldehyde	0.67	0.084	4.21	0.0021
Furfuryl alcohol	0.29	0.036	1.82	0.0009
	305.14	38.14	23,024.7	11.51

Emission profile for additionnal chop guns (2 guns)

Composites USA — PERMIT TO MODIFY TO INTEGRATE 2 CHOP GUNS

Resin usage: 402300 lbs compounded — 2025 — No gelcoat considered

Water tanks: 30 units/year — 4850 lbs of resin / unit
(3 sections) — 1 tank section per chop gun per shift = 1625 lbs / shift/gun

Fuel tanks: 30 units/year — 8560 lb of resin / unit
30000 gal cap type - 3 sections/unit — 1 tank section per chop gun per shift = 2850 lbs/shift / gun

Styrene max content: 40%
Vinyl toluene max content: 13.1%
Considering vinyl toluene vapor pressure is 25% of styrene vapor pressure, emission factors derived from ACMA is adjusted (like alpha-methylstyrene) with equivalent monomer content
25%
Assume resin usage is only polyester resin, we'll only consider FIT (Mechanical resin application non atomized)

Mechanical non-atomized: 100%

Operations on 5 days / week
250 days
One shift
2 chopper guns

Styrene emissions as calculated by ACMA UEF (unified emissions factors)
Vinyl toluene emissions as calculated by using vapor pressure ratio

Process

Mechanical non-atomized - low pressure

Resin usage (lbs)	Emission factors (lbs styrene/lbs)	Annual emissions (lbs)
402300	0.046	18505.8
	(lbs of vinyl toluene/lbs) 0.0035	1409.8

styrene usage 160920 /year
Vinyl toluene usage 52701 /year

Hand layup

Resin usage (lbs)	Emission factors (lbs styrene/lbs)	Annual emissions (lbs)
0	0.062	0

Total emissions 19916 lbs
10.0 tons US

Hourly emissions rate based on annual usage
9.25 lbs of styrene per hour
0.70 lbs of vinyl toluene per hour

Hourly emissions rate based on max daily resin usage - 2 fuel tanks in progress
1 gun 2850 pounds of resin/day
2 guns 5700 pounds of resin/day
Hourly emissions rate would then be for 2 guns
32.78 lbs of styrene/hour
2.50 lbs of vinyl toluene/hour

2.5 lbs of phenol/hour
0.25 lbs of formaldehyde/hour
0.084 lbs of furaldehyde/hour
0.036 lbs of furfuryl alcohol/hour
Total VOC per day 305.1 lbs VOC/day

Corresponding max emission (400,000 pounds of resin) 22196.7 lbs
Current permit limitations with equipment on site 11.10 tons

NOTE emission factors for reporting purposes is 0,15 pounds of styrene per pounds of styrene used as shown in ECR 2024
It should be changed by using the ACMA emission factors which are acknowledged by authorities in North America

Phenol and formaldehyde emissions

Max daily usage at any given time	**200**	pounds of phenolic resin (including component B - hardener) 1/2 drum

According to SDS the phenolic resin contains

10%	phenol max
1%	Formaldehyde

Considering max daily usage of	200	lbs

Max usage of phenol	20	lbs/day
Max usage of formaldehyde	2	lbs/day

Furaldehyde and furfuryl alcohol emissions

Max daily usage at any given time | 4 | pounds of Hetron resin

According to SDS the Hetron resin has the following CAS as volatils

16.8%	Furaldehyde	98-01-1
7.3%	Furfuryl alcohol	98-00-0

Considering max daily usage of | 4 | lbs

Max usage of furaldehyde	0.6728	lbs/day	(Emissions as well)
Max usage of furfuryl alcohol	0.2904	lbs/day	(Emissions as well)

Attachment D – Equipment Information

MVP
MAGNUM VENUS PRODUCTS

Patriot Chop/Wet-Out System

Unprecedented precision, power, versatility and rugged construction for long lasting use.

The Patriot Chop/Wetout system delivers unprecedented precision, power, versatility and rugged construction for long lasting use, rapid access design (RAD) for easy maintenance, and reliable performance. The Patriot Chop/Wetout system is designed with highly accurate Patriot technology and modular versatility to make quality parts with minimal overspray and greatly reduce material waste.

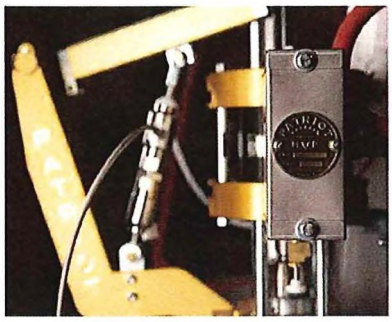
With a catalyst-to-resin variance ratio of 1% or less, the Patriot chop system greatly improves upon competitive systems with tested with variance ratios of 25% – 30%. The key to efficient FRP production is achieving a uniform laminate. Precise metering will correct many of the quality issues, such as porosity, inconsistent thickness.

The Patriot Chop/Wetout System features a deep induction heat hardened Fluid Section which is then coated with a thick hard chrome layer to increase the wear characteristics of the system, allowing it to run for longer periods.

Patriot is designed and built with modular components to create the optimum configuration for your needs. Utilizing quick-change components extends the system life and allows for reduced down time. The major components change out in 10 minutes or less. Both the Fluid Section and Catalyst Pump on Patriot feature the new "self-healing" seal that has the lowest coefficients of friction available today. This seal does not require packing adjustments, and greatly reduces the problems associated with heat buildup and wear.

MODELS

STANDARD VOLUME SYSTEM | HIGH VOLUME SYSTEM



HIGH VOLUME SYSTEM

Specifications:

- Output Capabilities: 7lb-30lbs/min (3.17-13kg/min)
- Catalyst Percentage: 0.8%-3.8% with PAT-CP 300
- Air Consumption: 43 CFM
- Maximum Air Input Pressure: 100 psi (7 bar)

Options:

- CFH-4000-B
- CFH-4000-AI (Air Initiate)
- CB-8000 Monitor
- CTS-9000 Catalyst Alarm

Attachment E – TAPS Analyses and SCREEN3 Model Output

Composites USA TAPs Analysis

Pollutant	CAS	Premise Emissions (lb/hr)	Screening Level			Allowable Emission Rate (AER)			TAP < AER?		
			1-hr	8-hr	Annual	1-hr	8-hr	Annual	1-hr	8-hr	Annual
Styrene	100-42-5	32.775	1704.05	852.02	NA	6.100	3.050	NA	No	No	NA
Vinyl Toluene	250113-15-4	2.494	4833.54	2416.77	NA	17.304	8.652	NA	Yes	Yes	NA
Phenol	108-95-2	2.500	NA	192.45	NA	NA	0.689	NA	NA	No	NA
Formaldehyde	50-00-0	0.250	NA	20.3	0.8	NA	0.073	0.0029	NA	No	No
Furaldehyde	98-01-1	0.084	NA	78.59	NA	NA	0.281	NA	NA	Yes	NA
Furfuryl alcohol	98-00-0	0.036	601.84	401.23	NA	2.155	1.436	NA	Yes	Yes	NA

Allowable Emission Rate (AER) for shorter, downwash, and/or fugitive sources: 1-hr and 8hr AER = SL x 0.00358

SCREEN3 Model Results

Pollutant	CAS	Emissions (lb/hr)	SCREEN3 1-hr Result	SCREEN3 8-hr Result*	SCREEN3 Annual Result*	Screening Level			SCREEN3 < Screening Level?		
						1-hr	8-hr	Annual	1-hr	8-hr	Annual
Styrene	100-42-5	32.775	459.8	321.86	NA	1704.05	852.02	NA	Yes	Yes	NA
Phenol	108-95-2	2.500	35.07	24.549	NA	NA	192.45	NA	Yes	Yes	NA
Formaldehyde	50-00-0	0.250	3.451	2.4157	0.276	NA	20.3	0.8	NA	Yes	Yes

* EPA recommended adjustment factors of 0.7 from 1-hr SCREEN3 results to 8-hr result; and 0.08 from 1-hr SCREEN3 results to annual result

SCREEN3 Model Inputs:

Stack:

Stack Height:	12.192	m
Stack Inside Diameter:	0.9144	m
Stack Exit Velocity:	19933.38855	m/s
ack Gas Exit Temperature:	293	K
Ambient Air Temperature:	293	K
Receptor Height:	0	m
Rural/Urban:	Rural	
Building Height:	7.0104	m
Min Building Dim:	48.768	m
Max Building Dim:	91.44	m
Distance to property line:	19.20	m

Emission Rates:

Styrene	4.13	g/s
Phenol	0.315	g/s
Formaldehyde	0.031	g/s

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*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

Composites USA; styrene

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	4.13000
STACK HEIGHT (M)	=	12.1920
STK INSIDE DIAM (M)	=	0.9144
STK EXIT VELOCITY (M/S)	=	14.3256
STK GAS EXIT TEMP (K)	=	293.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	7.0104
MIN HORIZ BLDG DIM (M)	=	48.7680
MAX HORIZ BLDG DIM (M)	=	91.4400

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

STACK EXIT VELOCITY WAS CALCULATED FROM
VOLUME FLOW RATE = 19933.391 (ACFM)

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 42.898 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
19.	0.1586E-02	5	1.0	1.1	10000.0	29.54	5.13	5.03	NO
100.	450.9	5	5.0	5.4	10000.0	19.52	6.47	9.31	HS
200.	416.8	5	5.0	5.4	10000.0	19.52	11.81	11.35	HS
300.	368.7	5	5.0	5.4	10000.0	19.52	17.02	13.29	HS
400.	319.2	5	5.0	5.4	10000.0	19.52	22.11	15.15	HS
500.	321.2	5	1.0	1.1	10000.0	29.54	27.47	13.73	NO
600.	398.9	5	1.0	1.1	10000.0	29.54	32.31	15.51	NO
700.	441.8	5	1.0	1.1	10000.0	29.54	37.10	17.24	NO
800.	458.2	5	1.0	1.1	10000.0	29.54	41.84	18.93	NO
900.	457.1	5	1.0	1.1	10000.0	29.54	46.53	20.58	NO

1000.	445.2	5	1.0	1.1	10000.0	29.54	51.18	22.19	NO
1100.	424.6	5	1.0	1.1	10000.0	29.54	55.79	23.50	NO
1200.	419.0	6	1.0	1.1	10000.0	27.79	40.26	16.28	NO
1300.	423.9	6	1.0	1.1	10000.0	27.79	43.27	17.06	NO
1400.	424.2	6	1.0	1.1	10000.0	27.79	46.26	17.83	NO
1500.	421.0	6	1.0	1.1	10000.0	27.79	49.23	18.57	NO
1600.	415.2	6	1.0	1.1	10000.0	27.79	52.18	19.30	NO
1700.	407.7	6	1.0	1.1	10000.0	27.79	55.12	20.02	NO
1800.	398.8	6	1.0	1.1	10000.0	27.79	58.04	20.72	NO
1900.	389.1	6	1.0	1.1	10000.0	27.79	60.94	21.41	NO
2000.	378.9	6	1.0	1.1	10000.0	27.79	63.83	22.08	NO
2100.	367.6	6	1.0	1.1	10000.0	27.79	66.71	22.65	NO
2200.	356.6	6	1.0	1.1	10000.0	27.79	69.57	23.21	NO
2300.	345.8	6	1.0	1.1	10000.0	27.79	72.42	23.76	NO
2400.	335.3	6	1.0	1.1	10000.0	27.79	75.25	24.30	NO
2500.	325.1	6	1.0	1.1	10000.0	27.79	78.07	24.83	NO
2600.	315.3	6	1.0	1.1	10000.0	27.79	80.89	25.35	NO
2700.	305.8	6	1.0	1.1	10000.0	27.79	83.69	25.86	NO
2800.	296.7	6	1.0	1.1	10000.0	27.79	86.48	26.36	NO
2900.	287.9	6	1.0	1.1	10000.0	27.79	89.26	26.85	NO
3000.	279.5	6	1.0	1.1	10000.0	27.79	92.03	27.34	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 19. M:

82.	459.8	5	5.0	5.4	10000.0	19.52	5.56	8.95	HS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
* SUMMARY OF TERRAIN HEIGHTS ENTERED FOR *
* SIMPLE ELEVATED TERRAIN PROCEDURE *
****

TERRAIN HT (M)	DISTANCE RANGE (M) MINIMUM	MAXIMUM
0.	19.	3000.

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 *** *** CAVITY CALCULATION - 2 ***

CONC (UG/M**3)	= 0.000	CONC (UG/M**3)	= 0.000
CRIT WS @10M (M/S)	= 99.99	CRIT WS @10M (M/S)	= 99.99
CRIT WS @ HS (M/S)	= 99.99	CRIT WS @ HS (M/S)	= 99.99
DILUTION WS (M/S)	= 99.99	DILUTION WS (M/S)	= 99.99
CAVITY HT (M)	= 7.01	CAVITY HT (M)	= 7.01
CAVITY LENGTH (M)	= 37.56	CAVITY LENGTH (M)	= 31.16
ALONGWIND DIM (M)	= 48.77	ALONGWIND DIM (M)	= 91.44

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	459.8	82.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

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*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

Composites USA, phenol

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.315000
STACK HEIGHT (M)	=	12.1920
STK INSIDE DIAM (M)	=	0.9144
STK EXIT VELOCITY (M/S)	=	14.3256
STK GAS EXIT TEMP (K)	=	293.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	7.0104
MIN HORIZ BLDG DIM (M)	=	48.7680
MAX HORIZ BLDG DIM (M)	=	91.4400

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

STACK EXIT VELOCITY WAS CALCULATED FROM
VOLUME FLOW RATE = 19933.391 (ACFM)

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 42.898 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
19.	0.1210E-03	5	1.0	1.1	10000.0	29.54	5.13	5.03	NO
100.	34.39	5	5.0	5.4	10000.0	19.52	6.47	9.31	HS
200.	31.79	5	5.0	5.4	10000.0	19.52	11.81	11.35	HS
300.	28.12	5	5.0	5.4	10000.0	19.52	17.02	13.29	HS
400.	24.35	5	5.0	5.4	10000.0	19.52	22.11	15.15	HS
500.	24.50	5	1.0	1.1	10000.0	29.54	27.47	13.73	NO
600.	30.43	5	1.0	1.1	10000.0	29.54	32.31	15.51	NO
700.	33.70	5	1.0	1.1	10000.0	29.54	37.10	17.24	NO
800.	34.95	5	1.0	1.1	10000.0	29.54	41.84	18.93	NO
900.	34.86	5	1.0	1.1	10000.0	29.54	46.53	20.58	NO

1000.	33.96	5	1.0	1.1	10000.0	29.54	51.18	22.19	NO
1100.	32.38	5	1.0	1.1	10000.0	29.54	55.79	23.50	NO
1200.	31.96	6	1.0	1.1	10000.0	27.79	40.26	16.28	NO
1300.	32.33	6	1.0	1.1	10000.0	27.79	43.27	17.06	NO
1400.	32.35	6	1.0	1.1	10000.0	27.79	46.26	17.83	NO
1500.	32.11	6	1.0	1.1	10000.0	27.79	49.23	18.57	NO
1600.	31.67	6	1.0	1.1	10000.0	27.79	52.18	19.30	NO
1700.	31.09	6	1.0	1.1	10000.0	27.79	55.12	20.02	NO
1800.	30.42	6	1.0	1.1	10000.0	27.79	58.04	20.72	NO
1900.	29.68	6	1.0	1.1	10000.0	27.79	60.94	21.41	NO
2000.	28.90	6	1.0	1.1	10000.0	27.79	63.83	22.08	NO
2100.	28.04	6	1.0	1.1	10000.0	27.79	66.71	22.65	NO
2200.	27.20	6	1.0	1.1	10000.0	27.79	69.57	23.21	NO
2300.	26.37	6	1.0	1.1	10000.0	27.79	72.42	23.76	NO
2400.	25.57	6	1.0	1.1	10000.0	27.79	75.25	24.30	NO
2500.	24.79	6	1.0	1.1	10000.0	27.79	78.07	24.83	NO
2600.	24.05	6	1.0	1.1	10000.0	27.79	80.89	25.35	NO
2700.	23.32	6	1.0	1.1	10000.0	27.79	83.69	25.86	NO
2800.	22.63	6	1.0	1.1	10000.0	27.79	86.48	26.36	NO
2900.	21.96	6	1.0	1.1	10000.0	27.79	89.26	26.85	NO
3000.	21.32	6	1.0	1.1	10000.0	27.79	92.03	27.34	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 19. M:

82.	35.07	5	5.0	5.4	10000.0	19.52	5.56	8.95	HS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
* SUMMARY OF TERRAIN HEIGHTS ENTERED FOR *
* SIMPLE ELEVATED TERRAIN PROCEDURE *
****

TERRAIN HT (M)	DISTANCE RANGE (M) MINIMUM	MAXIMUM
0.	19.	3000.

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 *** *** CAVITY CALCULATION - 2 ***

```
  CONC (UG/M**3)      =    0.000        CONC (UG/M**3)      =    0.000
  CRIT WS @10M (M/S)  =    99.99        CRIT WS @10M (M/S)  =    99.99
  CRIT WS @ HS (M/S)  =    99.99        CRIT WS @ HS (M/S)  =    99.99
  DILUTION WS (M/S)   =    99.99        DILUTION WS (M/S)   =    99.99
  CAVITY HT (M)       =     7.01        CAVITY HT (M)       =     7.01
  CAVITY LENGTH (M)   =    37.56        CAVITY LENGTH (M)   =    31.16
  ALONGWIND DIM (M)   =    48.77        ALONGWIND DIM (M)   =    91.44

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S.  CONC SET = 0.0

***************************************
      END OF CAVITY CALCULATIONS
***************************************


     ***************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     ***************************************

 CALCULATION        MAX CONC    DIST TO   TERRAIN
  PROCEDURE        (UG/M**3)    MAX (M)    HT (M)
--------------    -----------   ---------   -------
SIMPLE TERRAIN       35.07          82.        0.


*************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
*************************************************
```

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*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

Composites USA, formaldehyde

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.310000E-01
STACK HEIGHT (M)	=	12.1920
STK INSIDE DIAM (M)	=	0.9144
STK EXIT VELOCITY (M/S)	=	14.3256
STK GAS EXIT TEMP (K)	=	293.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	7.0104
MIN HORIZ BLDG DIM (M)	=	48.7680
MAX HORIZ BLDG DIM (M)	=	91.4400

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

STACK EXIT VELOCITY WAS CALCULATED FROM
VOLUME FLOW RATE = 19933.391 (ACFM)

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 42.898 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
19.	0.1191E-04	5	1.0	1.1	10000.0	29.54	5.13	5.03	NO
100.	3.384	5	5.0	5.4	10000.0	19.52	6.47	9.31	HS
200.	3.129	5	5.0	5.4	10000.0	19.52	11.81	11.35	HS
300.	2.767	5	5.0	5.4	10000.0	19.52	17.02	13.29	HS
400.	2.396	5	5.0	5.4	10000.0	19.52	22.11	15.15	HS
500.	2.411	5	1.0	1.1	10000.0	29.54	27.47	13.73	NO
600.	2.994	5	1.0	1.1	10000.0	29.54	32.31	15.51	NO
700.	3.316	5	1.0	1.1	10000.0	29.54	37.10	17.24	NO
800.	3.440	5	1.0	1.1	10000.0	29.54	41.84	18.93	NO
900.	3.431	5	1.0	1.1	10000.0	29.54	46.53	20.58	NO

1000.	3.342	5	1.0	1.1	10000.0	29.54	51.18	22.19	NO
1100.	3.187	5	1.0	1.1	10000.0	29.54	55.79	23.50	NO
1200.	3.145	6	1.0	1.1	10000.0	27.79	40.26	16.28	NO
1300.	3.182	6	1.0	1.1	10000.0	27.79	43.27	17.06	NO
1400.	3.184	6	1.0	1.1	10000.0	27.79	46.26	17.83	NO
1500.	3.160	6	1.0	1.1	10000.0	27.79	49.23	18.57	NO
1600.	3.117	6	1.0	1.1	10000.0	27.79	52.18	19.30	NO
1700.	3.060	6	1.0	1.1	10000.0	27.79	55.12	20.02	NO
1800.	2.993	6	1.0	1.1	10000.0	27.79	58.04	20.72	NO
1900.	2.921	6	1.0	1.1	10000.0	27.79	60.94	21.41	NO
2000.	2.844	6	1.0	1.1	10000.0	27.79	63.83	22.08	NO
2100.	2.760	6	1.0	1.1	10000.0	27.79	66.71	22.65	NO
2200.	2.676	6	1.0	1.1	10000.0	27.79	69.57	23.21	NO
2300.	2.595	6	1.0	1.1	10000.0	27.79	72.42	23.76	NO
2400.	2.516	6	1.0	1.1	10000.0	27.79	75.25	24.30	NO
2500.	2.440	6	1.0	1.1	10000.0	27.79	78.07	24.83	NO
2600.	2.366	6	1.0	1.1	10000.0	27.79	80.89	25.35	NO
2700.	2.295	6	1.0	1.1	10000.0	27.79	83.69	25.86	NO
2800.	2.227	6	1.0	1.1	10000.0	27.79	86.48	26.36	NO
2900.	2.161	6	1.0	1.1	10000.0	27.79	89.26	26.85	NO
3000.	2.098	6	1.0	1.1	10000.0	27.79	92.03	27.34	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 19. M:

82.	3.451	5	5.0	5.4	10000.0	19.52	5.56	8.95	HS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
* SUMMARY OF TERRAIN HEIGHTS ENTERED FOR *
* SIMPLE ELEVATED TERRAIN PROCEDURE *
****

TERRAIN HT (M)	DISTANCE RANGE (M) MINIMUM	MAXIMUM
0.	19.	3000.

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 *** *** CAVITY CALCULATION - 2 ***

```
  CONC (UG/M**3)      =    0.000         CONC (UG/M**3)      =    0.000
  CRIT WS @10M (M/S)  =    99.99         CRIT WS @10M (M/S)  =    99.99
  CRIT WS @ HS (M/S)  =    99.99         CRIT WS @ HS (M/S)  =    99.99
  DILUTION WS (M/S)   =    99.99         DILUTION WS (M/S)   =    99.99
  CAVITY HT (M)       =     7.01         CAVITY HT (M)       =     7.01
  CAVITY LENGTH (M)   =    37.56         CAVITY LENGTH (M)   =    31.16
  ALONGWIND DIM (M)   =    48.77         ALONGWIND DIM (M)   =    91.44

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S.  CONC SET = 0.0

**************************************
      END OF CAVITY CALCULATIONS
**************************************


     **************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     **************************************

 CALCULATION        MAX CONC    DIST TO   TERRAIN
  PROCEDURE        (UG/M**3)    MAX (M)    HT (M)
--------------    -----------   ---------   -------
SIMPLE TERRAIN       3.451          82.        0.


************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
************************************************
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Attachment F – Safety Data Sheets

Cellobond (Bakelite)
COR75-AQ-460D (Corrosion ISO Resin)
F798-APT-30 (Polyester Resin Solution)
Hetron 800 Resin (Ineos)

SAFETY DATA SHEET

FOR INDUSTRIAL USE ONLY

Section 1. Product and company identification

GHS product identifier	:	
MSDS Number	:	000000007771
Product type	:	Resin
Material uses	:	Industrial use.

Manufacturer/Supplier/Importer : Bakelite LLC
462 S 4th Street, Suite 1800
Louisville, KY
40202 USA

Contact person : sds@bakelite.com

Telephone : For additional health and safety or regulatory information, call (502) 449-6020

Emergency telephone number

Supplier	:	CARECHEM24
Telephone number	:	+1 215 207 0061

Section 2. Hazards identification

Classification of the substance or mixture : ACUTE TOXICITY:inhalation - Category 3
SKIN CORROSION/IRRITATION - Category 1B
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
RESPIRATORY SENSITISATION - Category 1
SKIN SENSITISATION - Category 1
GERM CELL MUTAGENICITY - Category 2
CARCINOGENICITY - Category 1B
SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE [eyes] - Category 1
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE [heart, skin, eyes, gastrointestinal tract, respiratory tract, kidneys, lungs, liver] - Category 2

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H331 Toxic if inhaled.
H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317 May cause an allergic skin reaction.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H370 Causes damage to organs: (eyes)
H373 May cause damage to organs through prolonged or repeated exposure. (heart, skin, eyes, gastrointestinal tract, respiratory tract, kidneys, lungs, liver)

Precautionary statements

General : Not applicable.

Prevention :
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Use personal protective equipment as required.
Wear protective gloves.
Wear eye or face protection.
Wear protective clothing.
In case of inadequate ventilation wear respiratory protection.
Use only outdoors or in a well-ventilated area.
Do not breathe vapor.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.
Contaminated work clothing should not be allowed out of the workplace.

Response :
Get medical attention if you feel unwell.
IF exposed:
Call a POISON CENTER or physician.
IF INHALED:
Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Immediately call a POISON CENTER or physician.
If experiencing respiratory symptoms:
Call a POISON CENTER or physician.
IF SWALLOWED:
Immediately call a POISON CENTER or physician.
Rinse mouth.
Do NOT induce vomiting.
IF ON SKIN (or hair):
Take off immediately all contaminated clothing.
Rinse skin with water or shower.
Wash contaminated clothing before reuse.
Immediately call a POISON CENTER or physician.
IF ON SKIN:
Wash with plenty of soap and water.
If skin irritation or rash occurs:
Get medical attention.
IF IN EYES:
Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or physician.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Other hazards which do not result in classification : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	% by weight	CAS number
Phenol	7 - 10	108-95-2
Sodium p-Toluenesulfonate	2 - 3	657-84-1
Formaldehyde	0.2 - 1	50-00-0

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.
Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In the event of any complaints or symptoms, avoid further exposure.

Skin contact : Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician.

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	:	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	:	No specific treatment.
Protection of first aid personnel	:	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media	:	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	:	None known.
Specific hazards arising from the chemical	:	In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous thermal decomposition products	:	Decomposition products may include the following materials: carbon dioxide carbon monoxide aldehydes (including formaldehyde) aromatic compounds including benzo[a]pyrene
Special protective actions for fire-fighters	:	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Special protective equipment for fire-fighters	:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	:	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and

		unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	:	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and material for containment and cleaning up

Small spill	:	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	:	Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13 of SDS). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 of SDS for emergency contact information and section 13 of SDS for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures	:	Put on appropriate personal protective equipment (see section 8 of SDS). Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
Advice on general occupational hygiene	:	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	:	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area,

away from incompatible materials (see section 10 of SDS) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Phenol	**ACGIH TLV (1996-05-18)** **TWA** 19 mg/m3 5 ppm Notes: Absorbed through skin. **OSHA PEL 1989 (1989-03-01)** **TWA** 19 mg/m3 5 ppm Notes: Absorbed through skin. **OSHA PEL (1993-06-30)** **TWA** 19 mg/m3 5 ppm Notes: Absorbed through skin. **NIOSH REL (1994-06-01)** **TWA - TLV and PEL** 19 mg/m3 5 ppm Notes: Absorbed through skin. **CEIL** 60 mg/m3 15.6 ppm Notes: Absorbed through skin.
Formaldehyde	**OSHA PEL 1989 (1989-03-01)** **TWA** 0.75 ppm **STEL** 2 ppm **OSHA PEL Z2 (1993-06-30)** **TWA** 0.75 ppm **STEL** 2 ppm **OSHA PEL (1993-06-30)** **TWA** 0.75 ppm **STEL** 2 ppm **NIOSH REL (1994-06-01)** **TWA - TLV and PEL** 0.016 ppm **CEIL** 0.1 ppm **ACGIH TLV (2017-03-01)** **STEL** 0.3 ppm Notes: Inhalation sensitizer Skin sensitizer **TWA** 0.1 ppm Notes: Inhalation sensitizer Skin sensitizer

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local

exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid

Color	:	Clear, reddish-brown
Odor	:	Phenolic.
Odor threshold	:	Not available
pH	:	7.3 - 7.8
Melting point/ Freezing point	:	Not determined
Boiling point	:	116 °C (241 °F)
Flash point	:	Setaflash Closed Cup: Less than 93.34 °C (200.01 °F) (ASTM D 3828)
Burning time	:	Not available
Burning rate	:	Not available
Evaporation rate	:	Not available
Flammability (solid, gas)	:	Not available
Lower and upper explosive (flammable) limits	:	**Lower:** Not applicable. **Upper:** Not applicable.
Vapor pressure	:	16 mm Hg @ 25 °C (77 °F)
Vapor density	:	1.0 [Air = 1]
Relative density	:	1.2300
Solubility	:	Not available
Solubility in water	:	Not available
Partition coefficient: n-octanol/water	:	Not available
Auto-ignition temperature	:	Not available
Decomposition temperature	:	Not available
SADT	:	Not available
Viscosity	:	**Dynamic:** Not available **Kinematic:** Not available

Other information

No additional information.

Section 10. Stability and reactivity

Reactivity	:	Stable under normal conditions.
Chemical stability	:	The product is stable.
Possibility of hazardous reactions	:	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	:	Avoid exposure - obtain special instructions before use.No specific data.

Incompatible materials : No specific data.No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Phenol				
	LD50 Oral	Rat	317 mg/kg	-
	LC50 Inhalation	Rat	0.9 mg/l	8 h
	LD50 Dermal	Rabbit	630 mg/kg	-
Formaldehyde				
	LD50 Oral	Rat	800 mg/kg	-
	LC50 Inhalation	Rat	0.578 mg/l	2 h
	LD50 Oral	Rat	> 2,001 mg/kg	-
	LC50 Inhalation	Rat		1 h
	LD50 Dermal	Rabbit	> 2,001 mg/kg	-

Conclusion/Summary : Not available

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Phenol	Skin - -	Rat	> 4		-
	eyes - Cornea opacity	Rabbit	> 3		-
Formaldehyde	Skin - Erythema/Eschar	Rabbit	2.5	20 hrs	-
	Skin - Edema	Rabbit	3	20 hrs	-
	eyes - Cornea opacity	Mouse	> 3		-

Conclusion/Summary

Skin : Not available

eyes : Not available

Respiratory : Not available

Sensitization

Conclusion/Summary

Skin : Not available

Respiratory : Not available

Mutagenicity

Conclusion/Summary : Not available

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
Formaldehyde	- - - - -	-		
Remarks:	The National Toxicology Program (NTP) classifies formaldehyde as "known to be a human carcinogen" with respect to nasopharyngeal cancer, sinonasal cancer and myeloid leukemia. The International Agency for Research on Cancer (IARC) classifies formaldehyde as "carcinogenic to humans". U.S. OSHA regulates formaldehyde as a potential human carcinogen. See the OSHA Formaldehyde Workplace Standard at 29 CFR 1920.1048 (the "OSHA Standard"). Safe handling and use instructions are provided in this SDS and in the OSHA Standard. OSHA has identified 0.5 ppm, calculated as an eight-hour time-weighted average ("TWA") concentration, as the "Action Level". Please review and understand the guidance contained in this MSDS, and refer to the OSHA Standard for regulatory requirements that might be applicable to your operation and use. Many studies and other evaluations have been performed concerning formaldehyde's potential to cause cancer. To review some of these studies and for further information go to www.osha.gov/SLTC/formaldehyde; http://monographs.iarc.fr; http://ntp-server.niehs.nih.gov; http://epa.gov/iris/subst/0419.htm; http://www.nap.edu/catalog.php?record_id=13142 and other authoritative websites.			

Conclusion/Summary : Not available

Reproductive toxicity

Conclusion/Summary : Not available

Teratogenicity

Conclusion/Summary : Not available

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Phenol	Category 1		eyes
Sodium p-Toluenesulfonate	Category 3		Respiratory tract irritation
Formaldehyde	Category 3		Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Phenol	Category 2		gastrointestinal tract kidneys eyes heart lungs liver skin

Formaldehyde	Category 2		respiratory tract skin

Aspiration hazard

Not available

Information on likely routes of exposure : Not available

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Toxic if inhaled. May give off gas, vapour or dust that is very irritating or corrosive to the respiratory system. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin contact : Causes severe burns. May cause an allergic skin reaction.

Ingestion : May cause burns to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : Adverse symptoms may include the following:
wheezing and breathing difficulties
asthma

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available

Potential delayed effects : Not available

Long term exposure

Potential immediate effects : Not available

Potential delayed effects : Not available

Potential chronic health effects

Conclusion/Summary : Not available

General : May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : May cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : Suspected of causing genetic defects.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Phenol			
	Acute LC50 8.9 mg/l Fresh water	Fish - Rainbow trout,donaldson trout	96 h
	Acute No-observable-effect-concentration 0.077 mg/l Fresh water	Fish - Carp	60 d
	Acute EC50 3.1 mg/l Fresh water	Aquatic invertebrates. Water flea	48 h
	Acute No-observable-effect-concentration 0.16 mg/l Fresh water	Aquatic invertebrates. Water flea	16 d
	Acute EC50 61.1 mg/l Fresh water	Aquatic plants - Microalgae	96 h
	Acute EC50 21 mg/l Fresh water	Micro-organism - Soil organisms	24 h
	Chronic No-observable-effect-concentration 2.2 mg/l Fresh water	Aquatic invertebrates. Water flea	2 d
formaldehyde			
	Acute LC50 6.7 mg/l -	Fish - Striped bass	96 h
	Acute LC50 6.9 mg/l -	Fish - Zebra danio	6 d
	Acute No-observable-effect-concentration > 47.9 mg/l -	Fish - Medaka, high-eyes	28 d
	Acute EC50 5.8 mg/l Fresh water	Aquatic invertebrates. Water flea	2 d
	Acute EC50 4.9 mg/l Fresh water	Aquatic plants - Algae	72 h
	Acute EC50 4.3 mg/l Fresh water	Aquatic plants - Algae	48 h
	Acute EC50 19 mg/l -	Micro-organism - Soil organisms	3 h

Conclusion/Summary : Not available

Persistence/degradability

Conclusion/Summary : Not available

Bioaccumulative potential

Product/ingredient name	LogPow	BCF	Potential

Phenol	1.5	17.5	
sodium toluene-4-sulphonate	-3.18	-	low
formaldehyde	0.35	< 1	

Mobility in soil

Soil/water partition coefficient (KOC) : Not available

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

The data provided in this section is for information only and may not be specific to your package size or mode of transport. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

International transport regulations

Regulatory information	UN/NA number	Proper shipping name	Classes/*PG	Reportable Quantity (RQ)
CFR	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Phenol, Formaldehyde)	Class 9 III	Phenol, Formaldehyde
TDG		Non-regulated		
IMO/IMDG		Non-regulated		
IATA (Cargo)		Non-regulated		

*PG : Packing group

Special precautions for user : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons

transporting the product know what to do in the event of an accident or spillage.

Section 15. Regulatory information

United States

U.S. Federal regulations : **United States - TSCA 12(b) - Chemical export notification:** None required.
United States - TSCA 5α2 - Final significant new use rules: Not listed
United States - TSCA 5α2 - Proposed significant new use rules: Not listed
United States - TSCA 5(e) - Substances consent order: Not listed
SARA 311/312 Classification - Immediate (acute) health hazard, Delayed (chronic) health hazard

SARA 313

Form R - Reporting requirements

Product name	CAS number
Phenol	108-95-2
Formaldehyde	50-00-0

Supplier notification

Product name	CAS number
Phenol	108-95-2
Formaldehyde	50-00-0

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

California Prop. 65:

WARNING: This product may contain one or more chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

United States inventory (TSCA 8b) : All components are active or exempted.

International regulations

International lists : **Australia inventory (AICS):** All components are listed or exempted.
Canada inventory: All components are listed or exempted.
Japan inventory: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Korea inventory (KECI): All components are listed or exempted.
New Zealand Inventory (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.

United States inventory (TSCA 8b): All components are active or exempted.

Section 16. Other information

Hazardous Material Information System III (U.S.A.) :

Health	*	3
Flammability		1
Physical hazards		0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.
The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

Full text of abbreviated H statements : Not applicable.

History

Date of printing : 01/11/2023
Date of issue/Date of revision : 04/17/2020
Date of previous issue : 05/06/2015
Version : 4.1
Prepared by : Product Safety Stewardship
Key to abbreviations :
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978 ("Marpol" = marine pollution)
RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
UN = United Nations
References : Not available

Notice to reader

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

SAFETY DATA SHEET

CORROSION ISO RESIN

Section 1. Identification

Product identifier : CORROSION ISO RESIN

Product code : COR75-AQ-460D

Other means of identification : Unsaturated Polyester Resin

Product type : Liquid.

Product use : Industrial applications.

Supplier's details : IP CORPORATION
1225 Willow Lake Blvd
St. Paul, MN 55110
651-481-6860

Emergency telephone number (with hours of operation) : CHEMTREC 24-Hour Emergency Telephone
US and Canada 800.424.9300
Outside US and Canada +1 703.741.5970

Section 2. Hazard identification

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 3
ACUTE TOXICITY (inhalation) - Category 4
SKIN IRRITATION - Category 2
EYE IRRITATION - Category 2A
CARCINOGENICITY - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Flammable liquid and vapor.
Causes skin irritation.
Causes serious eye irritation.
Harmful if inhaled.
May cause cancer.

Precautionary statements

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves, protective clothing and eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Wash thoroughly after handling.

Response : IF exposed or concerned: Get medical advice or attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. If skin irritation occurs: Get medical advice or attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice or attention.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Section 2. Hazard identification

Supplemental label elements : Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 13.1%

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Unsaturated Polyester Resin

CAS number/other identifiers

CAS number : Not applicable.

Product code : COR75-AQ-460D

Ingredient name	% (w/w)	CAS number
styrene	36.13	CAS: 100-42-5
vinyl toluene	13.10	CAS: 25013-15-4

Ranges if listed above for hazardous ingredient(s) are prescribed ranges. The actual concentration(s) or actual concentration range(s) are being withheld as a trade secret.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Remove contaminated clothing and shoes. Flush contaminated skin with plenty of water. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Harmful if inhaled.

Skin contact : Causes skin irritation.

Ingestion : No known significant effects or critical hazards.

Section 4. First-aid measures

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : Flammable liquid and vapor. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

Section 6. Accidental release measures

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Do not store above the following temperature: 38°C (100.4°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. Store containers in a safe place.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Vinyl benzene	**CA Saskatchewan Provincial (Canada, 4/2021)** STEL 15 minutes: 40 ppm. TWA 8 hours: 20 ppm. **CA British Columbia Provincial (Canada, 4/2024)** Carc 2A. TWA 8 hours: 20 ppm. STEL 15 minutes: 40 ppm. **CA Ontario Provincial (Canada, 6/2019)** TWA 8 hours: 35 ppm. STEL 15 minutes: 100 ppm. **CA Quebec Provincial (Canada, 2/2024)** TWAEV 8 hours: 50 ppm. STEV 15 minutes: 75 ppm. **CA Alberta Provincial (Canada, 3/2023)** OEL 15 minutes: 40 ppm. OEL 15 minutes: 170 mg/m³. OEL 8 hours: 85 mg/m³. OEL 8 hours: 20 ppm.
Vinyltoluene	**CA Saskatchewan Provincial (Canada, 4/2021)** STEL 15 minutes: 100 ppm. TWA 8 hours: 50 ppm. **CA British Columbia Provincial (Canada, 4/2024) [vinyl toluene, all isomers]** TWA 8 hours: 25 ppm. STEL 15 minutes: 75 ppm. **CA Ontario Provincial (Canada, 6/2019) [Vinyl toluene]** STEL 15 minutes: 100 ppm. TWA 8 hours: 50 ppm. **CA Quebec Provincial (Canada, 2/2024) [Vinyl toluene]** TWAEV 8 hours: 50 ppm. TWAEV 8 hours: 242 mg/m³. STEV 15 minutes: 100 ppm. STEV 15 minutes: 483 mg/m³. **CA Alberta Provincial (Canada, 3/2023) [Methyl styrene]** OEL 15 minutes: 100 ppm. OEL 8 hours: 50 ppm. OEL 15 minutes: 483 mg/m³. OEL 8 hours: 242 mg/m³.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Section 8. Exposure controls/personal protection

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : Various

Odor : Aromatic. Sweetish.

Odor threshold : 0.1 ppm

pH : Not applicable.

Melting point : Not applicable.

Boiling point : 145 to 168°C (293 to 334.4°F)

Flash point : Closed cup: >31°C (>87.8°F)

Evaporation rate : <1 (butyl acetate = 1)

Lower and upper explosive (flammable) limits : Lower: 0.9%
Upper: 6.8%

Vapor pressure : 0.2 to 0.67 kPa (1.5 to 5 mm Hg)

Vapor density : 3.6 [Air = 1]

Relative density : 0.9 to 1.3

Partition coefficient: n-octanol/water : Not applicable.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Dynamic (room temperature): Not available.
Kinematic (room temperature): Not available.
Kinematic (40°C (104°F)): Not available.

VOC content (industrial use) 49.3 % (w/w) As shipped, including monomer.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Hazardous reactions or instability may occur under certain conditions of storage or use.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
Hazardous polymerization may occur under certain conditions of storage or use. Keep away from heat and direct sunlight. Keep away from heat and flame. Keep away from oxidizing agents.

Incompatible materials : Reactive or incompatible with the following materials:
oxidizing materials
Reactive or incompatible with the following materials: metals, acids and alkalis. Incompatible with alkali metals. Incompatible with some alkalis. Incompatible with some strong acids. Incompatible with copper alloys., brass.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Vinyl benzene	LC50 Inhalation Gas.	Rat	2770 ppm	4 hours
	LC50 Inhalation Vapor	Rat	11800 mg/m³	4 hours
	LD50 Oral	Rat	2650 mg/kg	-
Vinyltoluene	LD50 Oral	Rat	2255 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Vinyl benzene	Eyes - Mild irritant	Human	-	50 ppm	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg	-
	Eyes - Severe irritant	Rabbit	-	100 mg	-
	Skin - Mild irritant	Rabbit	-	500 mg	-
	Skin - Moderate irritant	Rabbit	-	100 %	-
Vinyltoluene	Eyes - Mild irritant	Rabbit	-	90 mg	-
	Skin - Moderate irritant	Rabbit	-	100 %	-

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Section 11. Toxicological information

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Vinyltoluene	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Name	Result
Vinyl benzene	ASPIRATION HAZARD - Category 1
Vinyltoluene	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Harmful if inhaled.

Skin contact : Causes skin irritation.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : May cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Section 11. Toxicological information

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Oral	5142.97 mg/kg
Inhalation (gases)	6662.05 ppm
Inhalation (vapors)	28.38 mg/l

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Vinyl benzene	Acute EC50 1400 µg/l Fresh water	Algae - *Raphidocelis subcapitata*	72 hours
	Acute EC50 720 µg/l Fresh water	Algae - *Raphidocelis subcapitata*	96 hours
	Acute EC50 4700 µg/l Fresh water	Daphnia - *Daphnia magna*	48 hours
	Acute LC50 52 mg/l Marine water	Crustaceans - *Artemia salina*	48 hours
	Acute LC50 4020 µg/l Fresh water	Fish - *Pimephales promelas*	96 hours
	Chronic NOEC 63 µg/l Fresh water	Algae - *Raphidocelis subcapitata*	96 hours
Vinyltoluene	Acute EC50 1 to 10 mg/l Fresh water	Daphnia - *Daphnia magna*	48 hours
	Acute LC50 8.9 mg/l Marine water	Crustaceans - *Chaetogammarus marinus* - Young	48 hours

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
Vinyl benzene	OECD	70 % - Readily - 28 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Vinyl benzene	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Vinyl benzene	2.96	13.49	Low
Vinyltoluene	3.35	100 to 320	Low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or

Section 13. Disposal considerations

liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	TDG Classification	DOT Classification	IMDG	IATA
UN number	UN1866	UN1866	UN1866	UN1866
UN proper shipping name	RESIN SOLUTION	RESIN SOLUTION	RESIN SOLUTION	RESIN SOLUTION
Transport hazard class(es)	3 	3 	3 	3 
Packing group	III	III	III	III
Environmental hazards	No.	No.	No.	No.
Additional information	Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.18-2.19 (Class 3).	**Reportable quantity** 2767.6 lbs / 1256.5 kg [301.76 gal / 1142.3 L]. Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.	-	-

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

Canadian lists

Canadian NPRI : The following components are listed: styrene; styrene

CEPA Toxic substances : None of the components are listed.

Canada inventory : Not determined.

Inventory list

Australia : Not determined.

China : Not determined.

Eurasian Economic Union : **Russian Federation inventory**: Not determined.

Japan : **Japan inventory (CSCL)**: Not determined.
Japan inventory (ISHL): Not determined.

Malaysia : Not determined

Section 15. Regulatory information

New Zealand	: Not determined.
Philippines	: Not determined.
Republic of Korea	: Not determined.
Taiwan	: Not determined.
Turkey	: Not determined.
United States	: All components are active or exempted.

Section 16. Other information

History

Date of printing	: 2/5/2025
Date of issue/Date of revision	: 2/5/2025
Date of previous issue	: 11/22/2024
Version	: 1.03
Prepared by	Health, Safety and Environmental
Email	For questions about the SDS, contact iasafety@ip-corporation.com
Key to abbreviations	: ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations HPR = Hazardous Products Regulations

Procedure used to derive the classification

Classification	Justification
FLAMMABLE LIQUIDS - Category 3	On basis of test data
ACUTE TOXICITY (inhalation) - Category 4	Calculation method
SKIN IRRITATION - Category 2	Calculation method
EYE IRRITATION - Category 2A	Calculation method
CARCINOGENICITY - Category 1	Calculation method

References : Canada Hazardous Products Regulations SOR/2015-17

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

AOC
Trusted Solutions

SAFETY DATA SHEET

Date of issue: 04/15/2022
Date of previous issue: 10/14/2020

Section 1. Identification

Product name F798-APT-30
Product type Polyester Resin Solution
Chemical family Aromatic.
SDS No. NA-2010:6218 (Version: 2.0)

Relevant identified uses of the substance or mixture and uses advised against
Identified uses Used in the manufacture of thermoset plastic parts.
Uses advised against No additional information.

Supplier's details

United States:

AOC
955 Highway 57 East
Collierville, TN 38017
Phone Number: (901) 854-2800
Hours: 8AM-5pm (Central Time) Mon-Fri
E-Mail: aoc.sds@aocresins.com
Website: www.aocresins.com

Canada:

AOC
38 Royal Road
Guelph, Ontario Canada N1H 1G3
Phone Number: (519) 821-5180
Hours: 8am-5pm (Eastern) Mon-Fri

Emergency telephone number

CHEMTREC Within USA and Canada	+1 (800) 424-9300	CCN1023
CHEMTREC Outside USA and Canada	+1 (703) 527-3887	
CANUTEC Within Canada	+1 (613) 996-6666	

Section 2. Hazards identification

OSHA/HCS status
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture
FLAMMABLE LIQUIDS – Category 3 – H226
ACUTE TOXICITY (Inhalation) – Category 4 – H332
SKIN IRRITATION – Category 2 – H315
EYE IRRITATION – Category 2A – H319
CARCINOGENICITY – Category 2 – H351
REPRODUCTIVE TOXICITY – Category 2 – H361d
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) – Category 3 – H335
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) – Category 1 – H372
ASPIRATION HAZARD – Category 1 – H304

GHS label elements
Hazard pictograms

Signal word
Danger

Hazard statements
H226: Flammable liquid and vapor.
H332: Harmful if inhaled.
H319: Causes serious eye irritation.
H315: Causes skin irritation.
H361d: Suspected of damaging the unborn child.
H351: Suspected of causing cancer.
H304: May be fatal if swallowed and enters airways.
H335: May cause respiratory irritation.
H372: Causes damage to organs through prolonged or repeated exposure. (hearing organs, kidneys)

Precautionary statements
General

Section 2. Hazards identification

P101 If medical advice is needed, have product container or label at hand
P102 Keep out of reach of children

Prevention

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood
P280: Wear protective gloves/protective clothing/eye protection/face protection
P210: Keep away from heat, sparks and hot surfaces. - No smoking.
P240. Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting/material-handling equipment.
P242: Use only non-sparking tools
P243: Take precautionary measures against static discharge.
P233· Keep container tightly closed.
P271: Use only outdoors or in a well-ventilated area.
P260. Do not breathe vapor or mist
P270: Do not eat, drink or smoke when using this product
P264. Wash hands thoroughly after handling

Response

P314: Get medical attention if you feel unwell
P308+P313: IF exposed or concerned: Get medical attention.
P304+P340: IF INHALED Remove victim to fresh air and keep at rest in a position comfortable for breathing
P312 Call a POISON CENTER or physician if you feel unwell
P370+P378. In case of fire. Use dry chemical, CO_2, water spray (fog) or foam
P301+P310· IF SWALLOWED Immediately call a POISON CENTER or doctor/physician.
P331: Do NOT induce vomiting.
P308+P313: IF exposed or concerned: Get medical advice/attention.
P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P362+P364: Take off contaminated clothing and wash it before reuse
P332+P313: If skin irritation occurs: Get medical attention
P305+P351+P338. IF IN EYES: Rinse cautiously with water for several minutes Remove contact lenses, if present and easy to do Continue rinsing.
P337+P313: If eye irritation persists: Get medical attention
P391: Collect spillage.

Storage

P405: Store locked up.
P403+P235: Store in a well-ventilated place. Keep cool
P233· Keep container tightly closed.

Disposal

P501: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified

None known.

Section 3. Composition/information on ingredients

Substance/mixture Mixture.

Ingredient name	CAS number	%
styrene	100-42-5	39.2
vinyltoluene	25013-15-4	≤10
cobalt bis(2-ethylhexanoate)	136-52-7	≤0.3

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids Use of buffered baby shampoo will aid in removal. If irritation persists, get medical attention.

Inhalation

Move the victim to a safe area as soon as possible Allow the victim to rest in a well-ventilated area. If breathing is difficult, give oxygen If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention

Skin contact

Section 4. First aid measures

In case of contact, immediately flush skin with plenty of water Remove contaminated clothing and shoes If irritation persists, seek medical attention Wash contaminated clothing before reuse Clean shoes thoroughly before reuse

Ingestion

Wash out mouth with water Remove dentures if any Stop if the exposed person feels sick as vomiting may be dangerous Do not induce vomiting unless directed to do so by medical personnel If vomiting occurs, the head should be kept low so that vomit does not enter the lungs Seek immediate medical attention

Most important symptoms/effects, acute and delayed

Eye contact

Causes serious eye irritation

Inhalation

Harmful if inhaled May cause respiratory irritation May cause drowsiness or dizziness

Skin contact

Causes skin irritation

Ingestion

Irritating to mouth, throat and stomach

Over-exposure signs/symptoms

Eye contact

Adverse symptoms may include the following pain or irritation, watering, redness

Inhalation

Adverse symptoms may include the following respiratory tract irritation, coughing

Skin contact

Adverse symptoms may include the following irritation, redness

Ingestion

Adverse symptoms may include the following Irritating to mouth, throat and stomach

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician

Treat symptomatically Contact poison treatment specialist immediately if large quantities have been ingested or inhaled

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Use dry chemical, CO_2, water spray (fog) or foam

Unsuitable extinguishing media

Do not use water jet

Specific hazards arising from the chemical

Flammable liquid and vapor In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion The vapor/gas is heavier than air and will spread along the ground Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back Runoff to sewer may create fire or explosion hazard This material is harmful to aquatic life with long lasting effects Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain

Hazardous thermal decomposition products

Decomposition products may include the following materials carbon dioxide

Special protective actions for fire-fighters

Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation.

For emergency responders

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. See also the information in "For non-emergency personnel".

Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

Small spill

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

Large spill

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not breathe vapor or mist. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Segregate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Refer to the product label and/or technical data sheet for further information.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
styrene	**ACGIH TLV (United States, 1/2021). Ototoxicant.** TWA: 10 ppm 8 hours STEL: 20 ppm 15 minutes **OSHA PEL Z2 (United States, 2/2013).** TWA: 100 ppm 8 hours CEIL: 200 ppm AMP: 600 ppm 5 minutes **NIOSH REL (United States, 10/2020).** TWA: 50 ppm 10 hours TWA: 215 mg/m³ 10 hours STEL: 100 ppm 15 minutes

Section 8. Exposure controls/personal protection

vinyltoluene	STEL. 425 mg/m³ 15 minutes. **ACGIH TLV (United States, 1/2021).** TWA: 50 ppm 8 hours. TWA: 242 mg/m³ 8 hours. STEL: 100 ppm 15 minutes. STEL: 483 mg/m³ 15 minutes. **NIOSH REL (United States, 10/2020).** TWA: 100 ppm 10 hours. TWA: 480 mg/m³ 10 hours. **OSHA PEL (United States, 5/2018).** TWA: 100 ppm 8 hours. TWA: 480 mg/m³ 8 hours.
cobalt bis(2-ethylhexanoate)	**OSHA PEL (United States).** TWA: 0.1 mg/m³ **ACGIH TLV (United States, 1/2021). Skin sensitizer. Inhalation sensitizer.** TWA: 0.02 mg/m³, (as Co) 8 hours.

Appropriate engineering controls

Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state	Liquid.
Color	Amber.
Odor	Aromatic.
Odor threshold	0.01 - 0.1 ppm (*Styrene*)
pH	*Not applicable.*
Melting point	¯23.8°F / ¯30.6°C (*Styrene*)
Boiling point	293°F / 145°C (*Styrene*)
Flash point	88°F / 31°C (*Styrene*)
Evaporation rate	< 1 (Butyl acetate = 1)
Flammability (solid, gas)	*Not applicable.*
Lower and upper explosive (flammable) limits	**Lower:** 1.1% **Upper:** 6.1% (*Styrene*)
Vapor pressure	5.0 mm Hg@ 68°F / 20°C (*Styrene*)
Vapor density	3.6 (Air = 1) (*Styrene*)
Relative density	1.1 (Water = 1)
Solubility	Slight.

Section 9. Physical and chemical properties

Partition coefficient: n-octanol/water Not available
Auto-ignition temperature 914°F / 490°C (*Styrene*)
Decomposition temperature Not available
Viscosity Not available.
Molecular weight 1,000 to 15,000

Section 10. Stability and reactivity

Reactivity

No specific test data related to reactivity available for this product or its ingredients

Chemical stability

The product is stable Stable under recommended storage and handling conditions (see Section 7)

Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur

Conditions to avoid

Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Incompatible materials

Reactive or incompatible with the following materials oxidizing materials

Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Ingredient name	Result	Species	Dose	Exposure
styrene	LC50 Inhalation Gas	Rat	2770 ppm	4 hours
	LC50 Inhalation Vapor	Rat	11800 mg/m³	4 hours
	LC50 Inhalation Vapor	Rat	5634 2 ppm	4 hours
	LD50 Oral	Rat	2650 mg/kg	-
vinyltoluene	LD50 Oral	Rat	2255 mg/kg	-
cobalt bis(2-ethylhexanoate)	LD50 Dermal	Rabbit	>5 g/kg	-
	LD50 Oral	Rat	1 22 g/kg	-

Irritation/Corrosion

Ingredient name	Result	Species	Score	Exposure	Observation
styrene	Eyes - Mild irritant	Human	-	50 ppm	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg	-
	Eyes - Severe irritant	Rabbit	-	100 mg	-
	Skin - Mild irritant	Rabbit	-	500 mg	-
	Skin - Moderate irritant	Rabbit	-	100 %	-
vinyltoluene	Eyes - Mild irritant	Rabbit	-	90 mg	-
	Skin - Moderate irritant	Rabbit	-	100 %	-

Sensitization

No data on skin sensitization due to this product

Carcinogenicity

Classification

Ingredient name	ACGIH	IARC	NTP
styrene	-	2A	Reasonably anticipated to be a human carcinogen
vinyltoluene	-	3	-
cobalt bis(2-ethylhexanoate)	-	2B	Reasonably anticipated to be a human carcinogen

1) Negative Study A published study concluded that the mechanism for producing cancer in mice exposed to styrene is not applicable in human metabolism (June 2013 Pharmacology & Toxicology 66 (2013))
2) Negative Study A recent update to an extensive study of reinforced plastic workers from 1948-1977 concluded that there was no coherent evidence that styrene exposure increased risk of cancer (March 2013 Epidemiology Vol 24 Issue 2)
3) Positive Study Styrene induced pulmonary toxicity and carcinogenicity in mice was shown to be caused by a metabolite of styrene, probably styrene oxide (Dec 2001 Toxicology Vol 169 Issue 2)

Mutagenicity

No known significant effects or critical hazards

Reproductive toxicity

Section 11. Toxicological information

Suspected of damaging the unborn child

Teratogenicity

No known significant effects or critical hazards

Specific target organ toxicity (single exposure)

May cause respiratory irritation

Specific target organ toxicity (repeated exposure)

A study of long term effects of workers exposed to styrene levels in the range of 25-35 ppm, 8 hour TWA, indicated a possible mild hearing loss

Aspiration hazard

May be fatal if swallowed and enters airways

Potential acute health effects

Eye contact

Causes serious eye irritation

Inhalation

Harmful if inhaled May cause respiratory irritation May cause drowsiness or dizziness

Skin contact

Causes skin irritation

Ingestion

Irritating to mouth, throat and stomach

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact

Adverse symptoms may include the following pain or irritation, watering, redness

Inhalation

Adverse symptoms may include the following respiratory tract irritation, coughing

Skin contact

Adverse symptoms may include the following irritation, redness

Ingestion

Adverse symptoms may include the following Irritating to mouth, throat and stomach

Section 12. Ecological information

Toxicity

Ingredient name	Result	Species	Exposure
styrene	Acute EC50 78000 µg/l Marine water	Algae - Skeletonema costatum	96 hours
	Acute EC50 4700 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 52 mg/l Marine water	Crustaceans - Artemia salina	48 hours
	Acute LC50 4020 µg/l Fresh water	Fish - Pimephales promelas	96 hours
vinyltoluene	Acute EC50 1 to 10 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 8 9 mg/l Marine water	Crustaceans - Chaetogammarus marinus - Young	48 hours

Persistence and degradability

Not available

Bioaccumulative potential

Ingredient name	$LogP_{ow}$	BCF	Potential
styrene	0 35	13 49	low
vinyltoluene	3 35	100 to 320	low
cobalt bis(2-ethylhexanoate)	-	15600	high

Mobility in soil

Soil/water partition coefficient (K_{OC})

Not available

Other adverse effects

No known effect according to our database

Section 13. Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

Disposal methods

The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid disposal. Attempt to use product completely in accordance with intended use. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions

This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

DOT /TDG / IMDG/IMO / ICAO/IATA and National regulations.

UN number: UN1866

Proper shipping name: Resin Solution

Transport hazard class(es): 3

Packing group: III

Additional information: US regulations require the reporting of spills when the amount exceeds the Reportable Quantity (RQ) for specific components of this material. See CERCLA in Section 15, Regulatory Information, for the Reportable Quantities.

IMDG Emergency schedules (EmS): F-E, S-E
Remarks: FP- 31°C

IATA No additional information

Environmental hazards: Marine pollutant: No.

Special precautions for user: **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 15. Regulatory information

International regulations lists

United States inventory (TSCA 8b)	All components are active or exempted.
Australia (AICS)	All components are listed or exempted
Canada (DSL)	All components are listed or exempted.
China (IECSC)	**Not determined.**
Europe (EINECS)	**Not determined.**
New Zealand (NZIoC)	**Not determined.**
Philippines (PICCS)	At least one component is **not listed**
Japan (ENCS)	All components are listed or exempted.
Republic of Korea (KECI)	All components are listed or exempted
Taiwan (CSNN)	All components are listed or exempted

U.S. Federal regulations

SARA 311/312

Per the June 13, 2016 Federal Register notice, EPA harmonized the EPCRA 311/312 hazard categories with the 2012 OSHA hazard communication standard for classifying and labeling of chemicals (i e GHS). Please refer to Section 2 of the SDS to identify the appropriate hazard categories for reporting purposes.

SARA 313

	Ingredient name	CAS number
Form R - Reporting requirements	styrene cobalt bis(2-ethylhexanoate)	100-42-5 136-52-7

Section 15. Regulatory information

CERCLA RQ - styrene - 1000 lbs. (453.6 kg)

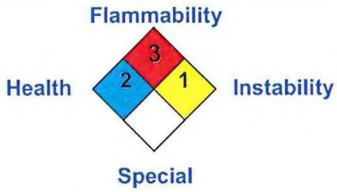
State regulations

California Prop. 65

⚠ **WARNING**: This product can expose you to chemicals including Styrene and α-Methyl styrene, which are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca gov.

Section 16. Other information

National Fire Protection Association (U.S.A.)



History

Date of issue	04/15/2022
Date of previous issue	10/14/2020
Version	2.0
Prepared by	AOC Corporate Regulatory Affairs
Key to abbreviations	ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations

Indicates information that has changed from previously issued version.

Notice to reader

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29 CFR 1910.1200 (OSHA HazCom 2012)

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product identifier

Trade name : Hetron™ 800
RESIN
™ Trademark, INEOS or its subsidiaries, registered in various countries

Relevant identified uses of the substance or mixture and uses advised against

Recommended use : RESIN

Details of the supplier of the safety data sheet	**Emergency telephone number**
INEOS Composites US LLC 5220 Blazer Parkway Dublin, OH 43017 United States of America (USA) +1-614-790-9299 (in US) sds.composites@ineos.com	1-800-424-9300 (+1-703-527-3887 for direct dial) **Regulatory Information Number** +1-614-790-9299 (in US), or contact your local customer service representative **Product Information** +1-614-790-9299 (in US)

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids	:	Category 4
Combustible Dust	:	
Acute toxicity (Oral)	:	Category 3
Acute toxicity (Inhalation)	:	Category 3
Skin irritation	:	Category 2
Eye irritation	:	Category 2A
Carcinogenicity (Oral)	:	Category 2
Carcinogenicity (Inhalation)	:	Category 2

Specific target organ toxicity - single exposure : Category 3 (Respiratory system)

Specific target organ toxicity - repeated exposure (Inhalation) : Category 2 (Nasal inner lining)

GHS label elements

Hazard pictograms :

Signal Word : Danger

Hazard Statements : Combustible liquid.
May form combustible dust concentrations in air.
Toxic if swallowed or if inhaled.
Causes skin irritation.
Causes serious eye irritation.
May cause respiratory irritation.
Suspected of causing cancer if swallowed.
Suspected of causing cancer if inhaled.
May cause damage to organs (Nasal inner lining) through prolonged or repeated exposure if inhaled.

Precautionary Statements : **Prevention:**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
Wash skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/ protective clothing/ eye protection/ face protection.

Keep dust/air mixtures away from ignition sources.
Hazardous polymerization can occur under certain conditions. Avoid excessive heat, direct sunlight, peroxides, and other polymerization catalysts. Store in a cool place and maintain proper concentrations of inhibitor and oxygen.

Response:
IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.
IF ON SKIN: Wash with plenty of soap and water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/ attention.
If skin irritation occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage:
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Disposal:
Dispose of contents/ container to an approved waste disposal plant.

Other hazards

Hazardous polymerization may occur.

The following percentage of the mixture consists of ingredient(s) with unknown acute oral toxicity: 75.8687 %

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Classification	Concentration (%)
Furaldehyde	98-01-1	Flam. Liq. 3; H226 Acute Tox. 3; H301	16.8188

		Acute Tox. 2; H330 Acute Tox. 4; H312 Skin Irrit. 2; H315 Eye Irrit. 2A; H319 Carc. 2; H351 STOT SE 3; H335	
FURFURYL ALCOHOL	98-00-0	Flam. Liq. 4; H227 Acute Tox. 3; H301 Acute Tox. 3; H331 Acute Tox. 3; H311 Skin Irrit. 2; H315 Eye Irrit. 2A; H319 Carc. 2; H351 STOT SE 3; H335 STOT RE 2; H373	7.2603

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Symptoms of poisoning may appear several hours later.
Do not leave the victim unattended.

If inhaled : Move to fresh air.
Call a physician or poison control centre immediately.
Keep patient warm and at rest.
If unconscious, place in recovery position and seek medical advice.

In case of skin contact	:	Remove contaminated clothing. If irritation develops, get medical attention. If on skin, rinse well with water. Wash contaminated clothing before re-use. If on clothes, remove clothes.
In case of eye contact	:	Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye.
If swallowed	:	Obtain medical attention. Rinse mouth with water. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed	:	Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea) irritation (nose, throat, airways) Cough bronchitis Headache low body temperature chest pain lung edema (fluid buildup in the lung tissue) Toxic if swallowed or if inhaled. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. Suspected of causing cancer if swallowed. Suspected of causing cancer if inhaled. May cause damage to organs through prolonged or repeated exposure if inhaled.
Notes to physician	:	No hazards which require special first aid measures.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Water spray Foam

		Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	High volume water jet
Specific hazards during firefighting	:	Organic dusts at sufficient concentration can form explosive mixtures in air. If product is heated above its flash point it will produce vapors sufficient to support combustion. Vapors are heavier than air and may travel along the ground and be ignited by heat, pilot lights, other flames and ignition sources at locations near the point of release. Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Carbon dioxide (CO2) Carbon monoxide Hydrocarbons
Specific extinguishing methods	:	Product is compatible with standard fire-fighting agents.
Further information	:	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. Use a water spray to cool fully closed containers.
Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Evacuate personnel to safe areas. Remove all sources of ignition. Use personal protective equipment. Ensure adequate ventilation. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up	:	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.
Other information	:	Comply with all applicable federal, state, and local regulations. Suppress (knock down) gases/vapours/mists with a water spray jet.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	No sparking tools should be used. Keep away from open flames, hot surfaces and sources of ignition. Static ignition hazard can result from handling and use. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Special precautions may be necessary to dissipate static electricity for non-conductive containers. Use proper bonding and grounding during product transfer as described in National Fire Protection Association document NFPA 77.
Advice on safe handling	:	Avoid formation of aerosol. Provide sufficient air exchange and/or exhaust in work rooms. Do not breathe vapours/dust. Do not smoke. Container hazardous when empty. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. Smoking, eating and drinking should be prohibited in the application area. For personal protection see section 8. Dispose of rinse water in accordance with local and national regulations. Secondary operations, such as grinding and sanding, may produce dust. Maintain good housekeeping. Do not permit dust layers to accumulate, for example, on floors, ledges, and equipment, in order to avoid any potential for dust explosion hazards. For further guidance on prevention of dust explosions, refer to National Fire Protection Association (NFPA) 654: "Standard for the Prevention of Fire and Dust Explosions, from the

Manufacturing, Processing and Handling of Combustible Particulate Solids".

Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Observe label precautions.
No smoking.
Prevent unauthorized access.

Further information on storage stability : No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Furaldehyde	98-01-1	TWA	0.2 ppm	ACGIH
		TWA	5 ppm 20 mg/m3	OSHA Z-1
		TWA	2 ppm 8 mg/m3	OSHA P0
		PEL	2 ppm 8 mg/m3	CAL PEL
FURFURYL ALCOHOL	98-00-0	TWA	0.2 ppm	ACGIH
		TWA	10 ppm 40 mg/m3	NIOSH REL
		ST	15 ppm 60 mg/m3	NIOSH REL
		TWA	50 ppm 200 mg/m3	OSHA Z-1
		TWA	10 ppm 40 mg/m3	OSHA P0
		STEL	15 ppm 60 mg/m3	OSHA P0
		PEL	10 ppm 40 mg/m3	CAL PEL
		STEL	15 ppm 60 mg/m3	CAL PEL

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Furaldehyde	98-01-1	Furoic acid	Urine	End of shift (As soon as possible after exposure ceases)	200 mg/l	ZUS_ACGIHB
Remarks:	Nonspecific, With hydrolyses					

Engineering measures : Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.
Provide appropriate exhaust ventilation at places where dust is formed.

Personal protective equipment

Respiratory protection : In the case of vapour formation use a respirator with an approved filter within the capabilities of the respirator/filter combination.
Where concentrations are above recommended limits or are unknown, or a cartridge type respirator is not adequate, wear a positive-pressure supplied-air respirator.

Hand protection
- Material : butyl-rubber
- Break through time : 480 min
- Glove thickness : > 0.5 mm

Remarks : The exact break through time can be obtained from the protective glove producer and this has to be observed. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection : Wear chemical splash goggles when there is the potential for exposure of the eyes to liquid, vapor or mist.

Skin and body protection : Wear resistant gloves (consult your safety equipment supplier).
Wear as appropriate:
Impervious clothing
Safety shoes
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Discard gloves that show tears, pinholes, or signs of wear.

Hygiene measures : Avoid contact with skin, eyes and clothing.
Wash hands before breaks and immediately after handling the product.
When using do not eat or drink.
When using do not smoke.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	:	liquid
Odour	:	aromatic
Odour Threshold	:	No data available
pH	:	6.8
Melting point/freezing point	:	No data available
Boiling point/boiling range	:	324 °F / 162 °C
Flash point	:	82 °C Method: Pensky-Martens closed cup
Evaporation rate	:	No data available
Flammability (solid, gas)	:	May form combustible dust concentrations in air (during processing).
Upper explosion limit	:	19.3 %(V) Calculated Explosive Limit
Lower explosion limit	:	1.8 %(V) Calculated Explosive Limit
Vapour pressure	:	2.946 hPa (25 °C) Calculated Vapor Pressure
Relative vapour density	:	No data available
Relative density	:	No data available
Density	:	1.21 g/cm3 (77.00 °F)

Solubility(ies)

Water solubility	:	No data available
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Thermal decomposition	:	No data available
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Oxidizing properties	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No decomposition if stored and applied as directed.
Chemical stability	:	Stable under recommended storage conditions.
Possibility of hazardous reactions	:	Hazardous polymerisation may occur. Vapours may form explosive mixture with air. This product does not present a dust explosion hazard as delivered. However, fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source, is a potential dust explosion hazard.
Conditions to avoid	:	Heat Exposure to air. Exposure to moisture Exposure to light. Heat, flames and sparks.
Incompatible materials	:	Acids Strong bases Strong oxidizing agents
Hazardous decomposition products		Carbon dioxide (CO2) Carbon monoxide Hydrocarbons

Acetone

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation
Skin contact
Eye Contact
Ingestion

Acute toxicity
Toxic if swallowed or if inhaled.
Product:
Acute inhalation toxicity : Remarks: Symptoms may be delayed.

Components:
Furaldehyde:
Acute oral toxicity : LD50 (Rat): 100 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC50 (Rat): 1.955 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 403

Acute dermal toxicity : Assessment: The component/mixture is classified as acute dermal toxicity, category 4.

FURFURYL ALCOHOL:
Acute oral toxicity : LD50 (Rat): 177 mg/kg

Acute inhalation toxicity : Assessment: The component/mixture is classified as acute inhalation toxicity, category 3.

Acute dermal toxicity : LD50 (Rabbit): 400 - 657 mg/kg

Skin corrosion/irritation
Causes skin irritation.
Product:
Remarks: May cause skin irritation and/or dermatitis., Exposure to sunlight after or during contact with this material may produce a skin reaction. The effect on the skin is similar in appearance to sunburn and is temporary. Repeated or prolonged contact with this material in sunlight may cause more serious skin disorders.

Components:

Furaldehyde:
Species: Rabbit
Method: OECD Test Guideline 404
Result: Irritating to skin.

FURFURYL ALCOHOL:
Result: Irritating to skin.

Serious eye damage/eye irritation
Causes serious eye irritation.
Product:
Remarks: Vapours may cause irritation to the eyes, respiratory system and the skin., Causes serious eye irritation.

Components:
Furaldehyde:
Species: Rabbit
Result: Irritating to eyes.
Method: OECD Test Guideline 405

FURFURYL ALCOHOL:
Result: Irritating to eyes.

Respiratory or skin sensitisation
Skin sensitisation: Not classified based on available information.
Respiratory sensitisation: Not classified based on available information.
Components:
Furaldehyde:
Test Type: Maximisation Test
Species: Guinea pig
Assessment: Did not cause sensitisation on laboratory animals.
Method: OECD Test Guideline 406

Germ cell mutagenicity
Not classified based on available information.
Components:
Furaldehyde:
Genotoxicity in vitro : Test Type: in vitro assay
Result: Positive results were obtained in some in vitro tests.

Genotoxicity in vivo : Test Type: in vivo assay
Result: Positive results were obtained in some in vivo tests.

FURFURYL ALCOHOL:
Genotoxicity in vitro : Test Type: in vitro assay
Result: Positive results were obtained in some in vitro tests.

Genotoxicity in vivo : Test Type: in vivo assay
Result: Positive results were obtained in some in vivo tests.

Carcinogenicity
Suspected of causing cancer if swallowed.
Suspected of causing cancer if inhaled.
Components:
Furaldehyde:
Carcinogenicity - Assessment : Limited evidence of carcinogenicity in animal studies (oral)

FURFURYL ALCOHOL:
Carcinogenicity - Assessment : Limited evidence of carcinogenicity in inhalation studies with animals.

Reproductive toxicity
Not classified based on available information.
STOT - single exposure
May cause respiratory irritation.
Components:
Furaldehyde:
Exposure routes: Inhalation
Target Organs: Respiratory Tract
Assessment: May cause respiratory irritation.

FURFURYL ALCOHOL:
Exposure routes: Inhalation
Target Organs: Respiratory Tract
Assessment: May cause respiratory irritation.

STOT - repeated exposure
May cause damage to organs (Nasal inner lining) through prolonged or repeated exposure if inhaled.
Components:
FURFURYL ALCOHOL:
Exposure routes: Inhalation
Target Organs: Nasal inner lining
Assessment: May cause damage to organs through prolonged or repeated exposure.

Aspiration toxicity
Not classified based on available information.
Further information
Product:
Remarks: No data available

Carcinogenicity:
IARC Group 2B: Possibly carcinogenic to humans

	FURFURYL ALCOHOL	98-00-0

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Ecotoxicology Assessment Short-term (acute) aquatic hazard	:	Not classified based on available information.
Long-term (chronic) aquatic hazard	:	Not classified based on available information.

Components:

Furaldehyde: Toxicity to fish	:	LC50 (Leuciscus idus (Golden orfe)): 29 mg/l Exposure time: 48 h Test Type: static test
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna (Water flea)): 11 mg/l Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 202 Remarks: mortality
Toxicity to fish (Chronic toxicity)	:	NOEC (Danio rerio (zebra fish)): 0.47 mg/l Exposure time: 12 d Test Type: semi-static test
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 1.9 mg/l Exposure time: 21 d Test Type: flow-through test Method: OECD Test Guideline 211
FURFURYL ALCOHOL: Toxicity to fish	:	LC50 (Leuciscus idus (Golden orfe)): 1,356 mg/l

Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 328 mg/l
Exposure time: 24 h
Test Type: static test
Method: OECD Test Guideline 202

Toxicity to algae : EC50: extrapolated 170.3 mg/l
Exposure time: 96 h
Remarks: The value is given based on a SAR/AAR approach using OECD Toolbox, DEREK, VEGA QSAR models (CAESAR models), etc.

Persistence and degradability
Components:
Furaldehyde:
Biodegradability : Result: Readily biodegradable.
Biodegradation: 100 %
Exposure time: 14 d
Method: OECD Test Guideline 301C

FURFURYL ALCOHOL:
Biodegradability : Result: Readily biodegradable.
Method: OECD Test Guideline 301C

No data available
Bioaccumulative potential
Components:
Furaldehyde:
Partition coefficient: n-octanol/water : log Pow: 0.41

FURFURYL ALCOHOL:
Partition coefficient: n-octanol/water : log Pow: 0.28

No data available
Mobility in soil
Components:
No data available
Other adverse effects
No data available
Product:
Additional ecological information : No data available

Components:

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

General advice : Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Dispose of in accordance with all applicable local, state and federal regulations.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Empty containers should be taken to an approved waste handling site for recycling or disposal.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

SECTION 14. TRANSPORT INFORMATION

International transport regulations

REGULATION

ID NUMBER	PROPER SHIPPING NAME	*HAZARD CLASS	SUBSIDIARY HAZARDS	PACKING GROUP	MARINE POLLUTANT / LTD. QTY.

MX_DG

UN	2810	TOXIC LIQUID, ORGANIC, N.O.S. (FURFURAL, FURFURYL ALCOHOL)	6.1	III	

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER

UN	2810	Toxic liquid, organic, n.o.s. (FURFURAL, FURFURYL ALCOHOL)	6.1	III	

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO

UN	2810	Toxic liquid, organic, n.o.s. (FURFURAL, FURFURYL ALCOHOL)	6.1	III

INTERNATIONAL MARITIME DANGEROUS GOODS

UN	2810	TOXIC LIQUID, ORGANIC, N.O.S. (FURFURAL, FURFURYL ALCOHOL)	6.1	III

TDG_INWT_C

UN	2810	TOXIC LIQUID, ORGANIC, N.O.S. (FURFURAL, FURFURYL ALCOHOL)	6.1	III

TDG_RAIL_C

UN	2810	TOXIC LIQUID, ORGANIC, N.O.S. (FURFURAL, FURFURYL ALCOHOL)	6.1	III

TDG_ROAD_C

UN	2810	TOXIC LIQUID, ORGANIC, N.O.S. (FURFURAL, FURFURYL ALCOHOL)	6.1	III

U.S. DOT - INLAND WATERWAYS

UN	2810	Toxic, liquids, organic, n.o.s. (FURFURAL, FURFURYL ALCOHOL)	6.1	III

CFR_RAIL_C

UN	2810	Toxic, liquids, organic, n.o.s. (FURFURAL, FURFURYL ALCOHOL)	6.1	III

U.S. DOT - ROAD

UN	2810	Toxic, liquids, organic, n.o.s. (FURFURAL, FURFURYL ALCOHOL)	6.1	III

***ORM = ORM-D, CBL = COMBUSTIBLE LIQUID**

Marine pollutant		no

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

SECTION 15. REGULATORY INFORMATION

TSCA list
No substances are subject to TSCA 12(b) export notification requirements.

No substances are subject to a Significant New Use Rule.

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Furaldehyde	98-01-1	5000	29728

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
Combustible Dust
Skin corrosion or irritation
Serious eye damage or eye irritation
Specific target organ toxicity (single or repeated exposure)
Acute toxicity (any route of exposure)
Carcinogenicity

SARA 302 : This material does not contain any components with a section 302 EHS TPQ.

SARA 313 This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop. 65

WARNING: This product can expose you to chemicals including furfuryl alcohol, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

The components of this product are reported in the following inventories:

DSL	:	All components of this product are on the Canadian DSL
AICS	:	Not in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	Not in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	On or in compliance with the active portion of the TSCA inventory

Inventories

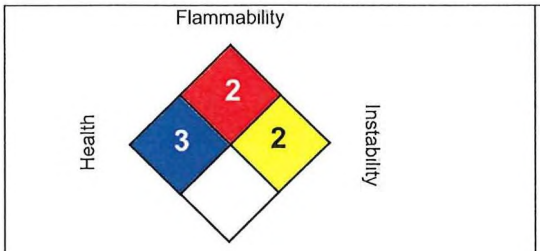
AICS (Australia), AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

SECTION 16. OTHER INFORMATION

Further information

Revision Date: 04/28/2021

NFPA:	HMIS III:



HEALTH	2*
FLAMMABILITY	2
PHYSICAL HAZARD	2

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

NFPA Flammable and Combustible Liquids Classification
Combustible Liquid Class IIIA

Full text of H-Statements

H226	Flammable liquid and vapor.
H227	Combustible liquid.
H301	Toxic if swallowed.
H311	Toxic in contact with skin.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer if swallowed.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.

Sources of key data used to compile the Safety Data Sheet
INEOS internal data including own and sponsored test reports
The UNECE administers regional agreements implementing harmonised classification for labelling (GHS) and transport.

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the

information is current, applicable, and suitable to their circumstances. This SDS has been prepared by INEOS's Environmental Health and Safety Department +1-614-790-9299 (in US).

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Attachment G – Workman's Compensation Insurance Certificate

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 05/05/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Mid-State Insurance Agency, Inc. 1130 Carmack Blvd Columbia, TN 384013742	CONTACT NAME: Richard M Young PHONE (A/C, No, Ext): (931) 388-8332 FAX (A/C, No): E-MAIL ADDRESS: richard@midstateinsurance.com	
	INSURER(S) AFFORDING COVERAGE	NAIC #
	INSURER A : LIBERTY MUTUAL INS. CO.	LMI 10052
INSURED COMPOSITES AND METAL PRODUCTS USA, INC. 1 PENINSULA DR NORTH EAST, MD 21901	INSURER B : CHUBB	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
B	✓ COMMERCIAL GENERAL LIABILITY CLAIMS-MADE ✓ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ✓ POLICY PRO-JECT LOC OTHER:			G47464638-002	05/05/2025	05/05/2026	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 100,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
B	AUTOMOBILE LIABILITY ✓ ANY AUTO OWNED AUTOS ONLY HIRED AUTOS ONLY SCHEDULED AUTOS NON-OWNED AUTOS ONLY			HO8886040-002	05/05/2025	05/05/2026	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
B	✓ UMBRELLA LIAB ✓ OCCUR EXCESS LIAB CLAIMS-MADE DED RETENTION $			G4764651-002	05/05/2025	05/05/2026	EACH OCCURRENCE AGGREGATE	$ 5,000,000 $
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		XWS59551297	05/05/2025	05/05/2026	✓ PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

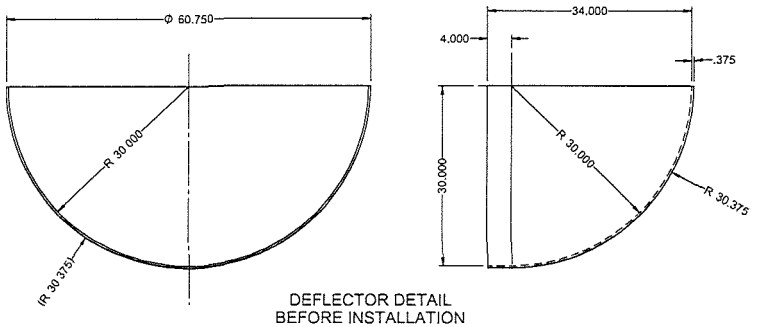
Clorox
1319 Perryman Rd
Aberdeen, MD 21001

CANCELLATION

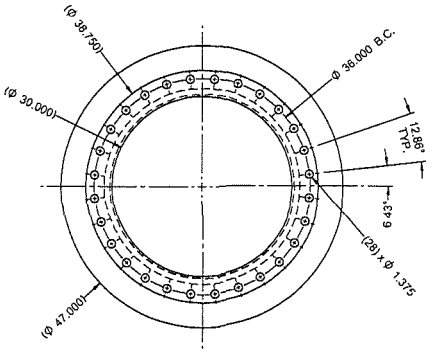
SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

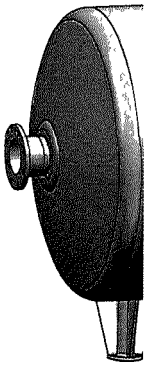
AUTHORIZED REPRESENTATIVE

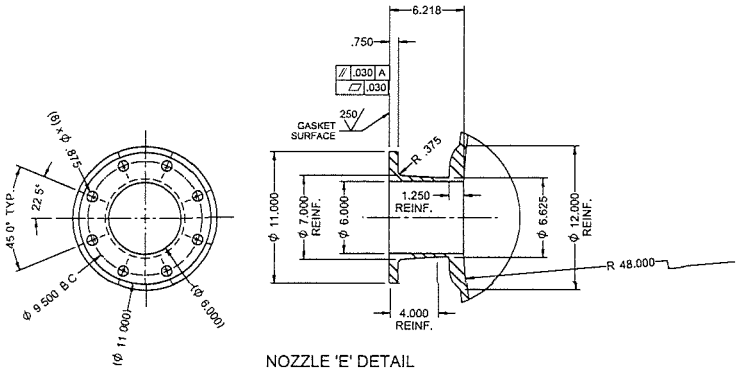
Richard M Young



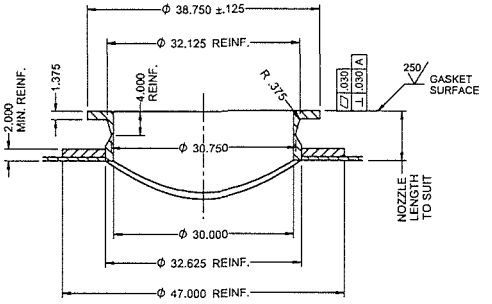
DEFLECTOR DETAIL
BEFORE INSTALLATION







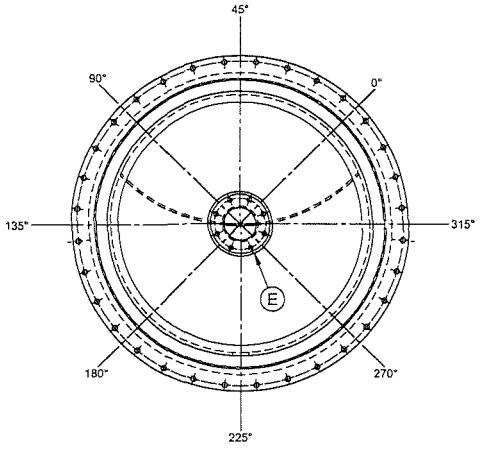
NOZZLE 'E' DETAIL

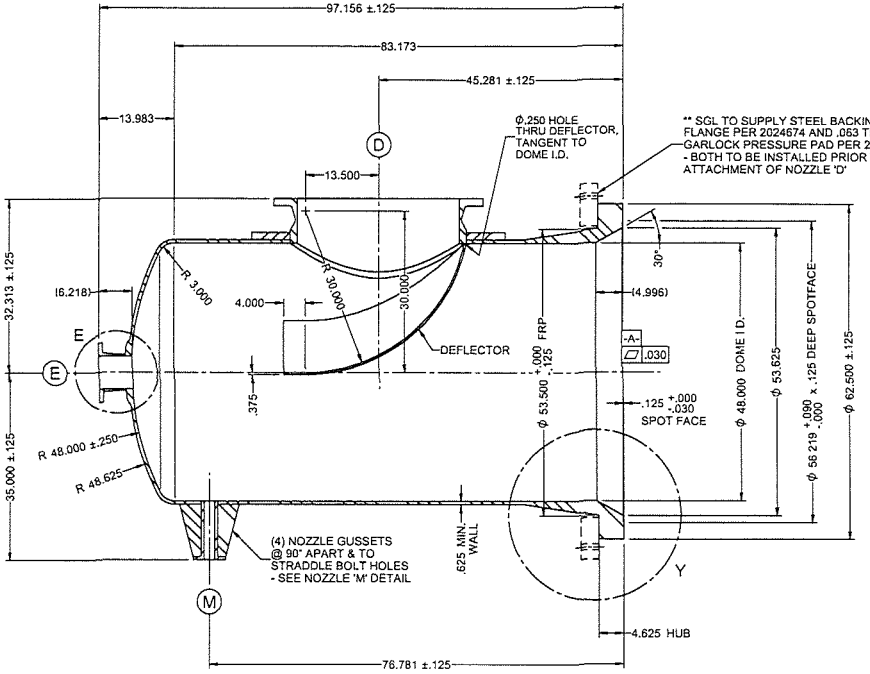


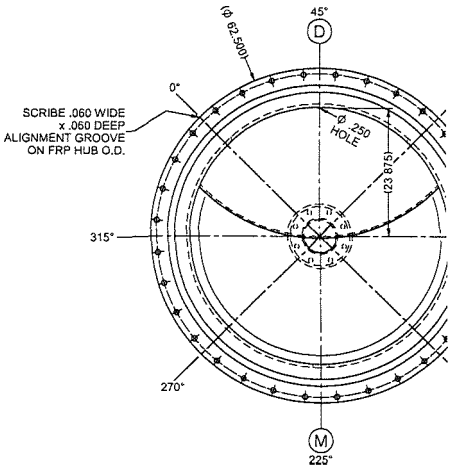
NOZZLE 'D' DETAIL

VENDOR NOTES:

1. FABRICATOR TO CONSTRUCT, TEST AND STAMI
2. DESIGN PRESSURE = 25/FV PSIG @ 150°F DESIC
   FABRICATOR TO HYDROTEST DOME @ 27.5 PSI
   HEADS, SIGNED BY A.I.
2A. THIS DOME WILL ALSO BE SUBJECT TO A 37.5
   OF HEAT EXCHANGER, PER DRAWING 202425
3. SEISMIC DESIGN: ASCE 7-22, RISK CATEGORY II
   WIND DESIGN: ASCE 7-22, , RISK CATEGORY III,
4. MATERIALS: HETRON 980, OR DERAKANE SIGNI/
   SERVICE TO SUIT: 25% HCl, WITH WATER & CO2
5. BREAK ALL SHARP EDGES.
6. ALL FRP FLANGE BOLT HOLES TO STRADDLE CI
7. BOLT CIRCLE TOLERANCE ±.030.
8. SUPPLY SGL WITH DIMENSIONAL DETAIL DRAW
9. SGL TO INSPECT PRIOR TO SHIPMENT - VENDO
10. ESTIMATED FLOATING END BOLT & SPRING LC
11. SGL TO SUPPLY STEEL BACKING FLANGE (202
12. ESTIMATED WEIGHTS:
    FRP DOME: 1155 LBS.
    STEEL BACKING FLANGE = 1375 LBS.

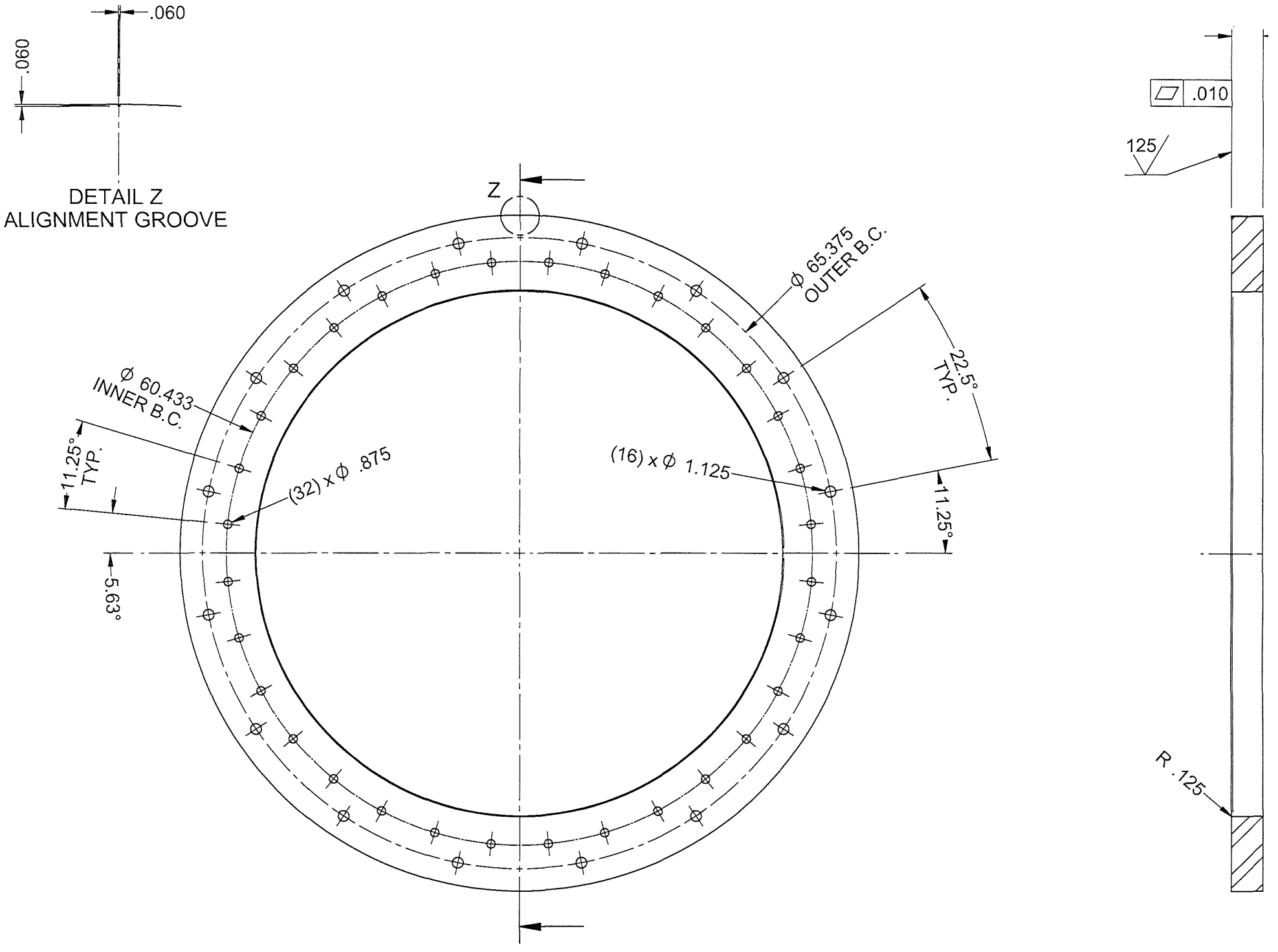






TOP END VIEW
ACTUAL ORIENTATION

Φ 3.000


.060
.060
DETAIL Z
ALIGNMENT GROOVE
Z
.010
125
Ø 65.375
OUTER B.C.
22.5°
TYP.
Ø 60.433
INNER B.C.
11.25°
TYP.
(32) x Ø .875
(16) x Ø 1.125
11.25°
5.63°
R .125

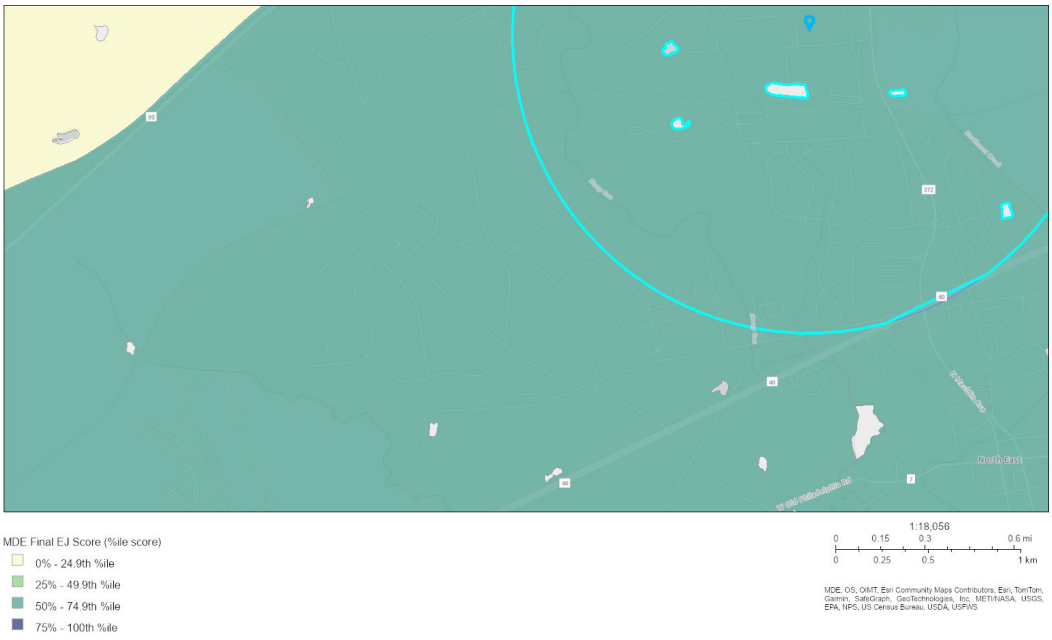
MDE Screening Report - 1 Peninsula Drive, North East, MD 21901

Informations AOI

Surface : 3,14 mi²

janv. 22 2025 14:40:42 heure normale de l'Est

Tabloid ANSI B Landscape



Résumé

Nom	Total	Surface(mi²)	Longueur(mi)
MDE Final EJ Score (%ile score)	3	3,13	N/A
Overburdened Communities Combined Score	3	3,13	N/A
Overburdened Pollution Environmental Score (%ile score)	3	3,14	N/A
Overburdened Exposure Score (%ile score)	3	3,14	N/A
Overburdened Sensitive Population (%ile score)	3	3,14	N/A
Socioeconomic/Demographic Score 2020 (Percentile score) (Underserved Community)	3	3,13	N/A
Air Emissions Facilities	0	N/A	N/A
Sulfur Dioxide (2010)	0	0	N/A
Ozone (2015)	1	3,14	N/A
Fine Particles (2012)	1	3,14	N/A
Biosolids FY 2020 and Current Permit Details	0	N/A	N/A
Biosolids FY2010 - 2014 Permit Details	0	N/A	N/A
Biosolids FY2009 Expired Permit Details	0	N/A	N/A
Biosolids FY 2020 and Current Permits Distribution By Acreage	1	3,14	N/A
Biosolids FY2015 - 2019 Permits Distribution By Acreage	1	3,14	N/A
Biosolids FY2010 - 2014 Permits Distribution By Acreage	1	3,14	N/A
Biosolids FY2009 Permits Expired Distribution By Acreage	1	3,14	N/A
Biosolids FY 2020 and Current Permit Distribution By Percent Coverage	1	3,14	N/A
Biosolids FY2015 - 2019 Permit Distribution By Percent Coverage	1	3,14	N/A
Biosolids FY2010 - 2014 Permit Distribution By Percent Coverage	1	3,14	N/A
Biosolids FY2009 Expired Permit Distribution By Percent Coverage	1	3,14	N/A
Concentrated Animal Feeding Operations (CAFOs)	0	N/A	N/A
Composting Facilities	0	N/A	N/A
Food Scrap Acceptors	0	N/A	N/A
Landfills	0	N/A	N/A
Correctional Facilities	0	N/A	N/A
Industrial Food Suppliers	0	N/A	N/A
Residential Colleges	0	N/A	N/A
Non-Residential Colleges	0	N/A	N/A
Hospitals	0	N/A	N/A
High Schools	0	N/A	N/A
Grocery Stores	1	N/A	N/A
10 Miles from Landfill	3	9,42	N/A
10 Miles from Composting Facility	2	6,28	N/A
General Composting Facilities Tier 2 (MD)	0	N/A	N/A
Commercial Anaerobic Digester (MD)	0	N/A	N/A
Out of State Facilities	0	N/A	N/A
30 mile buffer (Maryland)	1	3,14	N/A
30 Mile Buffer (Out of State)	4	12,56	N/A
Land Restoration Facilities	1	N/A	N/A
Determinations (points)	0	N/A	N/A
Determinations (areas)	0	0	N/A

Entities	1	N/A	N/A
Active Coal Mine Sites	0	N/A	N/A
Historic Mine Facilities	0	N/A	N/A
All Permitted Solid Waste Acceptance Facilities	0	N/A	N/A
Municipal Solid Waste Acceptance Facilities	0	N/A	N/A
Maryland Dam Locations	0	N/A	N/A
Maryland Pond Locations	30	N/A	N/A
Surface Water Intakes	1	N/A	N/A
Wastewater Discharge Facilities	0	N/A	N/A
Drinking Water	0	N/A	N/A
Clean Water	0	N/A	N/A

MDE Final EJ Score (%ile score)

#	Census tract identifier	Geographic Area Name	Total Population	Final EJ Score Percent (for this tract)	Final EJ Score Percentile (Distribution across Maryland)	Surface(mi²)
1	24015030903	Census Tract 309.03, Cecil County, Maryland	5104	32,97	70,20	< 0,01
2	24015030908	Census Tract 309.08, Cecil County, Maryland	5540	29,83	51,95	2,80
3	24015030905	Census Tract 309.05, Cecil County, Maryland	2575	21,53	10,59	0,32

Overburdened Communities Combined Score

#	GEOID20	Geographic_Area_Name	TotalPop	Overburd_Exposure_Percent	Overburd_Exposure_Percentile	Overburd_Poll_Enviro_Percent	Overburd_Poll_Enviro_Percentile	Sensitive_Population_Percent
1	24015030903	Census Tract 309.03, Cecil County, Maryland	5 104	42,70	29,39	8,49	56,87	73,78
2	24015030908	Census Tract 309.08, Cecil County, Maryland	5 540	43,33	32,13	6,73	45,25	77,58
3	24015030905	Census Tract 309.05, Cecil County, Maryland	2 575	38,27	10,12	3,37	20,98	59,30

#	Sensitive_Population_Percentile	OverburdenedAllPercent	OverburdenedAllPercentile	Surface(mi²)
1	81,00	79,63	82,02	< 0,01
2	88,24	69,58	58,78	2,80
3	48,39	21,67	8,41	0,32

Overburdened Pollution Environmental Score (%ile score)

#	GEOID20	Geographic_Area_Name	RentalsOccupiedPre79Percent	Percentile	PercentRMP	PercentRMPEJ	PercentHazWaste	PercentHazWasteEJ
1	24015030903	Census Tract 309.03, Cecil County, Maryland	19,37	74,37	5,09	20,45	2,38	18,42
2	24015030908	Census Tract 309.08, Cecil County, Maryland	3,93	26,18	9,13	17,76	3,44	14,68
3	24015030905	Census Tract 309.05, Cecil County, Maryland	8,69	27,82	4,43	5,09	1,69	4,36

#	PercentSuperFundNPL	PercentSuperFundNPLEJ	PercentHazWW	PercentHazWWEJ	BrownFPercent	Percentile_1	PercentPowerPlants	Percentile_12
1	44,64	39,58	4,96	7,93	0,00	0,00	0,00	0,00
2	37,09	27,32	6,94	7,93	0,00	0,00	0,00	0,00
3	14,53	9,35	0,99	0,99	0,00	0,00	0,00	0,00

#	PercentCAFOS	Percentile_12_13	PercentActiveMines	Percentile_12_13_14	PollutionEnvironmentalPercent	PollnEnvironmentalPercentile	Surface(mi²)
1	0,00	0,00	0,00	0,00	8,49	56,87	< 0,01
2	0,00	0,00	0,00	0,00	6,73	45,25	2,81
3	2,17	95,69	0,00	0,00	3,37	20,98	0,32

Overburdened Exposure Score (%ile score)

#	GEOID20	Geographic_Area_Name	Total_Pop	PercentNATA_Cancer	Percentile_NATA_Cancer	PercentNATA_Resp_HI	Percentile_NATA_Resp_HI	PercentNATA_Diesel
1	24015030903	Census Tract 309.03, Cecil County, Maryland	5 104,00	60,00	32,58	60,00	21,53	18,76
2	24015030908	Census Tract 309.08, Cecil County, Maryland	5 540,00	60,00	22,72	60,00	15,02	23,27
3	24015030905	Census Tract 309.05, Cecil County, Maryland	2 575,00	40,00	3,42	60,00	5,68	20,55

#	Percentile_NATA_Diesel	PercentNATA_PM25	PercentileNATA_PM25	PercentOzone	PercentileOzone	PercentTraffic	PercentileTraffic	PercentTRI
1	15,79	89,56	19,80	93,81	28,74	2,82	19,96	0,00
2	14,49	89,63	13,81	94,23	20,34	3,69	15,86	15,79
3	4,71	90,79	5,76	93,75	7,46	1,07	3,26	0,00

#	PercentileTRI	PercentHazWasteLF	Percentile_HazWasteLF	PollutionExposurePercent	PollutionExposurePercentile	Surface(mi²)
1	0,00	16,67	95,49	42,70	29,39	< 0,01
2	94,87	0,00	0,00	43,33	32,13	2,81
3	0,00	0,00	0,00	38,27	10,12	0,32

Overburdened Sensitive Population (%ile score)

#	GEOID20	Geographic_Area_Name	PerAstma	PercentileAst	PerMyo	PercentileMyo	PerLow	PercentileLow
1	24015030903	Census Tract 309.03, Cecil County, Maryland	63,70	76,14	67,40	77,44	83,90	92,34
2	24015030908	Census Tract 309.08, Cecil County, Maryland	75,55	88,11	77,20	87,35	60,30	82,09
3	24015030905	Census Tract 309.05, Cecil County, Maryland	53,70	38,82	57,60	41,22	34,60	24,47

#	PercentBroad	PercentileBroad	PercentSens	PercentileSens	Surface(mi²)
1	19,86	93,64	58,72	84,89	< 0,01
2	2,73	16,61	53,94	68,54	2,81
3	8,69	29,53	38,65	33,51	0,32

Socioeconomic/Demographic Score 2020 (Percentile score) (Underserved Community)

#	Census tract identifier	Geographic Area Name	Total Population	Percent Poverty	Percent Minority	Percent Limited English Proficiency	Demographic Score (Percent for this tract)	Demographic Score (Percentile Distribution acoss Maryland)	Surface(mi²)
1	24015030903	Census Tract 309.03, Cecil County, Maryland	5 104	42,85	23,12	0,00	21,99	48,59	< 0,01
2	24015030908	Census Tract 309.08, Cecil County, Maryland	5 540	31,42	14,58	0,00	15,33	33,58	2,80
3	24015030905	Census Tract 309.05, Cecil County, Maryland	2 575	12,58	4,82	0,11	5,84	3,98	0,32

Ozone (2015)

#	STATEFP10	COUNTYFP10	COUNTYNS10	GEOID10	NAME10	Ozone NAA Area	8-Hr Ozone (2015) Designation	8-HR Ozone (2015) Classification	8-Hr Ozone (2015) Status	Surface(mi²)
1	24	015	00596115	24015	Cecil	Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE	Nonattainment	Moderate	*No Data*	3,14

Fine Particles (2012)

#	STATEFP10	COUNTYFP10	COUNTYNS10	GEOID10	NAME10	PM2.5 (2012) Status	Surface(mi²)
1	24	015	00596115	24015	Cecil	Attainment/Unclassifiable	3,14

Biosolids FY 2020 and Current Permits Distribution By Acreage

#	County Name	FY2020andAfter	Surface(mi²)
1	Cecil	643,90	3,14

Biosolids FY2015 - 2019 Permits Distribution By Acreage

#	County Name	FY2015to2019	Surface(mi²)
1	Cecil	1 666,50	3,14

Biosolids FY2010 - 2014 Permits Distribution By Acreage

#	County Name	FY2010to2014	Surface(mi²)
1	Cecil	81,70	3,14

Biosolids FY2009 Permits Expired Distribution By Acreage

#	County Name	FY2009	Surface(mi²)
1	Cecil	*No Data*	3,14

Biosolids FY 2020 and Current Permit Distribution By Percent Coverage

#	County Name	FY2020andAfter	Surface(mi²)
1	Cecil	643,90	3,14

Biosolids FY2015 - 2019 Permit Distribution By Percent Coverage

#	County Name	FY2015to2019	Surface(mi²)
1	Cecil	1 666,50	3,14

Biosolids FY2010 - 2014 Permit Distribution By Percent Coverage

#	County Name	FY2010to2014	Surface(mi²)
1	Cecil	81,70	3,14

Biosolids FY2009 Expired Permit Distribution By Percent Coverage

#	County Name	FY2009	Surface(mi²)
1	Cecil	*No Data*	3,14

Grocery Stores

#	County	Name	Address	City	State	Zip	Source	Accpt_SNAP	Total
1	Cecil	Wal Mart 5450	75 N East Plz	North East	MD	21 901,00	SNAP, TRF	Yes	1

10 Miles from Landfill

#	County	Type	Facility_N	ADDRESS	FILL	SITE__ACRE	AI_No_	Owner_Type
1	CECIL	WMF	Cecil Co. Central MunicipalLF	758 East Old Philadelphia Road, Elkton MD 21921.	40	418,00	19 069,00	CTY
2	CECIL	WMF	Cecil Co. Central MunicipalLF-HE	758 East Old Philadelphia Road, Elkton MD 21921.	40	418,00	19 069,00	CTY
3	CECIL	WTS	Woodlawn TransferStation	461 Waibel Road, Port Deposit MD 21904.	-	37,00	37 438,00	CTY

#	MD_GRID__E	PERMITNUMB	EXPIRATION	Surface(mi²)
1	1107 /644	2012-WMF-0532	11/12/2017 7:00 PM	3,14
2	1107 /644	2008-WMF-0629	4/21/2019 8:00 PM	3,14
3	1058 /658	2010-WTS-0074	1/19/2016 7:00 PM	3,14

10 Miles from Composting Facility

#	County	Facility	Address	Accepts_Fo	Location_o	Surface(mi²)
1	*No Data*	Cecil County Central Landfill	758 E Old Philadelphia Rd, Elkton, MD 21921	No	758 E Old Philadelphia Rd, Elkton, MD 21921	3,14
2	*No Data*	West Coast Mushrooms	342 Hopewell Road, Rising Sun, MD 21911	No	342 Hopewell Rd, Rising Sun, MD 21911	3,14

30 mile buffer (Maryland)

#	Facility_Name_1	Facility_Contact_1	Contact_Phone	Contact_Email_1	Contact_2	Contact_2_Phone	Contact_2_Email	URL	Surface(mi²)
1	Veteran Compost - Aberdeen	Justen Garrity	(443) 584-3478	info@veterancompost.com	*No Data*	*No Data*	*No Data*	https://www.veterancompost.com/	3,14

30 Mile Buffer (Out of State)

#	FacilityName	Contact	Surface(mi²)
1	Longwood Gardens	https://files.dep.state.pa.us/Waste/Bureau%20of%20Waste%20Management/WasteMgtPortalFiles/PA_Permitted_Food_Waste_Composting_Facilities.pdf	3,14
2	Ar-Joy Farms	https://files.dep.state.pa.us/Waste/Bureau%20of%20Waste%20Management/WasteMgtPortalFiles/PA_Permitted_Food_Waste_Composting_Facilities.pdf	3,14
3	Cliff Sensenig	https://files.dep.state.pa.us/Waste/Bureau%20of%20Waste%20Management/WasteMgtPortalFiles/PA_Permitted_Food_Waste_Composting_Facilities.pdf	3,14
4	S&A Kreider & Sons Farm, Inc.	https://files.dep.state.pa.us/Waste/Bureau%20of%20Waste%20Management/WasteMgtPortalFiles/PA_Permitted_Food_Waste_Composting_Facilities.pdf	3,14

Land Restoration Facilities

#	Brownfields Master Inventory Number (BMI #). BMI #s are formatted MD####.	Site Name	Other names the site may be known by	Location of Site	City of Site	State of Site	County of Site	Zip code of site	ShapeArea	Total
1	MD0137	Montgomery Brothers Dump	North East Drum Dump; Lakeside Park Development	w/s Inverness Drive	North East	Maryland	Cecil	21901	1,20	1

Entities

#	Brownfields Master Inventory Number (BMI #). This is the site ID number LRP uses to identify sites. BMI #s are formatted MD####.	Site Name	Other names the site may be known by.	Location of Site	City of Site	State of Site	County of Site	Zip code of site
1	MD0137	Montgomery Brothers Dump	North East Drum Dump; Lakeside Park Development	w/s Inverness Drive	North East	Maryland	Cecil	21901

#	Area of site in acres	File Available Electronically. Please note that a PIA request must be completed to review LRP files. In addition, only a portion of a file may be available electroncally.	Provides a link to the fact sheet for the property.	Total
1	1,20	Yes	Fact Sheet Not Available.	1

Maryland Pond Locations

#	Facility Type	DAM HEIGHT	County	HAZARD CLASS	6 DIGIT WATERSHED	8 DIGIT WATERSHED	Total

Surface Water Intakes

#	PDWIS	PWS Name	Population	PWS Type	County	State Assigned Identity Code	Source Name	Type Code
1	MD0070016	TOWN OF NORTH EAST	8 600,00	C	CECIL	IN02	NORTH EAST CREEK	IN

#	Water Plant Number	Emergency Number	Emergency Contact	Total
1	410-287-8102	410-920-1627	Ron Carter	1

American National Standard

ACMA UEF-1-2011a

Estimating Emission Factors from Open Molding and Other Composite Processes

ANSI
American National Standards Institute

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American National Standard for Estimating Emission Factors from Open Molding Composite Processes and Other Composite Processes

Larry B. Cox
Secretariat
American Composites Manufacturers Association

Approved: August 20, 2004
Revisions: May 21, 2010
January 26, 2011
October 05, 2011

American National Standards Institute, Inc.

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American National Standards Institute, Inc., 25 West 43rd Street, New York, NY 10036

Contents

Foreword

(This Foreword is included as background information only. It is not part of the official American National Standard ANSI/ACMA/ICPA UEF-1-2009.)

From 1996 through 1998, the American Composites Manufacturers Association (ACMA), formerly named the Composites Fabricators Association (CFA), conducted styrene emissions testing. The ACMA testing program consisted of three test phases, which investigated the effects of process parameters on the styrene emissions from the open molding of composites. The test protocol used in the ACMA testing is described in the November 18, 1998 ACMA report entitled *Styrene Emissions Test Protocol & Facility Certification Procedures, Revision 2.1.* The results of the ACMA Phase I testing are detailed in the September, 1996 CFA report entitled *Phase I - Baseline Study; Hand Lay-up, Gel Coating, Spray Lay-up including Optimization Study.* The results of the ACMA Phase II and III testing are detailed in the report *Technical Discussion of the Unified Emission Factors for Open Molding of Composites.*

On February 28, 1998, Engineering Environmental Consulting Services (EECS) released a report entitled *CFA Emission Models for the Reinforced Plastics Industries* that details a set of equations developed from the ACMA test data. These equations predicted the styrene emission rates from typical lamination processes employed by the reinforced plastics industry. The report was subsequently posted on the EPA CHIEF website as a possible replacement for the obsolete AP-42 factors for reinforced plastics.

In 1997, the National Marine Manufacturers Association (NMMA) also conducted styrene emission testing using the CFA test protocol. The results of this testing are described in the August 1997 NMMA report entitled *Baseline Characterization of Emissions from Fiberglass Boat Manufacturing*. The NMMA report was also posted on the EPA CHIEF website as part of the AP-42 replacement process.

In November 1998, the CFA and NMMA agreed to merge the data from their respective test programs. The merged data sets were used to develop a new set of equations and factors that unify the methodology employed by boat builders and non-boat builders for estimating the VOC and HAP emissions from the open molding of composite parts. These new emission factors have been named the “Unified Emission Factors” (UEF). The United Emission Factor Table is the base data for this standard.

From 2006 through 2008, emission tests were conducted on machines used to prepare sheet molding compound (SMC), which is used to form composite parts via closed molding in compression and injection presses. In 2008, studies were conducted by Molded Fiberglass Company and Environmental Compliance and Risk Management (ECRM) Inc. to develop a

predictive equation for emissions from SMC machines. The 2009 report *VOC Emissions from Production of Reinforced Composite Sheet Molding Compound* documents those study results and is the basis for the predictive equation in this standard.

Styrene emission testing for SMC Compression Molding was conducted beginning August 11, 2008, ending September 4, 2008 by Engineering Environmental Consulting Services. The test report SMC Compression Molding Test Results was issued November 30, 2008.

Styrene emission testing for BMC and LCM Compression Molding was conducted beginning September 4, 2008, ending September 12, 2008 by Engineering Environmental Consulting Services. The test report BMC/LCM Compression Molding Test Results was issued October 12, 2009,

The test procedures and test methods for this testing were previously described in a test protocol report entitled "*Test Protocol to determine the Process Emissions from Compression Molding using a TTE Enclosure to measure the VOC Emissions from Charge Preparation and Material Handling*" that was submitted to Ohio EPA for comments on July 21, 2008.

This testing and the cited reports serve as the technical basis for the addition of styrene emission factors for compression molding of SMC, BMC, and LCM contained in this standard.

ACMA is the registered trademark of the American Composites Manufacturers Association.

This standard was developed under procedures accredited as meeting the criteria for American National Standards. The list of canvassees that reviewed this proposed standard was balanced to assure that individuals from competent and concerned interests had an opportunity to participate. The standard is available for public input from industry, academia, regulatory agencies and the public-at-large. ACMA does not "approve," "rate" or "endorse" any item or proprietary device described in this standard. Participation by federal /state agency representative(s) or persons associated with industry is not to be interpreted as government or industry endorsement of this standard.

Requests for interpretations or suggestions for revision should be sent to
Larry Cox, American Composites Manufacturers Association,
1010 North Glebe Road, Suite 450, Arlington, Virginia 22201.

1.0 Scope and Purpose

1.1 Scope
The Emission Factors will include emission estimates from open molding and other processes used in the composites industry. It will provide the user with a mechanism to estimate emissions based on the production process, materials being used and techniques employed. The final emission estimates will satisfy state and federal requirements for permit compliance and reporting emissions on Form R.

1.2 Purpose
Manufacturers are required to estimate their air emissions for permitting application and compliance and as may be required by local health officials. Also they must report air emissions from their facilities mandated by the federal Toxic Substance Control Act. Without these sanctioned factors, each facility may be required to conduct cost prohibitive emissions testing to satisfy all these reporting requirements.

2.0 Referenced Standards and Publications
Regulatory Section of : http://www.acmanet.org

40 CFR 63, Subpart WWWW – National Emission Standards for Hazardous Air Pollutants: Reinforced Plastic Composites Production
- Table 1 – The MACT Rule
- Appendix A – Test Method for Determining Vapor-Suppressant Effectiveness

SCAQMD Rule 1162, The Indiana Styrene Rule

3.0 Terms and Definitions

3.1 Terms applicable to Open Molding

3.1.1 Atomized
Atomized spray is any kind of spray application that is not non-atomized spray, but typically includes Conventional Air Atomizing, High Pressure Airless, Air-Assisted Airless, and High Volume Low Pressure applicators.

3.1.2 Controlled Spray
Controlled Spray is a specific set of three work practices that can be used to reduce material usage, worker exposures, and emissions. The three work practices included in a Controlled Spray program are spray gun set-up and pressure calibration, training in proper spray techniques, and mold-perimeter containment flanges. A full program description and training materials for Controlled Spray can be obtained from the technical resources section at *www.acmanet.org*.

3.1.3 Covered Cure
Covered cure means the use of vacuum bagging or other technology where a plastic sheet is use to cover the mold after resin is applied. Covered cure techniques are typically used where higher physical properties of the product are required. Vacuum infusion and other processes where the mold is covered before resin is applied are not considered to be open molding processes.

3.1.4 Filament Application
Filament application is an open molding process for fabricating composites in which reinforcements are fed through a resin bath and wound onto a rotating mandrel. The materials on the mandrel may be rolled out or worked by using manual tools prior to curing. Resin application to the reinforcement on the mandrel by means other than a resin bath, such as spray guns, pressure-fed rollers, flow coaters, or brushes is not considered filament application.

3.1.5 Gel Coat Application

Gel Coat Application is a process where a clear or pigmented formulated resin is applied to the mold by mechanical applicators. The gel coat will become the visible side of the composite part. If the gel coat resin is applied using a manual application method, the resin is no longer considered a gel coat for emission calculations purposes and emissions should be calculated using the manual application factors.

3.1.6 Gel Coat Non-Atomized Application

Mechanical non-atomized application means:

(a) the use of a device for applying gel coat that (1) has been provided by the device manufacturer with documentation showing that use of the device results in HAP emissions that are no greater than the emissions predicted by the applicable non-atomized application equation(s) in Table 1 to Subpart WWWW of Part 63 [the MACT rule]; and (2) is operated according to the manufacturer's directions, including instructions to prevent the operation of the device at excessive spray pressures. Non-atomized application equipment includes flow coaters, flow choppers, low tip pressure spray applicators, and pressure-fed rollers.

(b) any spray application that meets the non-atomized definition in SCAQMD Rule 1162, the Indiana Styrene rule, or the US EPA MACT rule. Non-atomized spray includes both an equipment design requirement and certain essential work practice requirements. The gun supplier and the applicable regulations specify the required work practices.

3.1.7 Gel Coat Lesser Atomized Application (LAGA)

The atomized gel coat factor has been found to over predict gel coat emissions, while the non-atomized gel coat factor has been shown to under predict gel coat emissions. LAGA equipment is designed to apply gel coat to an open mold with less atomization of the spray plume than older equipment designs, which results in lower styrene emissions from the gel coat.

3.1.8 Manual

Manual (application) is any non-mechanical application (without pumps or pressurized material flow), and includes bucket-and-brush and bucket-and-roller.

3.1.9 Mechanical

Mechanical (application) means the use of pumps to deliver a pressurized stream of resin or gel coat to a mold through some kind of application device. Spray and non-spray are the two types of mechanical application.

3.1.10 Mechanical Atomized

Mechanical Atomized (application) means application of resin or gel coat with spray equipment that separates the liquid into a fine mist. This fine mist may be created by forcing the liquid under high pressure through an elliptical orifice, bombarding a liquid stream with directed air jets, or a combination of these techniques.

3.1.11 Mechanical Atomized Control Spray

Mechanical Atomized Control Spray is the use of an atomized spray gun in combination with a Controlled Spray program.

3.1.12 Mechanical non-atomized

Mechanical non-atomized (application) means (a) or (b):

(a) the use of a device for applying resin that a) has been provided by the device manufacturer with documentation showing that use of the device results in HAP emissions that are no greater than the emissions predicted by the applicable non-atomized application equation(s) in Table 1 to Subpart WWWW of Part 63 [the MACT rule]; and b) is operated according to the manufacturer's directions, including instructions to prevent the operation of the device at excessive spray pressures. Non-atomized application equipment includes flow coaters, flow choppers, low tip pressure spray applicators, and pressure-fed rollers.

(b) any spray application that meets the non-atomized definition in SCAQMD Rule 1162, the Indiana Styrene rule, or the US EPA MACT rule. Non-atomized spray includes both an equipment design requirement and certain essential work practice requirements. The gun supplier and the applicable regulations specify the required work practices.

3.1.13 Open Molding
Open molding is manual resin application, mechanical resin application, filament winding, and gel coat application. Resin Transfer molding (or other processes where resin is delivered in a closed or covered mold, pultrusion and compression molding are not open molding processes.

3.1.14 Roll-Out
Roll-out is the process used to compact and remove entrapped air from a laminate after the resin and reinforcement has been applied to a mold.

3.1.15 Spray
Spray means any material flow moving through the air to be deposited on a mold. Spray can be atomized or non-atomized.

3.1.16 Styrene Content
The styrene content of a resin or gel coat is the styrene content as applied, including any styrene added by the user. For non-gel coat resins the styrene content is calculated before any fillers or other non-styrene materials are added.

3.1.17 Vapor Suppressant
Vapor suppressant is an additive, typically a wax that migrates to the surface of the resin during curing and forms a barrier to seal in the styrene and reduce styrene emissions.

3.1.18 Vapor Suppressed Resin, VSR
VSR is a resin containing a vapor suppressant added for the purpose of reducing styrene emissions during curing**.**

3.1.19 Vapor Suppressed Resin Reduction Factor
The VSR Reduction Factor is a measure of the efficiency of a suppressant with a resin. It is determined by testing each resin/suppressant formulation according to the test method found in The US EPA MACT rule, Appendix A to Subpart WWWW--Test M.

3.2 Compression Molding Material Definitions

3.2.1 Sheet Molding Compound (SMC) is the feedstock used to produce reinforced plastic composite parts in injection and compression presses. SMC consists of styrenated resin paste and fiber reinforcement, sandwiched between two nylon-containing carrier films.

3.2.2 Bulk Molding Compound (BMC) is a feedstock used to produce reinforced plastic composite parts in injection and compression presses. BMC is a premixed blend of styrenated resin, reinforcements, initiators and fillers.

3.2.3 Liquid Composite Molding (LCM) is a term referring to the combination of a fiber reinforcement and a styrenated resin paste in a closed mold to produce reinforced plastic composite parts. Liquid resin is applied to the reinforcement before molding. The resin may be applied from a container or conveyance so that it covers typically 10-40% of the area of the reinforcement (poured), or it may be applied and then spread to increase the coverage to in excess of 50% of the area of the reinforcement (spread). .

3.3 Terms applicable to Production of Sheet Molding Compound

3.3.1 Doctor Boxes are the upper and lower reservoirs into which resin paste mixed upstream is introduced and spread in a thin film across nylon carrier film.

3.3.2 Lower Wet Length (L_l) is the distance in feet, measured along the path of lower film travel, between the downstream end of the lower doctor box and the point at which the upper and lower carrier films come together.

3.3.3 SMC Machine refers to the production line for SMC. In typical configurations, resin paste is pumped to upper and lower reservoirs (*doctor boxes*), from which it is distributed in a thin layer across upper and lower carrier films, which are impervious to styrene. Chopped fibers (usually glass) are spread across the lower carrier film, and the two films are brought together and fed through a series of compression rollers, after which the final product is either rolled or folded (festooned) for storage.

3.3.4 Total Wet Area (A_t) is calculated as defined in section 4.

3.3.5 Upper and Lower Open Doctor Box Areas (A_{du} and A_{dl}) are the areas of each doctor box that are uncovered, measured in square feet.

3.3.6 Upper Wet Length (L_u) is the distance in feet, measured along the path of upper film travel and including vertical sections, between the downstream end of the upper doctor box and the point at which the upper and lower carrier films come together.

3.3.7 Wet Width (W) is the width in feet of the layer of resin paste deposited under the doctor box as carrier film moves below it.

4.0 Instructions and Examples for the Emission Factor Table

A simple tabular format has been developed to encapsulate the new Emission Factor information on one sheet of paper. This tabular format is called the “EF Table 1.”

This section contains instructions for using EF Table 1 to find the proper emission factor for a specific resin or gel coat material and application process.

4.1 How to find the proper open molding emission factor using EF Table 1

4.1.1 Before using EF Table 1, the following information must be obtained:

4.1.1.1 Styrene content of the resin/gel coat material

The styrene content of the resin/gel coat materials can be obtained from the associated MSDS information, the Q/A certification sheet sent with most bulk resin shipments, or by calling the resin supplier or manufacturer. Occasionally, the MSDS will specify a broad range for the styrene content, such as 20 to 50% styrene by weight. This is a short-cut used by the resin supplier to avoid listing more specific information for each resin formulation. The average value for such a broad range (average 35% for the example above) should not be used. Instead, the resin supplier should be asked to provide more precise estimates of the actual monomer contents for each material.

4.1.1.2 Application process used to apply the material

The correct application process must be identified from the following major types; Manual, Mechanical Atomized, Mechanical Non-Atomized, Filament, or Gel coat Spraying.

4.1.1.3 Vapor-suppressant data - the VSR reduction factor (if used)

Determine if vapor suppressant is added to the resin formulation. If so, the VSR reduction factor for that specific resin/suppressant mixture must be obtained from the resin supplier, or must be determined at the plant according to procedures detailed in the Vapor Suppressant Effectiveness Test (this test protocol can be found in Appendix A to Subpart WWWW – Test Method for Determining Vapor Suppressant Effectiveness, Federal Register Volume 68, No. 76.

4.1.1.4 Special pollution prevention techniques (if used)

Determine if Controlled Spraying and/or Covered-Cure are used with any of the application processes.

4.1.2 With this information refer to EF Table 1.

4.1.2.1

Find the correct application process in the left-most column of EF Table 1.

4.1.2.2

Find the correct styrene content across the top row of EF Table 1.

4.1.2.3

Locate the cell at the intersection of the selected row and column. This cell contains the correct emission factor that corresponds to the application process and styrene content resin or gel coat selected. If the styrene content is below 33 percent, use the equation in the left-most column to compute emission factors. If the styrene content is above 50 percent, use the equation on the far right column to compute emission factors. For both equations the styrene content value should be expressed as a decimal fraction, i.e. where the equation calls for “52%” use “0.52”.

4.1.2.4

(For vapor-suppressed resins) If a vapor suppressed resin is used, first determine the factor as if the resin was non-suppressed. Then the VSR reduction factor for the specific resin/suppressant mixture and the corresponding non-vapor suppressed emission factor are inserted into the equation in EF Table 1.

4.1.2.5

(For non-suppressed resins that use the covered-cure technique) The appropriate covered-cure factor depends on whether the covering is placed after the wet laminate is rolled out or whether the covering is applied directly to the wet laminate without any rolling taking place. The covered cure factor is multiplied by the corresponding non-vapor suppressed resin application process emission factor as shown in EF Table 1. Vapor suppressants are not used in conjunction with covered-cure because the impervious cover takes the place of the film formed by the suppressant.

4.2 Calculation of the methyl styrene factor

4.2.1 This methyl styrene factor will be equal to 55% of the equivalent UEF non-atomized resin application factor. The following is an example calculation that shows how the methyl styrene factor will be determined:

4.2.1.1

UEF styrene emission factor for 5% styrene content = 10.7% of styrene weight

4.2.1.2

Methyl styrene emission factor for 5% methyl styrene content resin=
55% x 10.7% = 5.89% of methyl styrene weight

5. Estimation of VOC Emissions from Production of SMC

SMC machine emissions of volatile organic compounds (VOC) can be estimated from the following equation:

E = 0.1457 At - 0.1454

where:
E = VOC emission rate, lb/hr, when paste is on the line
At = Total wet area of SMC machine = Adl + Adu + W*(Ll+Lu)
Adl = open area of the lower doctor box, ft2
Adu = open area of the upper doctor box, ft2
W = wet width of SMC, ft
Ll = Lower wet length, ft
Lu = Upper wet length, ft

6.0 Estimation of VOC Emissions from Compression Molding of SMC

The emission factor for SMC is expressed as a percentage of the available styrene monomer contained in the uncured SMC material that is processed in the compression mold. The emission factor for SMC part compression molding is:

1.5% of the styrene monomer content (weight) in the SMC material

7.0 Estimation of VOC Emissions from Compression Molding of BMC

The emission factor for BMC is expressed as a percentage of the available styrene monomer contained in the uncured BMC material that is processed in the compression mold. The emission factor for BMC part compression molding is:

1.15% of the styrene monomer content (weight) in the processed BMC material

8.0 Estimation of VOC emissions from Compression Molding of LCM

The emission factor for LCM part compression molding consists of two separate equations. The first equation is for the spread of LCM paste, the second equation is for poured LCM paste.

- LCM spread paste factor (% of paste weight) = .0072 x % styrene + 0.0008
- LCM poured paste factor (% of paste weight) = .0022 x % styrene + 0.0008

NOTE: The "% styrene" input value in these equations must be in decimal form instead of percentage (0.20 instead of 20%). These equations generate the factor as a decimal fraction of the processed paste weight..

9.0 Emissions factors for the cast polymer open molding manufacturing process

Gel coat emissions factors are derived from the UEF Table 1 and apply to the various forms of gel coat application listed.

Emissions from the matrix casting (pouring) process are listed in *AP-42 - Table 4.4-2 Emissions Factors for Uncontrolled Polyester Resin Production Processes* and are described as Marble Casting 30800766 – Polymer Casting (Cultured Marble or Marble Casting).

EF Table 1: Unified Emission Factors for Open Molding of Composites

Revised and Approved: 10/13/2009

Emission Rate in Pounds of Styrene Emitted per Ton of Resin or Gelcoat Processed

Styrene content in resin/gelcoat, % [1]	<33 [2]	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	>50 [2]
Manual	0.126 x %styrene x 2000	83	89	94	100	106	112	117	123	129	134	140	146	152	157	163	169	174	180	((0.286 x %styrene) - 0.0529) x 2000
Manual w/ Vapor Suppressed Resin VSR [3]	Manual emission factor [listed above] x (1 - (0.50 x specific VSR reduction factor for each resin/suppressant formulation))																			
Mechanical Atomized	0.169 x %styrene x 2000	111	126	140	154	168	183	197	211	225	240	254	268	283	297	311	325	340	354	((0.714 x %styrene) - 0.18) x 2000
Mechanical Atomized with VSR [3]	Mechanical Atomized emission factor [listed above] x (1 - (0.45 x specific VSR reduction factor for each resin/suppressant formulation))																			
Mechanical Atomized Controlled Spray [4]	0.130 x %styrene x 2000	86	97	108	119	130	141	152	163	174	185	196	207	218	229	240	251	262	273	0.77 x ((0.714 x %styrene) - 0.18) x 2000
Mechanical Controlled Spray with VSR	Mechanical Atomized Controlled Spray emission factor [listed above] x (1 - (0.45 x specific VSR reduction factor for each resin/suppressant formulation))																			
Mechanical Non-Atomized	0.107 x %styrene x 2000	71	74	77	80	83	86	89	93	96	99	102	105	108	111	115	118	121	124	((0.157 x %styrene) - 0.0165) x 2000
Mechanical Non-Atomized with VSR [3]	Mechanical Non-Atomized emission factor [listed above] x (1 - (0.45 x specific VSR reduction factor for each resin/suppressant formulation))																			
Mechanical Non-Atomized application of resins that contain Methyl Styrene monomer [10]	Mechanical Non-Atomized Styrene monomer emission Factor (listed above) x .55																			
Mechanical Non-Atomized Filled DCPD resins (11)	0.144 x % styrene x 2000	95	98	101	104	108	111	114	117	120	124	127	130	133	136	140	143	146	149	((0.1603 x % styrene)-0.0055) x 2000
Filament application	0.184 x %styrene x 2000	122	127	133	138	144	149	155	160	166	171	177	182	188	193	199	204	210	215	((0.2746 x %styrene) - 0.0298) x 2000
Filament application with VSR [3]	0.120 x %styrene x 2000	79	83	86	90	93	97	100	104	108	111	115	118	122	125	129	133	136	140	0.65 x ((0.2746 x %styrene) - 0.0298) x 2000
Gelcoat Application	0.445 x %styrene x 2000	294	315	336	356	377	398	418	439	460	481	501	522	543	564	584	605	626	646	((1.03646 x %styrene) - 0.195) x 2000
Gelcoat Controlled Spray Application [4]	0.325 x %styrene x 2000	215	230	245	260	275	290	305	321	336	351	366	381	396	411	427	442	457	472	0.73 x ((1.03646 x %styrene) - 0.195) x 2000
Gelcoat Non-Atomized Application [8]	SEE Note 9 below	196	205	214	223	232	241	250	259	268	278	287	296	305	314	323	332	341	350	((0.4506 x %styrene) - 0.0505) x 2000
Lesser Atomized Gelcoat Application [12]	for < 30 : 0.323 x % styrene x 2000	229	241	252	264	276	287	299	311	322	334	346	357	369	381	392	404	416	428	((0.5842 x % styrene)-0.07825) x 2000
Covered-Cure after Roll-Out	Non-VSR process emission factor [listed above] x (0.80 for Manual <or> 0.85 for Mechanical)																			
Covered-Cure without Roll-Out	Non-VSR process emission factor [listed above] x (0.50 for Manual <or> 0.55 for Mechanical)																			

Emission Rate in Pounds of Methyl Methacrylate Emitted per Ton of Gelcoat Processed

MMA content in gelcoat, % [5]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	≥20
Gel coat application [7]	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	0.75 x %MMA x 2000

Notes

1 Including styrene monomer content as supplied, plus any extra styrene monomer added by the molder, but before addition of other additives such as powders, fillers, glass,...etc.

2 Formulas for materials with styrene content < 33% are based on the emission rate at 33% (constant emission factor expressed as percent of available styrene), and for styrene content > 50% on the emission rate based on the extrapolated factor equations; these are not based on test data but are believed to be conservative estimates. The value for "% styrene" in the formulas should be input as a fraction. For example, use the input value 0.30 for a resin with 30% styrene content by wt.

3 The VSR reduction factor is determined by testing each resin/suppressant formulation according to the procedures detailed in the ***CFA Vapor Suppressant Effectiveness Test.***

4 SEE the ***CFA Controlled Spray Handbook*** for a detailed description of the controlled spray procedures.

5 The effect of vapor suppressants on emissions from filament winding operations is based on the ***Dow Filament Winding Emissions Study.***

6 Including MMA monomer content as supplied, plus any extra MMA monomer added by the molder, but before addition of other additives such as powders, fillers, glass,...etc.

7 Based on gelcoat data from ***NMMA Emission Study.***

8 SEE the July 17, 2001 EECS report ***Emission Factors for Non-Atomized Application of Gel Coats used in the Open Molding of Composites*** for a detailed description of the non-atomized gelcoat testing.

9 Use the equation **((0.4506 x %styrene) - 0.0505) x 2000** for gelcoats with styrene contents between 19% and 32% by wt.; use the equation **0.185 x %styrene x 2000** for gelcoats with less than 19% styrene content by wt.

10 Refer to Section 3.0, Instructions and Examples for the Emission Factor table, 3.2 Calculation of the methyl styrene factor

11 Use this factor for the non-atomized application of DCPD or DCPD-blend resin, when filled to 30% or more by weight

12

Table from 30% TO 32% styrene content :	30	31	32
	194	206	217

Guidelines for Calculating Emissions from Polyester Resin Operations

(December 2019)

The purpose of this document is to provide operators with guidelines in estimating volatile organic compound (VOC) emissions from the use of materials in polyester resin operations subject to District Rule 1162. The methodologies used in this document are consistent with 40 CFR Part 63, subpart WWWW.

Starting with Fiscal Year 1999-2000, operators of polyester resin operations that are subject to Rule 1162 must use the methodologies in this guideline for calculating and reporting VOC emissions in the District Annual Emissions Reporting (AER) Program. In addition to the definition of terms in Rule 1162, the first section of this document describes the types of polyester resin operations that may be encountered. The next two sections discuss the air emissions associated with polyester resin operations and the use of emission factors and equations. The last section provides instructions and examples of how VOC emissions are calculated and reported in the AER.

DESCRIPTION OF OPERATIONS

Atomized Mechanical Application means application of resin or gel coat with spray equipment that separates the liquid into a fine mist. This fine mist may be created by forcing the liquid under high pressure through an elliptical orifice, bombarding a liquid stream with directed air jets, or a combination of these techniques. This process allows for a greater production rate and more uniform parts than hand lay-up.

Closed Molding means a grouping of processes for fabricating composites in a way that VOC containing materials are not exposed to the atmosphere except during the material loading stage. Processes where the mold is covered with plastic prior to resin application, and the resin is injected into the covered mold are also considered closed molding.

Compression Molding means a closed molding process for fabricating composites in which composite materials are places inside matched dies that are used to cure the materials under heat and pressure without exposure to the atmosphere.

Covered-Cure refers to an impervious film or barrier that is applied to the wet surface of the mold just after the application of the resin. This barrier may be applied immediately after roll-out phase, or just after the application phase without any subsequent roll-out.

Filament Application means an open molding process for fabricating composites in which reinforcements are fed through a resin bath and wound onto a rotating mandrel. The materials on the mandrel may be rolled out or worked by using non-mechanical tools prior to curing. Resin application to the reinforcement on the mandrel by means other than the resin bath, such as spray guns, pressure-fed rollers, flow coaters, or brushes are not considered filament application.

Fluid Impingement Technology means a spray gun that produces an expanding non-misting curtain of liquid by the impingement of low-pressure uninterrupted liquid stream.

Gel Coat is a specialized polyester quick-setting resin that is formulated to provide a cosmetic outer surface and to improve performance of the composite products. The "solvent" in gel coat is styrene monomer and/or methyl methacrylate (acrylic–MMA) which cross-links during curing.

Hand Lay-Up is the simplest fabrication in open mold process. Hand lay-up is a manual application technique of composite materials using a bucket and a brush or a roller, or other hand held method of application. Hand lay-up uses no mechanical spraying or chopping equipment for depositing the resin or glass reinforcement. The process continues until the desired thickness is achieved. The use of pressure-fed rollers and flow coaters to apply resin is not considered manual resin application.

Injection Molding means a closed molding process for fabricating composites in which composite materials are injected under pressure into a heated mold cavity that represents the exact shape of the product. The composite materials are cured in the heated mold cavity.

Methyl Methacrylate (MMA) is sometimes present as a secondary monomer added to the gel coat formulation to increase the UV-resistance, to improve the surface finish, and to impart greater toughness. The greater vapor pressure of MMA makes it much more volatile than styrene. Its emissions must be estimated separately from styrene emissions.

Non-Atomized Mechanical Application means the use of application tools other than buckets and brushes to apply resin and gel coat. Examples of non-atomized application include flow coaters, pressure-fed rollers, and fluid impingement spray guns.

Open Molding is a method of fabricating composite parts by applying gel coats, resins, fibers, and other composites materials on an open mold using either hand lay-up or spray-up applications.

Polymer (Marble) Casting means a process for fabricating composites in which composite materials are ejected from a casting machine or poured into an open, partially open, or closed mold and cured. After the composite materials are poured into the mold, they are not rolled out or worked while the mold is open, except for smoothing the material and/or vibrating the mold to remove bubbles.

Pultrusion means a continuous process for manufacturing composites that have a uniform cross-sectional shape. The process consists of pulling a fiber-reinforcing material through a resin impregnation chamber or bath and through a shaping die, where the resin is subsequently cured.

Robotic/Automated Spray means application of resin or gel coat with atomized mechanical equipment in a controlled setting either robotically and/or automatically.

Tooling resin means a resin that is used to produce molds. Tool resins generally have high heat distortion temperatures, low shrinkage, high hardness, and high dimensional stability.

Vapor Suppressant (VS) means an additive, typically a wax, which migrates to the surface of the resin during curing and forms a barrier to seal in the styrene and reduce styrene emissions.

Vapor Suppressed Efficiency (VSE) means the percent reduction of styrene emissions from the use of a resin containing a vapor suppressant added for the purpose of reducing styrene emissions during curing.

VOC EMISSIONS

VOC emissions from polyester resin operations occur when the cross-linking agent (monomer) contained in the liquid resin evaporated from fresh resin surfaces into air during application curing.

VOC emissions also come from the use of solvents for clean-up of hands, tools, molds, and application equipment. Styrene and methyl methacrylate are by far the principle and the most common monomers used in cross linking agents.

Since emissions result from evaporation of monomer from the uncured resin, they depend upon the amount of resin surface exposed to the air and the duration of exposure. Thus the potential for emissions varies with the manner in which the resin is mixed, applied, handled, and cured among the different fabrication processes. For example, the spray lay-up operation has highest potential for VOC emissions because the atomization of resin into spray creates an extremely large surface area from which volatile monomer can evaporate. In contrast, the emission potential in synthetic marble casting and closed molding operations is considerably lower, because of the lower monomer content in the casting resins and of the enclosed nature of the moldings.

VOC emissions from polyester resin operations can be reduced by the implementing the following:

- Switch to low VOC emitting application method;
- Improve resin transfer efficiency;
- Reduce styrene content in resin or use catalyzed resin;
- Use vapor suppressed resins; or
- Use add-on controls.

EMISSION FACTORS

The emissions from the polyester resin operations can be calculated using the factors provided in the attached tables and the following equation.

Emission = Throughput x Emission Factor *Equation 1*

The unit for annual throughput must be consistent with the unit of emission factor. For styrene and MMA emissions from polyester resin operations, the emission factors are determined using styrene and/or MMA contents in the resins and equations in Tables 2 or 3. Operators are encouraged to calculate emissions from the process using specific parameters that are applicable to its operations. ***Supporting documents must be submitted with the annual emission report to show the use of such parameters in calculating annual emissions.***

In addition to emissions from the monomers (styrene and/or MMA), emissions from other VOC solvents, commonly MEK, in the resin must also be calculated separately and combined with emissions from styrene and/or MMA. This calculation is illustrated in the examples section.

VOC emissions from polyester resin operations can be calculated using equation 1 with one of the following methods:

Method 1: Default Emission Factor

For simplicity, default emission factors for the common operations are provided in Emission Factors Tables of AER Help and Support Manual and Table 1 below. These default emission factors have already incorporated the emissions from styrene, MEK, and MMA. This means operators don't have

to separately calculate the emissions from these materials. The default factors are developed using the average parameters applicable to conditions in the South Coast Air Basin.

Method 2: Specific Emission Factor

Alternatively, an operator can calculate VOC emissions from polyester resin operations using the specific styrene content with the equations listed in Tables 2 or 3 for the applicable emission factors in conjunction with the following restrictions:

1. For monomer (styrene and/or MMA) content, use information provided by the manufacturer, such as manufacturer's formulation data or material safety data sheet (MSDS), which must be included with the annual report as supporting documentation.
2. Monomer content should be entered as a fraction for equations in Table 2. For example, 35% should be entered as 0.35.
3. If the monomer contents are provided as a range, use the upper limit of the range for emissions calculation and compliance demonstration.
4. If the single value monomer content falls between the percentages in Table 3, the value of emission factor can be linearly extrapolated between the whole percents.
5. Include monomer content as supplied, plus any extra styrene monomer added, but before addition of other additives such as powders, fillers, glass, etc.
6. A default VSE of 0.50 (50%) is allowed and incorporated in the values in Table 3. For VSE of greater than 50%, the VSE must be ***officially certified in writing*** and must be submitted with the annual report to support the presence of VS and its VSE. **Note: Do not confuse vapor suppressed efficiency with add-on control efficiency. The VSE is imbedded into the emission factor for emission calculation; whereas, add-on control efficiency is for calculating emissions after further control by additional control equipment.**

INSTRUCTIONS AND EXAMPLES FOR CALCULATING AND REPORTING VOC EMISSIONS FROM POLYESTER RESIN OPERATIONS

This section contains instructions for calculating VOC emissions from polyester resin operations using the emission factors or emission factor equations. The resulted emission factors should be entered in proper places in the AER Reporting Tool. One set of data will be used in three examples to illustrate the levels of involvement and accuracy of VOC emissions.

ANNUAL DATA:

- The resin contains 33% - 36% styrene with vapor suppressant (VS) certified to be 65% efficient (VSE = 0.65). The MSDS also shows 1.5% MEK as solvent.
- The gel coat contains 41% styrene and 3% methyl methacrylate (MMA).
- 650,000 pounds of resin and 85,000 pounds of gel coat materials were used in making the products in the following areas:
  a) Manual Lay-up Resin = 450,000 lbs
  b) Mechanical Non-Atomized Spray Resin = 200,000 lbs

c) Gel Coat Non-Atomized Spray = 25,000 lbs

d) Gel Coat Atomized Spray = 60,000 lbs

Example 1 – Use of Default Factors: Facility A does not have complete supporting documents for detailed calculations, and calculates and reports VOC emissions using default factors as follows:

a) Manual Lay-up Resin = 450,000 lbs * 0.067 lb/lb = 30,150 lbs VOC

Throughput = 450,000 lbs ***Emission Factor = 0.067 lb/lb***

b) Mechanical Non-Atomized Spray Resin = 200,000 lbs * 0.05 lb/lb = 10,000 lbs VOC

Throughput = 200,000 lbs ***Emission Factor = 0.05 lb/lb***

c) Non-Atomized Spray Gel Coat = 25,000 lbs * 0.36 lb/lb = 9,000 lbs VOC

Throughput = 25,000 lbs ***Emission Factor = 0.36 lb/lb***

d) Atomized Spray Gel Coat = 60,000 lbs * 0.36 lb/lb = 21,600 lbs VOC

Throughput = 60,000 lbs ***Emission Factor = 0.36 lb/lb***

Total VOC emissions = 70,750 lbs or 35.38 tons VOC

Example 2 – Use of Emission Factors in Table 3: Facility B has MSDS for VS resin and gel coat. Facility cannot obtain VSE certification. The operator calculates and reports VOC emissions using Table 3 values, which include the default VSE of 50%, as follows:

a) Manual Lay-up VS Resin with 36% styrene, the emission factor is 0.038 lb/lb for styrene and 0.015 lb/lb for MEK

Emissions = 450,000 lbs * (0.038 lb/lb + 0.015 lb/lb) = 23,850 lbs VOC

Throughput = 450,000 lbs ***Emission Factor = 0.053 lb/lb***

b) Mechanical Non-Atomized Spray VS Resin, the emission factor is 0.031 lb/lb for styrene and 0.015 lb/lb for MEK

Emissions = 200,000 lbs * (0.031 lb/lb + 0.015 lb/lb) = 9,200 lbs VOC

Throughput = 200,000 lbs ***Emission Factor = 0.046 lb/lb***

c) Non-Atomized Spray Gel Coat with 41% styrene and 3% MMA, the emission factors are 0.134 lb/lb for styrene and 0.023 lb/lb for MMA

Emissions = 25,000 lbs * (0.134 lb/lb + 0.023 lb/lb) = 3,925 lbs VOC

Throughput = 25,000 lbs ***Emission Factor = 0.157 lb/lb***

d) Atomized Spray Gel Coat with 41% styrene and 3% MMA, the emission factor is 0.23 lb/lb for styrene and 0.023 lb/lb for MMA

Emissions = 60,000 lbs * (0.23 lb/lb + 0.023 lb/lb) = 15,180 lbs VOC

Throughput = 60,000 lbs ***Emission Factor = 0.253 lb/lb***

Total VOC emissions = 52,155 lbs or 26.08 tons VOC

Example 3 – Use of Emission Factor Equation in Table 2: Facility C has MSDS for resins and gel coats, and certification for VSE of 65%. The operator calculates and reports VOC emissions using specific equations with specific parameters as follows:

a) Manual Lay-up VS Resin with 36% styrene and VSE = 65%

Emission factor = [(0.286 * 0.36) – 0.0529]*[1 – (0.5*0.65)] = 0.034 lb/lb for styrene and 0.015 lb/lb for MEK

Emissions = 450,000 lbs * (0.034 lb/lb + 0.015 lb/lb) = 22,050 lbs VOC

Throughput = 450,000 lbs ***Emission Factor = 0.049 lb/lb***

b) Mechanical Non-Atomized Spray VS Resin with 36% styrene and VSE = 65%

Emission factor = [(0.157 * 0.36) – 0.0165]*[1 – (0.45*0.65)] = 0.028 lb/lb for styrene and 0.015 lb/lb for MEK

Emissions = 200,000 lbs * (0.028 lb/lb + 0.015 lb/lb) = 8,600 lbs VOC

Throughput = 200,000 lbs ***Emission Factor = 0.043 lb/lb***

c) Non-Atomized Spray Gel Coat with 41% styrene and 3% MMA

Emission factor = [(0.4506 * 0.41) – 0.0505] + (0.75 * 0.03) = 0.157 lb/lb

Emissions = 25,000 lbs * 0.157 lb/lb = 3,925 lbs VOC

Throughput = 25,000 lbs ***Emission Factor = 0.157 lb/lb***

d) Atomized Spray Gel Coat with 41% styrene and 3% MMA

Emission factor = (1.03646 * 0.41) – 0.195 + (0.75 * 0.03) = 0.252 lb/lb

Emissions = 60,000 lbs * 0.252 lb/lb = 15,120 lbs VOC

Throughput = 60,000 lbs ***Emission Factor = 0.252 lb/lb***

Total VOC emissions = 49,695 lbs or 24.85 tons VOC

TABLE 1 – DEFAULT EMISSION FACTORS

Polyester Resin Common Operations (lb/lb)	
Resin - Manual	0.067
Resin - Spray	0.120
Resin - Mechanical Flow/Roll	0.050
Gel Coat	0.360
Resin Additives	0.050
Other Related Material-Use ONLY	MSDS

TABLE 2 –EMISSION FACTOR EQUATIONS

OPEN MOLDING

RESINS APPLICATION

Manual

Lay-Up

Resins with Styrene Content S ≤ 32%:	EF = 0.126 * S
Resins with Styrene Content S ≥ 33%:	EF = (0.286 * S) – 0.0529
Resins Containing VS and Styrene Content S ≤ 32%:	EF = 0.126 * S * (1 – 0.5 * VSE)
Resins Containing VS and Styrene Content S ≥ 33%:	EF = [(0.286 * S) – 0.0529] * (1 – 0.5 * VSE)

Tooling

Resins with Styrene Content S ≤ 32%:	EF = 0.126 * S
Resins with Styrene Content S ≥ 33%:	EF = (0.286 * S) – 0.0529
Resins Containing VS and Styrene Content S ≤ 32%:	EF = 0.126 * S * (1 – 0.5 * VSE)
Resins Containing VS and Styrene Content S ≥ 33%:	EF = [(0.286 * S) – 0.0529] * (1 – 0.5 * VSE)

Mechanical

Atomized

Resins with Styrene Content S ≤ 32%:	EF = 0.169 * S
Resins with Styrene Content S ≥ 33%:	EF = (0.714 * S) – 0.18
Resins Containing VS and Styrene Content S ≤ 32%:	EF = 0.169 * S * (1 - 0.45 * VSE)
Resins Containing VS and Styrene Content S ≥ 33%:	EF = [(0.714 * S) – 0.18] * (1 - 0.45 * VSE)

Non-Atomized

Resins with Styrene Content S ≤ 32%:	EF = 0.107 * S
Resins with Styrene Content S ≥ 33%:	EF = (0.157 * S) – 0.0165
Resins Containing VS and Styrene Content S ≤ 32%:	EF = 0.107 * S * (1 - 0.45 * VSE)
Resins Containing VS and Styrene Content S ≥ 33%:	EF = [(0.157 * S) – 0.0165] * (1 - 0.45 * VSE)

Robotic/Automated Spray

Resins with Styrene Content S ≤ 32%:	EF = 0.130 * S
Resins with Styrene Content S ≥ 33%:	EF = 0.77 * [(0.714 * S) – 0.18]
Resins Containing VS and Styrene Content S ≤ 32%:	EF = 0.130 * S * (1 - 0.45 * VSE)
Resins Containing VS and Styrene Content S ≥ 33%:	EF = 0.77 * [(0.714 * S) – 0.18] * (1 - 0.45 * VSE)

Filament

Resins with Styrene Content S ≤ 32%:	EF = 0.184 * S
Resins with Styrene Content S ≥ 33%:	EF = (0.2746 * S) – 0.0298
Resins Containing VS and Styrene Content S ≤ 32%:	EF = 0.120 * S
Resins Containing VS and Styrene Content S ≥ 33%:	EF = 0.65 * (0.2746 * S) – 0.0298

GEL COATS APPLICATION

Gel Coats without Methyl Methacrylate (MMA)

Atomized

Gel Coats with Styrene Content S $\leq$ 32%:	EF = (0.445 * S)
Gel Coats with Styrene Content S $\geq$ 33%:	EF = (1.03646 * S) – 0.195

Non-Atomized

Gel Coats with Styrene Content S $\leq$ 18%:	EF = (0.185 * S)
Gel Coats with Styrene Content S $\geq$ 19%:	EF = (0.4506 * S) – 0.0505

Robotic/Automated Spray

Gel Coats with Styrene Content S $\leq$ 32%:	EF = (0.325 * S)
Gel Coats with Styrene Content S $\geq$ 33%:	EF = 0.73 * [(1.03646 * S) – 0.195]

Gel Coats with Methyl Methacrylate

Atomized

Gel Coats with Styrene Content S $\leq$ 32%:	EF = (0.445 * S) **+ [0.75 * MMA]**
Gel Coats with Styrene Content S $\geq$ 33%:	EF = (1.03646 * S) – 0.195 **+ [0.75 * MMA]**

Non-Atomized

Gel Coats with Styrene Content S $\leq$ 18%:	EF = (0.185 * S) **+ [0.75 * MMA]**
Gel Coats with Styrene Content S $\geq$ 19%:	EF = (0.4506 * S) – 0.0505 **+ [0.75 * MMA]**

Robotic/Automated Spray

Gel Coats with Styrene Content S $\leq$ 32%:	EF = (0.325 * S) **+ [0.75 * MMA]**
Gel Coats with Styrene Content S $\geq$ 33%:	EF = 0.73 * [(1.03646 * S) – 0.195] + **[0.75 * MMA]**

OTHER OPERATIONS

Closed Molding / Injection Molding / Polymer (Marble) Casting

Resins with Styrene Content S:	EF = 0.02 * S
Resins Containing VS with Styrene Content S:	EF = 0.015 * S

Pultrusion

Resins with Styrene Content S:	EF = 0.055 * S
Resins Containing VS with Styrene Content S:	EF = 0.03 * S

Covered-Cure after Roll-Out

Non-VS Resins in Manual Operations:	EF = 0.80 * Equation Listed Above
Non-VS Resins in Mechanical Operations:	EF = 0.85 * Equation Listed Above

Covered-Cure without Roll-Out

Non-VS Resins in Manual Operations:	EF = 0.50 * Equation Listed Above
Non-VS Resins in Mechanical Operations:	EF = 0.55 * Equation Listed Above

TABLE 3 –EMISSION FACTORS FOR COMMON STYRENE AND MMA CONTENTS (lb/lb)

Emission Rate in Pounds of VOC Emitted per Pound of Resin or Gelcoat Processed

Common Styrene Content in Resin/Gelcoat, %	33	34	35	36	37	38	39	40	41	42	43	44	45
Manual - Lay-Up	0.041	0.044	0.047	0.050	0.053	0.056	0.059	0.062	0.064	0.067	0.070	0.073	0.076
- Lay-Up with Vapor Suppressed Resin	0.031	0.033	0.035	0.038	0.040	0.042	0.044	0.046	0.048	0.050	0.053	0.055	0.057
- Tooling	0.041	0.044	0.047	0.050	0.053	0.056	0.059	0.062	0.064	0.067	0.070	0.073	0.076
- Tooling with Vapor Suppressed Resin	0.031	0.033	0.035	0.038	0.040	0.042	0.044	0.046	0.048	0.050	0.053	0.055	0.057
Mechanical - Atomized	0.056	0.063	0.070	0.077	0.084	0.091	0.098	0.106	0.113	0.120	0.127	0.134	0.141
- Atomized with Vapor Suppressed Resin	0.043	0.049	0.054	0.060	0.065	0.071	0.076	0.082	0.087	0.093	0.098	0.104	0.110
- Non-Atomized	0.035	0.037	0.038	0.040	0.042	0.043	0.045	0.046	0.048	0.049	0.051	0.053	0.054
- Non-Atomized with Vapor Suppressed Resin	0.027	0.029	0.030	0.031	0.032	0.033	0.035	0.036	0.037	0.038	0.040	0.041	0.042
- Robotic / Automated - Resin Spray	0.043	0.048	0.054	0.059	0.065	0.070	0.076	0.081	0.087	0.092	0.098	0.103	0.109
- Robotic / Automated - Resin Spray with VS Resin	0.033	0.037	0.042	0.046	0.050	0.054	0.059	0.063	0.067	0.072	0.076	0.080	0.084
Filament application	0.061	0.064	0.066	0.069	0.072	0.075	0.077	0.080	0.083	0.086	0.088	0.091	0.094
Filament application with VS Resin	0.040	0.041	0.043	0.045	0.047	0.048	0.050	0.052	0.054	0.056	0.057	0.059	0.061
Closed / Injection Molding / Polymer (Marble) Casting	0.007	0.007	0.007	0.007	0.007	0.008	0.008	0.008	0.008	0.008	0.009	0.009	0.009
Closed / Injection Molding / Polymer (Marble) Casting with VS	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.007	0.007
Pultrusion	0.018	0.019	0.019	0.020	0.020	0.021	0.021	0.022	0.023	0.023	0.024	0.024	0.025
Pultrusion with VS	0.010	0.010	0.011	0.011	0.011	0.011	0.012	0.012	0.012	0.013	0.013	0.013	0.014
Gelcoat - Atomized Application	0.147	0.157	0.168	0.178	0.188	0.199	0.209	0.220	0.230	0.240	0.251	0.261	0.271
- Non-Atomized Application	0.098	0.103	0.107	0.112	0.116	0.121	0.125	0.130	0.134	0.139	0.143	0.148	0.152
- Robotic / Automated Gelcoat Spray	0.107	0.115	0.122	0.130	0.138	0.145	0.153	0.160	0.168	0.175	0.183	0.191	0.198

Emission Rate in Pounds of Methyl Methacrylate Emitted per Pound of Gelcoat Processed

Common MMA content in Gelcoat, %	1	2	3	4	5	6	7	8	9	10	11	12	13
Emission Rate, lb/lb of Gel Coat	0.008	0.015	0.023	0.030	0.038	0.045	0.053	0.060	0.068	0.075	0.083	0.090	0.098

Office of the County Executive

Adam Streight
County Executive

Dan Schneckenburger
Director of Administration

Office: 410.996.5202
Fax: 800.863.0947

Department of Land Use & Development Services

Stephen O'Connor, AICP, Director
Office: 410.996.5220
Fax: 800.430.3829

Bryan Lightner, CFM
Chief / Zoning Administrator
410.996.5220

County Information
410.996.5200
410.658.4041

CECIL COUNTY, MARYLAND

Division of Planning and Zoning
200 Chesapeake Boulevard, Elkton, MD 21921

October 17, 2025

Composites USA
1 Peninsula Drive
North East, MD 21901

RE: Zoning Verification
One Peninsula Drive (Acct ID: 0805083281)

To whom it may concern,

The Division of Planning and Zoning of the Department of Land Use and Development Services for Cecil County has received your request for the Verification of Zoning.

The current zoning is M1 - Light Industrial.

Please see the Permissible Uses sheet in the Cecil County Zoning ordinaces, Section 54.4 to inquiry about potential uses. If you have a specific use you wanted to inquire about you may contact me directly.

If you have any questions, please feel free to contact us at 410-996-5220 or respond through Opengov through a Customer Service Request.

Sincerely,

Sean Gizzi
Planner II, Planning & Zoning Division
Department of Land Use & Development Services
200 Chesapeake Blvd., Suite 2300
Elkton, Maryland 21921
P: 410-996-5220 **E**: sgizzi@cecilcountymd.gov