

From: [Air.Pollution Control](#)
To: [APC Permitting](#)
Subject: FW: Denso manufacturing Athens TN- Construction permit application (54-0158/981911)
Date: Tuesday, November 28, 2023 12:46:04 PM
Attachments: [image002.png](#)
[image003.png](#)
[Sealer Coat Line Map.pdf](#)
[APC 100.pdf](#)
[APC 101.pdf](#)
[APC 102.pdf](#)
[Calculations.pdf](#)
[Humiseal 1B51-SDS.pdf](#)
[Letter.pdf](#)
[MCH sds.pdf](#)
[Process Flow.pdf](#)
[SDS Isopropyl Alcohol 70.pdf](#)
[ECU PTE Calculations - 112823.xlsx](#)

From: Sarosh Kaiser <Sarosh.Kaiser@tn.gov>
Sent: Tuesday, November 28, 2023 10:36 AM
To: Air.Pollution Control <Air.Pollution.Control@tn.gov>
Cc: John Fuss <John.Fuss@tn.gov>
Subject: FW: Denso manufacturing Athens TN- Construction permit application (54-0158/981911)

Please upload these to smog log.
Company name: Denso Manufacturing Athens TN, Inc.
Facility ID: 54-0158
Log No : 981911

Thanks!
Sarosh

From: Stacey Melton <stacey.melton@na.denso.com>
Sent: Tuesday, November 28, 2023 8:32 AM
To: Sarosh Kaiser <Sarosh.Kaiser@tn.gov>; Julie Verissimo <Julie.Verissimo@tn.gov>
Cc: Eddie Franks <eddie.franks@na.denso.com>
Subject: [EXTERNAL] RE: Denso manufacturing Athens TN- Construction permit application (54-0158/981911)

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

Sarosh,

Enclosed you will find signed forms for the Denso Manufacturing Athens TN Construction Permit for Zonal ECU. There has also been a change in chemicals per Engineering in the last week. With everyone on vacation at this time of year, we are just now getting this information. I have enclosed

updated forms, calculations and SDS's.

Please feel free to contact Eddie or myself with any questions.



Stacey Melton

Advanced Specialist – Safety, Health, and Environment
DENSO Manufacturing Athens Tennessee, Inc.

Email stacey.melton@na.denso.com

Front Desk: 423-746-0000

From: Sarosh Kaiser <Sarosh.Kaiser@tn.gov>

Sent: Monday, November 27, 2023 12:37 PM

To: Stacey Melton <stacey.melton@na.denso.com>

Cc: Julie Verissimo <Julie.Verissimo@tn.gov>; Eddie Franks <eddie.franks@na.denso.com>

Subject: Denso manufacturing Athens TN- Construction permit application (54-0158/981911)

Stacey,

The construction permit application forms received on November 1, 2023 by the division for the new installation at the Athens facility are not signed or dated. Please sign and date the forms and send it to us.

Also going forward please continue to cc all correspondence to Ms. Julie Verissimo since I will be out on annual leave for a month (starting this Friday, December 1).

Thank you!

Sarosh

Sarosh Kaiser



Sarosh Kaiser | Environmental Protection Specialist

Division of Air Pollution Control

William R. Snodgrass Tennessee Tower

312 Rosa L. Parks Avenue, 15th Floor

Nashville, TN 37243

Phone No : 615-532-0585

E mail : sarosh.kaiser@tn.gov

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DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor, Nashville, TN 37243
Telephone: (615) 532-0554, Email: Air.Pollution.Control@TN.gov

APC 100

**NON-TITLE V PERMIT APPLICATION
FACILITY IDENTIFICATION**

Type or print and submit. Attach appropriate source description forms.			
SITE INFORMATION			
1. Organization's legal name and SOS control number [as registered with the TN Secretary of State (SOS)] Denso Manufacturing Athens, TN, Inc. SOS Control # 439375			
2. Site name (if different from legal name)			
3. Is a construction permit application fee being submitted? Yes ☒ No ☐ (see instructions for appropriate fee to submit)			
4. Site address (St./Rd./Hwy.) 2400 Denso Drive			County name McMinn
City Athens		Zip code 37303	5. NAICS or SIC code 336320
6. Site location (in lat. /long.)	Latitude 35-28-37	Longitude 84-3-41	
CONTACT INFORMATION (RESPONSIBLE PERSON)			
7. Responsible person/Authorized contact Eddie Franks		Phone number with area code 423-746-0000 ext 7542	
Mailing address (St./Rd./Hwy.) 2400 Denso Drive		Fax number with area code	
City AThens	State TN	Zip code 37303	Email address eddie.franks@na.denso.com
CONTACT INFORMATION (TECHNICAL)			
8. Principal technical contact Stacey Melton		Phone number with area code 423-746-0000 ext 7521	
Mailing address (St./Rd./Hwy.) 2400 Denso Drive		Fax number with area code	
City Athens	State TN	Zip code 37303	Email address stacey.melton@na.denso.com
CONTACT INFORMATION (BILLING)			
9. Billing contact Stacey Melton		Phone number with area code 423-746-0000 ext 7521	
Mailing address (St./Rd./Hwy.) 2400 Denso Drive		Fax number with area code	
City Athens	State TN	Zip code 37303	Email address stacey.melton@na.denso.com

AIR CONTAMINANT SOURCE(S) INFORMATION

10. Description of air contaminant source(s) and Unique Source ID(s). List, identify, and briefly describe process emission sources, fuel burning installations, and incinerators that are contained in this application and include a Unique Source ID for each source. The Unique Source ID is a name/number/letter, which uniquely identifies the air contaminant source(s), like Boiler #1, Paint Line #1, Engine #1, etc. (see instructions for more details)

This application is for the addition of the Zonal ECU (Electronic Control Unit) cleanroom in Plant 701 and will be a new source for Plant 701 and the DMAT campus. The cleanroom process will consist of manual sealant, manual service, manual sealer coat, auto sealant, auto sealant coat lines. Total of 9 lines.

11. Is the air contaminant source(s) in a nonattainment area? If "Yes", then minor source BACT must be addressed. Yes ☐ No ☒

12. Normal operation:	Hours/Day 24	Days/Week 5	Weeks/Year 52	Days/Year 260
13. Percent annual throughput	Dec. – Feb. 25%	March – May 25%	June – August 25%	Sept. – Nov. 25%

TYPE OF PERMIT REQUESTED (check appropriate box)

14. Operating permit ☐	Date construction started	Date completed	Date of ownership change (if applicable)
	Last permit number(s)		Emission Source Reference Number(s)
Construction permit ☒	Last permit number(s) New Construction		Emission Source Reference Number(s)

If you chose Construction permit above, then choose either New Construction, Modification, or Location Transfer

New Construction ☒	Starting date March 2024	Completion date Aug 2025
Modification ☐	Date modification started or will start	Date completed or will complete
Location Transfer ☐	Transfer date	Address of last location

15. Describe changes that have been made to this equipment or operation(s) since the last construction or operating permit application:

New Source- New Construction

16. Comments

This will be a staggered start with Manual lines arriving onsite March 2024 with mass production July 2024. Auto lines arriving August 2024 with mass production August 2025. All lines will exhaust to the North TO#1 and South #2 TO units. TO units utilize natural gas fuel source.

Source 54-0158-30: Four Heater Assembly Operations (1#, #2, #3, #4).

Source 54-0158-38 Monolithic Carrier production: consisting of mixing/extruding process with baghouse as control: kiln #1 with thermal oxidizers as control: kiln #2 with thermal oxidizer as control.

Source 54-0158-29: Fuel systems calibration and valve assembly rooms.

Source 54-0158-44: Fuel systems fabrication.

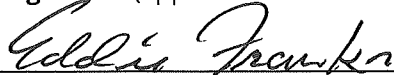
Source 46: Fuel Systems Production Process

SIGNATURE

Based upon information and belief formed after a reasonable inquiry, I, as the responsible person of the above mentioned facility, certify that the information contained in this application is accurate and true to the best of my knowledge. As specified in TCA Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

17. Signature (application must be signed before it will be processed)

Date



11/28/2023

Signer's name (type or print)

Title

Phone number with area code

Eddie Franks

SHE. MANAGER

901 652 8887



DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 15th Floor, Nashville, TN 37243
Telephone: (615) 532-0554, Email: Air.Pollution.Control@TN.gov

APC 101

**NON-TITLE V PERMIT APPLICATION
EMISSION POINT DESCRIPTION**

Type or print and submit for each stack or air contaminant source. Submit with the APC 100.					
GENERAL IDENTIFICATION AND DESCRIPTION					
1. Organization's legal name and SOS control number [as registered with the TN Secretary of State (SOS)] Denso Manufacturing Athens Tennessee Inc.					
2. Unique Source ID (name/number/letter which uniquely identifies this air contaminant source, like Boiler #1) Zonal ECU Phase 1					
3. Unique Emission Point ID (name/number/letter which uniquely identifies this emission point, like Stack #1) 54-0158 Zonal ECU North TO#1 & South TO#2					
4. Brief description of air contaminant source (Attach a diagram if appropriate): Zonal ECU (Electronic Control Unit) cleanroom process will consist of manual sealant, manual service, manual sealer coat, auto sealant, auto sealant coat lines. VOC will be exhausted through the TO#1 & TO#2 See attached Diagram.					
5. Emission point location	Latitude 35:28:98	Longitude 84:38:40	6. Distance to nearest property line (Ft.) 500		
STACK AND EMISSION DATA					
7. Stack or emission point data: →	Height above grade (Ft.) 45	Diameter (Ft.) 3	Temperature (°F) 140	% of time over 125°F 100%	Direction of exit (Up, down or horizontal) Up
Data at exit conditions: →	Flow (actual Ft. ³ /Min.) 14087	Velocity (Ft. /Sec.) 33.2	Moisture (Grains/Ft. ³)		Moisture (Percent) 1.98
Data at standard conditions: →	Flow (Dry std. Ft. ³ /Min.)	Velocity (Ft. /Sec.)	Moisture (Grains/Ft. ³)		Moisture (Percent)
8. Monitoring device and recording instrument (check all that apply): Opacity monitor ☐ SO ₂ monitor ☐ NO _x monitor ☐ Strip chart ☐ Electronic data logger ☒ Other (specify in comments) ☐ No monitor (none) ☐					
9. Control device. Description of proposed monitoring, recordkeeping, and reporting to assure compliance with emission limits. Include operating parameters of control device (flow rate, temperature, pressure drop, etc.). The North TO#1 & South TO#2 Thermal oxidizers are continuously monitored and recorded by an automated monitoring device. The device is maintained by DMAT's Facilities Maintenance Dept. Any deviations in the operating temperature are reported to Safety, Health, and Environmental Dept.					

10. Air contaminants. Emission estimates for each air contaminant emitted from this point should be based on stack sampling results or engineering calculations. Calculations should be attached on a separate sheet. (see instructions for more details)

Air contaminants	Average Emissions (Lbs./Hr.)	Maximum Emissions (Lbs./Hr.)	Concentration	Average Emissions (Ton/Yr.)	Potential Emissions (Ton/Yr.)	Emissions Estimation Method Code *	Control Devices *	Control Efficiency %
Particulate matter (PM)			**					
Sulfur dioxide (SO ₂)			***					
Carbon monoxide (CO)			PPM					
Volatile organic compounds (VOC)	8.24	14.32	PPM	3.27	32.38	2	999	89.9
Nitrogen oxides (NO _x)			PPM					
Hydrogen fluoride (HF)								
Hydrogen chloride (HCl)								
Lead (Pb)								
Greenhouse gases (CO ₂ equivalents)								
Hazardous air pollutant (specify)								
Hazardous air pollutant (specify)								
Hazardous air pollutant (specify)								
Hazardous air pollutant (specify)								
Hazardous air pollutant (specify)								
Other (specify)								
Other (specify)								
Other (specify)								
Other (specify)								

11. Comments

The TO Units have minimum operating temperatures of 1448 (TO#1) and 1439(TO#2).

SIGNATURE

If this form is being submitted at the same time as an APC 100 form, then a signature is not required on this form. Date this form regardless of whether a signature is provided. If this form is NOT being submitted at the same time as an APC 100 form, then a signature is required.

Based upon information and belief formed after a reasonable inquiry, I, as the responsible person of the above mentioned facility, certify that the information contained in this application is accurate and true to the best of my knowledge. As specified in TCA Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

12. Signature <i>Eddie Franks</i>		Date <i>11/28/2023</i>
Signer's name (type or print) <i>Eddie Franks</i>	Title <i>S.H.E MANAGER</i>	Phone number with area code <i>901 652 8887</i>

* Refer to the tables in the instructions for estimation method and control device codes.

** Exit gas particulate matter concentration units: Process – Grains/Dry Standard Ft³ (70°F), Wood fired boilers - Grains/Dry Standard Ft³ (70°F), all other boilers – Lbs. /Million BTU heat input.

*** Exit gas sulfur dioxide concentrations units: Process – PPM by volume, dry bases, and boilers – Lbs. /Million BTU heat input



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 DIVISION OF AIR POLLUTION CONTROL
 William R. Snodgrass Tennessee Tower
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 Telephone: (615) 532-0554, Email: Air.Pollution.Control@TN.gov

APC 102

**NON-TITLE V PERMIT APPLICATION
 PROCESS OR FUEL BURNING SOURCE DESCRIPTION**

Type or print. Submit with the APC 100.			
GENERAL IDENTIFICATION AND DESCRIPTION			
1. Organization's legal name and SOS control number [as registered with the TN Secretary of State (SOS)] Denso Manufacturing Athens TN, Inc.		2. Emission Source Reference Number 54-0158	
3. Is this air contaminant source subject to an NSPS or NESHAP rule? Yes ☐ No ☒ If Yes, list rule citation, including Part, Subpart, and applicable Sections:			
4. Unique Source ID (see instructions) Zonal ECU Sealer Coating		5. Unique Emission Point ID (see instructions) Zonal ECU North TO#1 & South TO#2	
6. Description of air contaminant source Zonal ECU Sealer coating process that consists of incoming electrical boards being coated and outside covers assembled. Sealer Coating machine is the source of VOC material along with alcohol for cleaning purposes.			
7. Type of air contaminant source (Check only one option to the right)			
Process Emission Source: For each process emission source, submit a separate application. (Check at right and complete lines 8, 9, and 14)			☒
Process Emission Source with in process fuel: Products of combustion contact materials heated. For each process emission source, submit a separate application. (Check at right and complete lines 8 through 14)			☐
Non-Process fuel burning source: Products of combustion do not contact materials heated. Complete this form for each boiler or fuel burner and complete a Non-Title V Emission Point Description Form (APC 101) for each stack. (Check at right and complete lines 10 through 14)			☐
PROCESS EMISSION SOURCE DESCRIPTION AND DATA			
8. Type of operation: Continuous ☒ Batch ☐		Normal batch time	Normal batches/day
9. Process material inputs and In-process solid fuels	Diagram reference	Input rates (pounds/hour)	
		Design	Actual
	A. Isopropyl Alcohol	.18	.10
	B. MCH	5.54	3.19
	C. Humiseal 1B51	8.60	4.95
	D.		
	E.		
	F.		
G.			
Totals			

* A simple process flow diagram must be attached.

DESCRIPTION OF BOILER, BURNER, ENGINE, OR OTHER FUEL BURNING SOURCE							
10. Boiler or burner data: (Complete lines 10 through 14 using a separate form for each boiler, burner, etc.)							
Serial Number				Type of firing***			
Rated horsepower		Rated input capacity (10 ⁶ BTU/Hr.)		Other rating (specify capacity and units)			
Date constructed		Date manufactured		Date of last modification (explain in comments below)			
** Source with a common stack will have the same stack number. *** Cyclone, spreader (with or without reinjection), pulverized (wet or dry bottom, with or without reinjection), other stoker (specify type, hand fired, automatic, or other type (describe below in comments)).							
FUEL USED IN BOILER, BURNER, ENGINE, OR OTHER FUEL BURNING SOURCE							
11. Fuel data: (Complete for a process emission source with in process fuel or a non-process fuel burning source)							
Primary fuel type (specify)				Standby fuel type(s) (specify)			
Fuels used	Annual usage	Hourly usage		% Sulfur	% Ash	BTU value of fuel	(For APC use only) SCC code
		Design	Average				
Natural gas:	10 ⁶ Cu. Ft.	Cu. Ft.	Cu. Ft.	///////// /////////	///// /////	1,000	
#2 Fuel oil:	10 ³ Gal.	Gal.	Gal.		///// /////		
#5 Fuel oil:	10 ³ Gal.	Gal.	Gal.		///// /////		
#6 Fuel oil:	10 ³ Gal.	Gal.	Gal.		///// /////		
Coal:	Tons	Lbs.	Lbs.				
Wood:	Tons	Lbs.	Lbs.	///////// /////////	///// /////		
Liquid propane:	10 ³ Gal.	Gal.	Gal.	///////// /////////	///// /////	85,000	
Other (specify type & units):							
12. If Wood is used as a fuel, specify types and estimate percent by weight of bark							
13. If Wood is used with other fuels, specify percent by weight of wood charged to the burner.							

14. Comments

ECU Zonal includes all manual and automated sealer coating equipment.

SIGNATURE

If this form is being submitted at the same time as an APC 100 form, then a signature is not required on this form. Date this form regardless of whether a signature is provided. If this form is NOT being submitted at the same time as an APC 100 form, then a signature is required.

Based upon information and belief formed after a reasonable inquiry, I, as the responsible person of the above mentioned facility, certify that the information contained in this application is accurate and true to the best of my knowledge. As specified in TCA Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

15. Signature

		Date 11/28/2023
Signer's name (type or print) Eddie Franks	Title S.H.E. MANAGER	Phone number with area code 901 652 8887

Construction Permit Notification (For Non-Title V Sources)

TO: The Technical Secretary
Tennessee Air Pollution Control Division
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Ave. 15th Floor
Nashville, TN 37243

DENSO Manufacturing Athens Tennessee, Inc. (DMAT), located at 2400 Denso Drive, Athens, TN, is submitting this Construction permit request pursuant to TACPR 1200-03-09-.01(1)(b). DMAT is planning to begin installation of new Zonal ECU process no sooner than March 2024, with production to begin on or about August 2024.

Description of Changes:

1. Add a new Zonal ECU production processes that will consist of the following categories of processes:
 - a. Manual Sealer Application Lines(3 Total Lines)
 - b. Automated Sealer Application Lines(6 Total Lines)
2. Air emissions will be VOC.
3. VOC emissions be sent to VOC abatement systems.
4. All permit terms and conditions are still applicable.

This source is not subject to requirements of paragraphs 1200-3-9-.02(11), 1200-3-9-.01(4) or 1200-3-9-.01(5). These changes do not result in emissions exceeding the allowable under the existing operating permit. The changes will not result in the emission of any air contaminant (to which an emission standard applies) not previously emitted. Supporting material consisting of emissions calculations, SDSs, and flow diagrams have been included with this submittal. If you have any questions or require further information please contact Eddie Franks at (423) 746-0000 ext. 7521 e-mail eddie.franks@na.denso.com or Stacey Melton at (423) 746-0000 ext. 7521 e-mail stacey.melton@na.denso.com

Sincerely,


Eddie Franks

Manager, Safety Health and Environment

EHV2 ECU VOC and HAP CALCULATIONS					
IPA	Usage at 5040 hours	<u>Usage (Gal/Yr)</u> 72	<u>hrs/yr</u> 5,040	=	<u>Usage (gal/hr)</u> 0.01429
	Usage at 8760 hours	<u>Usage (gal/hr)</u> 0.0143	<u>hr/yr</u> 8,760	=	<u>Annual Use (gal/yr)</u> 125.14
	VOC PTE from IPA	<u>Annual Use (gal/yr)</u> 125.14	<u>VOC lb/gal</u> 6.59	<u>lb/ton</u> 2000	= <u>VOC ton/yr</u> 0.412
MCH	Usage at 5040 hours	<u>Usage (G/Yr)</u> 2,244	<u>hrs/yr</u> 5,040	=	<u>Usage (gal/hr)</u> 0.44524
	Usage at 8760 hours	<u>Usage (gal/hr)</u> 0.4452	<u>hr/yr</u> 8,760	=	<u>Annual Use (gal/yr)</u> 3900.29
	VOC PTE from MB21	<u>Annual Use (gal/yr)</u> 3,900.29	<u>VOC lb/gal</u> 6.42	<u>lb/ton</u> 2000	= <u>VOC ton/yr</u> 12.520
Humiseal 1B51	Usage at 5040 hours	<u>Usage (Gal/Yr)</u> 3,864	<u>hrs/yr</u> 5,040	=	<u>Usage (gal/hr)</u> 0.767
	Usage at 8760 hours	<u>Usage (gal/hr)</u> 0.7667	<u>hr/year</u> 8,760	=	<u>Annual Use (gal/yr)</u> 6716.00
	VOC PTE from Humiseal	<u>Annual Use (gal/yr)</u> 6,716.00	<u>VOC lb/gal</u> 5.79	<u>lb / ton</u> 2000	= <u>VOC ton/yr</u> 19.443
SUMMARY TABLE OF EMISSIONS					
<u>Line Name</u>	<u>VOC (ton/yr)</u>				<u>HAP (ton/yr)</u>
	<u>IPA</u>	<u>MCH</u>	<u>Humiseal 1B51</u>	<u>TOTAL</u>	<u>TOTAL</u>
EHV2 ECU	0.412	12.520	19.443	32.375	0.000
Without Control Efficiency	TOTAL VOC PTE (ton/yr)	0.412	12.5199	19.443	32.375
	TOTAL PTE (lb/hr)	1.8061	54.8372	85.1596	141.803
	Avg (lb/hr)	1.0391	31.5502	48.9959	81.5852
With Control Efficiency 89.9%	TOTAL VOC PTE (ton/yr)	0.041646917	1.264512	1.96372482	3.269883369
	TOTAL PTE (lb/hr)	0.182413497	5.538561	8.60111471	14.32208915
	Avg (lb/hr)	0.104950231	3.186569	4.94858655	8.240106089

EHV2 ECU VOC and HAP CALCULATIONS					
IPA	Usage at 5040 hours	<u>Usage (Gal/Yr)</u> 72	<u>hrs/yr</u> 5,040	=	<u>Usage (gal/hr)</u> 0.01429
	Usage at 8760 hours	<u>Usage (gal/hr)</u> 0.0143	<u>hr/yr</u> 8,760	=	<u>Annual Use (gal/yr)</u> 125.14
	VOC PTE from IPA	<u>Annual Use (gal/yr)</u> 125.14	<u>VOC lb/gal</u> 6.59	<u>lb/ton</u> 2000	= <u>VOC ton/yr</u> 0.412
MCH	Usage at 5040 hours	<u>Usage (G/Yr)</u> 2,244	<u>hrs/yr</u> 5,040	=	<u>Usage (gal/hr)</u> 0.44524
	Usage at 8760 hours	<u>Usage (gal/hr)</u> 0.4452	<u>hr/yr</u> 8,760	=	<u>Annual Use (gal/yr)</u> 3900.29
	VOC PTE from MB21	<u>Annual Use (gal/yr)</u> 3,900.29	<u>VOC lb/gal</u> 6.42	<u>lb/ton</u> 2000	= <u>VOC ton/yr</u> 12.520
Humiseal 1B51	Usage at 5040 hours	<u>Usage (Gal/Yr)</u> 3,864	<u>hrs/yr</u> 5,040	=	<u>Usage (gal/hr)</u> 0.767
	Usage at 8760 hours	<u>Usage (gal/hr)</u> 0.7667	<u>hr/year</u> 8,760	=	<u>Annual Use (gal/yr)</u> 6716.00
	VOC PTE from Humiseal	<u>Annual Use (gal/yr)</u> 6,716.00	<u>VOC lb/gal</u> 5.79	<u>lb / ton</u> 2000	= <u>VOC ton/yr</u> 19.443
SUMMARY TABLE OF EMISSIONS					
	<u>Line Name</u>	<u>VOC (ton/yr)</u>			
		<u>IPA</u>	<u>MCH</u>	<u>Humiseal 1B51</u>	<u>HAP (ton/yr)</u>
	EHV2 ECU	0.412	12.520	19.443	32.375
Without Control Efficiency	TOTAL VOC PTE (ton/yr)	0.412	12.5199	19.443	32.375
	TOTAL PTE (lb/hr)	1.8061	54.8372	85.1596	141.803
	Avg (lb/hr)	1.0391	31.5502	48.9959	81.5852
With Control Efficiency 89.9%	TOTAL VOC PTE (ton/yr)	0.041646917	1.264512	1.9637248	3.269883369
	TOTAL PTE (lb/hr)	0.182413497	5.538561	8.6011147	14.32208915
	Avg (lb/hr)	0.104950231	3.186569	4.9485865	8.240106089



SAFETY DATA SHEET

1. Identification

Product identifier	HumiSeal 1B51	
Other means of identification		
Product code	HumiSeal 1B51	
Recommended use	Protective Coating for Printed Circuit Board	
Recommended restrictions	None known.	
Manufacturer/Importer/Supplier/Distributor information		
Manufacturer		
Company name	CHASE CORPORATION Zeta Drive Plant	
Address	201 Zeta Drive Pittsburgh, Pennsylvania 15238 United States	
Telephone	1-866-932-0800	
E-mail	Not available.	
Emergency phone number	1-800-424-9300	Chemtrec, US
	(+1)703-527-3887	Chemtrec, outside of US

2. Hazard(s) identification

Physical hazards	Flammable liquids	Category 2
Health hazards	Skin corrosion/irritation	Category 2
	Reproductive toxicity	Category 2
	Specific target organ toxicity, single exposure	Category 3 narcotic effects
	Specific target organ toxicity, repeated exposure	Category 2
	Aspiration hazard	Category 1
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 2
	Hazardous to the aquatic environment, long-term hazard	Category 2
OSHA defined hazards	Not classified.	
Label elements		



Signal word Danger

Hazard statement Highly flammable liquid and vapor. May be fatal if swallowed and enters airways. Causes skin irritation. May cause drowsiness or dizziness. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure. Toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Precautionary statement

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. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe mist or vapor. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.

Response

If swallowed: Immediately call a poison center/doctor. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed or concerned: Get medical advice/attention. Call a poison center/doctor if you feel unwell. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. In case of fire: Use appropriate media to extinguish. Collect spillage.

Storage

Keep cool. Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNO C)

Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapor. May cause flash fire or explosion.

Supplemental information

21.34% of the mixture consists of component(s) of unknown acute oral toxicity. 21.34% of the mixture consists of component(s) of unknown acute dermal toxicity. 99.52% of the mixture consists of component(s) of unknown acute inhalation toxicity. 21.34% of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 21.34% of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
TOLUENE		108-88-3	70 - < 80
Other components below reportable levels			20 - < 30

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.

Skin contact

Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact

Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists.

Ingestion

Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed

Aspiration may cause pulmonary edema and pneumonitis. May cause drowsiness and dizziness. Headache. Nausea, vomiting. Direct contact with eyes may cause temporary irritation. Skin irritation. May cause redness and pain. Prolonged exposure may cause chronic effects.

Indication of immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.

General information

Take off all contaminated clothing immediately. IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media

Water fog. Foam. Carbon dioxide (CO₂). Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical	Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. This product is a poor conductor of electricity and can become electrostatically charged. If sufficient charge is accumulated, ignition of flammable mixtures can occur. To reduce potential for static discharge, use proper bonding and grounding procedures. This liquid may accumulate static electricity when filling properly grounded containers. Static electricity accumulation may be significantly increased by the presence of small quantities of water or other contaminants. Material will float and may ignite on surface of water. During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Highly flammable liquid and vapor.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Use appropriate containment to avoid environmental contamination. Transfer by mechanical means such as vacuum truck to a salvage tank or other suitable container for recovery or safe disposal. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools. This product is miscible in water. Prevent product from entering drains. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water. Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.
Environmental precautions	Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS. Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. Use appropriate containment to avoid environmental contamination.

7. Handling and storage

Precautions for safe handling	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. Minimize fire risks from flammable and combustible materials (including combustible dust and static accumulating liquids) or dangerous reactions with incompatible materials. Handling operations that can promote accumulation of static charges include but are not limited to: mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices. For additional information on equipment bonding and grounding, refer to the Canadian Electrical Code in Canada, (CSA C22.1), or the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity" or National Fire Protection Association (NFPA) 70, "National Electrical Code".
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Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Eliminate sources of ignition. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity. Store in a cool, dry place out of direct sunlight. Store in tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection**Occupational exposure limits**

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

US. OSHA Table Z-2 (29 CFR 1910.1000)

Components	Type	Value
TOLUENE (CAS 108-88-3)	Ceiling	300 ppm
	TWA	200 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
TOLUENE (CAS 108-88-3)	TWA	20 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
TOLUENE (CAS 108-88-3)	STEL	560 mg/m3
		150 ppm
	TWA	375 mg/m3
		100 ppm

Biological limit values**ACGIH Biological Exposure Indices**

Components	Value	Determinant	Specimen	Sampling Time
TOLUENE (CAS 108-88-3)	0.3 mg/g	o-Cresol, with hydrolysis	Creatinine in urine	*
	0.03 mg/l	Toluene	Urine	*
	0.02 mg/l	Toluene	Blood	*

* - For sampling details, please see the source document.

Exposure guidelines**US - California OELs: Skin designation**

TOLUENE (CAS 108-88-3) Can be absorbed through the skin.

US - Minnesota Haz Subs: Skin designation applies

TOLUENE (CAS 108-88-3) Skin designation applies.

Appropriate engineering controls

Explosion-proof general and local exhaust ventilation. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station and safety shower.

Individual protection measures, such as personal protective equipment

Eye/face protection Chemical respirator with organic vapor cartridge and full facepiece.

Skin protection

Hand protection Wear appropriate chemical resistant gloves.

Other Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection Chemical respirator with organic vapor cartridge and full facepiece.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

Observe any medical surveillance requirements. When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state	Liquid.
Form	Liquid.
Color	Clear

Odor Aromatic

Odor threshold Not available.

pH Not available.

Melting point/freezing point -138.82 °F (-94.9 °C) estimated

Initial boiling point and boiling range 231.08 °F (110.6 °C) estimated

Flash point 44.6 °F (7.0 °C)

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) 1.2 %

Flammability limit - upper (%) 7.1

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure 37.86 hPa estimated

Vapor density Not available.

Relative density Not available.

Solubility(ies)

Solubility (water) Negligible

Partition coefficient (n-octanol/water) Not available.

Auto-ignition temperature 896 °F (480 °C) estimated

Decomposition temperature Not available.

Viscosity 155 - 215 cP

Viscosity temperature 77 °F (25 °C)

Other information

Brookfield viscosity 155 - 215 cP

Density 0.89 g/cm³

Explosive properties Not explosive.

Flammability class Flammable IB estimated

Miscible (water) Negligible

Oxidizing properties Not oxidizing.

Percent volatile 78.18 % estimated

pH in aqueous solution Does not apply.

Specific gravity 0.89

VOC 78.18 % estimated

10. Stability and reactivity

Reactivity The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability Material is stable under normal conditions.

Possibility of hazardous reactions Hazardous polymerization does not occur.

Conditions to avoid Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials.

Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause drowsiness and dizziness. Headache. Nausea, vomiting. Prolonged inhalation may be harmful.
Skin contact	Causes skin irritation.
Eye contact	Direct contact with eyes may cause temporary irritation.
Ingestion	Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia.

Symptoms related to the physical, chemical and toxicological characteristics	Aspiration may cause pulmonary edema and pneumonitis. May cause drowsiness and dizziness. Headache. Nausea, vomiting. Skin irritation. May cause redness and pain.
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Information on toxicological effects

Acute toxicity	May be fatal if swallowed and enters airways.
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Product	Species	Test Results
HumiSeal 1B51		
Acute		
Dermal		
LD50	Rabbit	15510 mg/kg estimated 18.04 ml/kg estimated
Inhalation		
LC50	Mouse	6805 ppm, 8 Hours estimated 511.6 ppm, 24 Hours estimated
	Rat	34150 ppm, 1 Hours estimated 15610 ppm, 2 Hours estimated 10230 ppm, 4 Hours estimated
Oral		
LD50	Rat	3.326 g/kg estimated
Other		
LD50	Mouse	75.47 mg/kg estimated
	Rat	1704 mg/kg estimated
Components	Species	Test Results

TOLUENE (CAS 108-88-3)

Acute

Dermal

LD50	Rabbit	12120 mg/kg
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Oral

LD50	Rat	2.6 g/kg
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Skin corrosion/irritation	Causes skin irritation.
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Serious eye damage/eye irritation	Direct contact with eyes may cause temporary irritation.
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Respiratory or skin sensitization

Respiratory sensitization	Not a respiratory sensitizer.
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Skin sensitization	This product is not expected to cause skin sensitization.
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Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
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Carcinogenicity	Not classifiable as to carcinogenicity to humans.
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IARC Monographs. Overall Evaluation of Carcinogenicity

TOLUENE (CAS 108-88-3)	3 Not classifiable as to carcinogenicity to humans.
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OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity	Suspected of damaging fertility or the unborn child.
Specific target organ toxicity - single exposure	May cause drowsiness and dizziness.
Specific target organ toxicity - repeated exposure	May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard	May be fatal if swallowed and enters airways.
Chronic effects	May cause damage to organs through prolonged or repeated exposure. Prolonged inhalation may be harmful.

12. Ecological information**Ecotoxicity** Toxic to aquatic life with long lasting effects.

Product		Species	Test Results
HumiSeal 1B51			
Aquatic			
Crustacea	EC50	Daphnia	13.0756 mg/l, 48 hours estimated
Fish	LC50	Fish	112.879 mg/l, 96 hours estimated
Components		Species	Test Results
TOLUENE (CAS 108-88-3)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	5.46 - 9.83 mg/l, 48 hours
Fish	LC50	Coho salmon,silver salmon (Oncorhynchus kisutch)	8.11 mg/l, 96 hours

Persistence and degradability No data is available on the degradability of any ingredients in the mixture.**Bioaccumulative potential****Partition coefficient n-octanol / water (log Kow)**

TOLUENE 2.73

Mobility in soil No data available.**Other adverse effects** The product contains volatile organic compounds which have a photochemical ozone creation potential.**13. Disposal considerations**

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Incinerate the material under controlled conditions in an approved incinerator. Do not incinerate sealed containers. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. If discarded, this product is considered a RCRA ignitable waste, D001. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	D001: Waste Flammable material with a flash point <140 F The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information**DOT**

UN number	UN1263
UN proper shipping name	PAINT

Transport hazard class(es)	
Class	3
Subsidiary risk	-
Label(s)	3
Packing group	II
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	B1, B52, IB3, T4, TP1, TP29
Packaging exceptions	150
Packaging non bulk	202
Packaging bulk	242

IATA

UN number	UN1263
UN proper shipping name	PAINT
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	II
Environmental hazards	No.
ERG Code	3L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Allowed with restrictions.
Cargo aircraft only	Allowed with restrictions.

IMDG

UN number	UN1263
UN proper shipping name	PAINT
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	II
Environmental hazards	
Marine pollutant	No.
EmS	F-E, S-D
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

DOT



IATA; IMDG



15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

TOLUENE (CAS 108-88-3)

Listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical

Yes

Classified hazard categories

Flammable (gases, aerosols, liquids, or solids)
Acute toxicity (any route of exposure)
Skin corrosion or irritation
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)
Aspiration hazard
Hazard not otherwise classified (HNOC)

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
TOLUENE	108-88-3	70 - < 80

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

TOLUENE (CAS 108-88-3)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)

Not regulated.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

TOLUENE (CAS 108-88-3)

6594

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

TOLUENE (CAS 108-88-3)

35 %WV

DEA Exempt Chemical Mixtures Code Number

TOLUENE (CAS 108-88-3)

594

US state regulations

California Proposition 65



WARNING: This product can expose you to TOLUENE, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California Proposition 65 - CRT: Listed date/Developmental toxin

TOLUENE (CAS 108-88-3)

Listed: January 1, 1991

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

TOLUENE (CAS 108-88-3)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	05-14-2015
Revision date	08-18-2018
Version #	04
HMIS® ratings	Health: 3* Flammability: 3 Physical hazard: 0
NFPA ratings	Health: 2 Flammability: 3 Instability: 0
Disclaimer	The information offered in this data sheet is designed only as guidance for the safe use, storage and handling of the product. This information is correct to the best of our knowledge and belief at the date of publication, however, no guarantee is made to its accuracy. This 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 other process. This material is intended for industrial use only. No warranty, expressed or implied is made.
Revision information	This document has undergone significant changes and should be reviewed in its entirety.

Prepared on 2011/2/1
 Revision date 2012/2/20
 Revision date 2013/2/6
 Revision date 2012/3/19
 Revision date 2015/12/24
 Revision date 2020/4/29

SAFETY DATA SHEET

1 Chemical Substance and Company Information

Product Name :Methylcyclohexane (MCH)
 Supplier :Nikkatsu Synthetic Industry Co, Ltd.
 Address :Ohshima-69 Kitasaki-chou Ohbu-city Aichi-pref Japan
 TEL :+81-0562-46-5147
 FAX :+81-0562-46-1780
 Mail Address :yamamoto@nikkatsugousei.jp
 Recommend and Limit of the use Paint Dilute Material

2 Hazard Toxic Summary

GHS classification	
Flammable liquid	:Category 2
Acute toxicity oral	:Category 4
Skin dermal	:Out of category
Inhalation : Gas	:Out of classification subject
Inhalation : Vapor	:Out of category
Inhalation: Dust, mist	:Cannot classification
Skin irritation corrosion	:Category 3
Serious eye damage Irritation	:Category 2B
Respiratory organ sensitization characteristics solid/liquid	:Cannot classification
Gas	:Cannot classification
Skin sensitization characteristics	:Cannot classification
Germ cell mutagenicity	:Cannot classification
Carcinogenicity	:Cannot classification
Toxic to reproduction	:Cannot classification
For the nursing or additional division about the influence through the nursing	:Cannot classification
Specific target organ systemic toxicity (single exposure)	:Category 3
Specific target organ systemic toxicity (repeated exposure)	:Out of category
Aspiration hazard	:Cannot classification
Aquatic toxicity (acute)	:Category 2
Aquatic toxicity (chronic)	:Category 2
Harmful for ozone layer	:Cannot classification

Symbol(s)



Signal words

Danger

GHS hazard statements

Harmful if swallowed
 Causes eye irritation
 May be sleepiness or giddiness
 Toxic to aquatic life with long lasting effects

Statements

【Safety measure】

Keep container tightly closed
 Keep away from heat/sparks/open flames/hot surfaces. No smoking
 Use explosion-proof electrical/ventilating/lighting equipment
 Wear protective gloves/protective clothing/eye protection/face protection
 After handling, do enough wash your hands and gargling
 When fire happened extinguish use foam or powder extinguisher
 Avoid release to the environment
 Don't use except originally purpose, thinner play, dirt take out etc

【First aid procedure】

Move victim immediately to the place where fresh air is available.
 Obtain medical attention promptly.
 Get medical attention promptly.
 Flush eyes immediately with flowing clean water for at least 15 minutes.
 In pain persists, get medical attention by oculist.
 Wash affected skin with flowing water or lukewarm water, then wash off
 contaminant thoroughly with soap.
 Remove contaminated clothing and shoes immediately.

【Storage】

Store the product in well-ventilated, dark and cool place.
 Keep the product away from ignition and heat sources.

【Waste】

Contents/container waste for the metropolitan and prefectural/cities,towns
 and villages.

3 Composition・Ingredient Information

Distinction of Chemical matter・Mixture

:Mixture

Ingredient and amount of a content

Matter Name	CAS No	Amount of content(wt%)
Methylcyclohexane	108-87-2	Over 99

4 First Aid Measure

Eye contact

Flush eyes immediately with flowing clean water for at least 15 minutes.
 At washing eyes, make water reach every corner of eyes balls and inside of
 eyelids by holding eyelids with fingers.
 In pain persists, get medical attention by oculist.

Skin contact

Remove contaminated clothing and shoes immediately.
 Wash affected skin with flowing water or lukewarm water, then wash off
 contaminant thoroughly with soap.
 In pain persists, get medical attention.

Inhalation

Move victim immediately to the place where fresh air is available.
 In case of no or very poor breathing, secure breathing trachea by loosening
 clothing and give artificial respiration.
 Wrap victim with blanket and keep victim at rest and warm.
 Obtain medical attention promptly.

Ingestion

Because the product is volatile, it is dangerous to induce vomiting.
 Get medical attention promptly.
 If victim is unconscious, do not give anything orally.

5 Fire Fighting Measure

Effective fire extinguishing

Powder, carbon dioxide, foam and dried sand.

Fire fighting method

Remove flammables from surroundings.
 Container exposed high temperature cool sprinkle water.
 Fire fighting operation wear proper protector, from windward.
 Specific fire extinguisher use for fire fighting operation. Don't use water.

6 Measure in case of Leak

When leak operation , wear proper protector.
 Near ignition , high temperature material , flammables move another place.
 In case of small leaks , absorb with sand or soil and recover in case with lids.
 In case of large leaks , dam leaks with sand or soil, and after absorb leaks.
 Side ditch , sewerage e.t.c stop flow out , get back sealed container.

7 Precautions for Handling and Storage

Handling

Absolutely no ignition sources such as fire, static electricity and shock
 spark around the place where this product is handled.
 Leak , over flow , scatter prevent and don't scatter vapor.
 When operation wear prevent electrification clothes , shoes.
 Handling machine , equipment install , use prevent burst machine.
 Sealed place operation set up limited exhaust device , wear proper protector.

Storage

Store the product in well-ventilated, dark and cool place.
 Keep the product away from ignition and heat sources.
 Used container store safely place.

8 Measure to Avoid Exposure and Protection

Matter name	Management concentration (ppm)	ACGHI (TLV)
Methylcyclohexane	-	400

Equipment

Handling machine , equipment install , use prevent burst machine.
 When indoor operation sealed vapor occur , form limited exhaust device.
 Near ignition , high temperature material , don't put operation place.
 Operation place form safety shower , wash hands , wash eyes , clear the place.

Respiratory organ protector

Wear gas mask for organic gas , send air mask.

Eye protector

Wear protector glasses , facial protector.

Skin protector

Wear gloves material for thinner don't penetrate.

Other protector

Wear turn on the electricity shoes , when static electricity painting operation.
 Wear apron and perfect protect clothes as operation.

9 Physical and Chemical Property

Physical state , form , color	:Colorless liquid
Odour	:Thinner smell
PH	:No come under
Boiling point , initial boiling point and boiling range	:100.9°C
Flash point	:-3.9°C
Burst range	:1.1~6.7vol%
Octanol / water distribution coefficient	:4.13
Auto ignition temperature	:309°C
Vapor pressure	:6.2kPa(25°C)
Vapor density(air = 1)	:3.4
Specific gravity (density)	:0.770g/cm ³ (15°C)
Solubility	:Almost no soluble to water , mixed free to alcohol and ether
Decomposition temperature	:No data
Odour threshold	:No data
Evaporation rate(nBuAc = 1)	:No data
Flammability	:No data
Viscosity	:0.732Pa·s (20°C)

10 Stability and Reactivity

Stability

Static electricity may result by mobility or stir e.t.c..

Possibility of hazardous reactions

React with strong oxidising agents , result fire and burst.

Conditions to avoid

High temperature

Incompatible materials hazardous

Strong oxidising agents, strong alkalizing agents, strong oxidising.

Decomposition products

When burn , result toxic gas (carbon monoxide , carbon dioxide).

11 Toxicological Information

Acute toxicity oral	Methylcyclohexane
Dermal	Category 4
Inhalation	Out of category
(vapor)	Out of category
Inhalation	Cannot classification
(dust , mist)	
Skin corrosion/irritation	Category 3
Eye damage/irritation	Category 2B
Respiratory sensitization	Cannot classification
Skin sensitization	Cannot classification
Germ cell mutagenicity	Cannot classification
Carcinogenicity	Cannot classification
Reproductive toxicity	Cannot classification
Specific target organ toxicity	Category 3
(single exposure)	
Specific target organ toxicity	Out of category
(repeated exposure)	
Aspiration hazard	Cannot classification

12 Ecological Information

Aquatic acute toxicity	Methylcyclohexane
Aquatic chronic toxicity	Category 2
Harmful for ozone layer	Category 2
	Cannot classification

13 Disposal Considerations

Remainder waste	About disposal obey reration laws and regurations and local government regurations. Industory waste disposal dealer approved metroporitan and prefectual governments e.t.c. or in case of local public body approve , approval dealer commit enough informed hazardous and harmful.
Pollution container and wrapping	Container recycle cleaned or obey reration laws and regurations and local public body regurations proper disposal. In case of disposal empty container remove perfect contents.

14 Precaution for Transportation

Common	Follow the general precautions in regard to highly flammable and hazard liquids described in "Precautions for Handling and Storage". Avoid violent handling of containers which cause overturn, fall, shock or drag. Shift prevent certain.
Ground transportation	In case of fire service law and industrial safety health law and poison and toxic control law come under , obey carry method determined each law.
Sea/aviation transportation	Obey determined ships safety law and aviation law.
UN No.	1263
Marine pollutant	Yes
Packing group	2

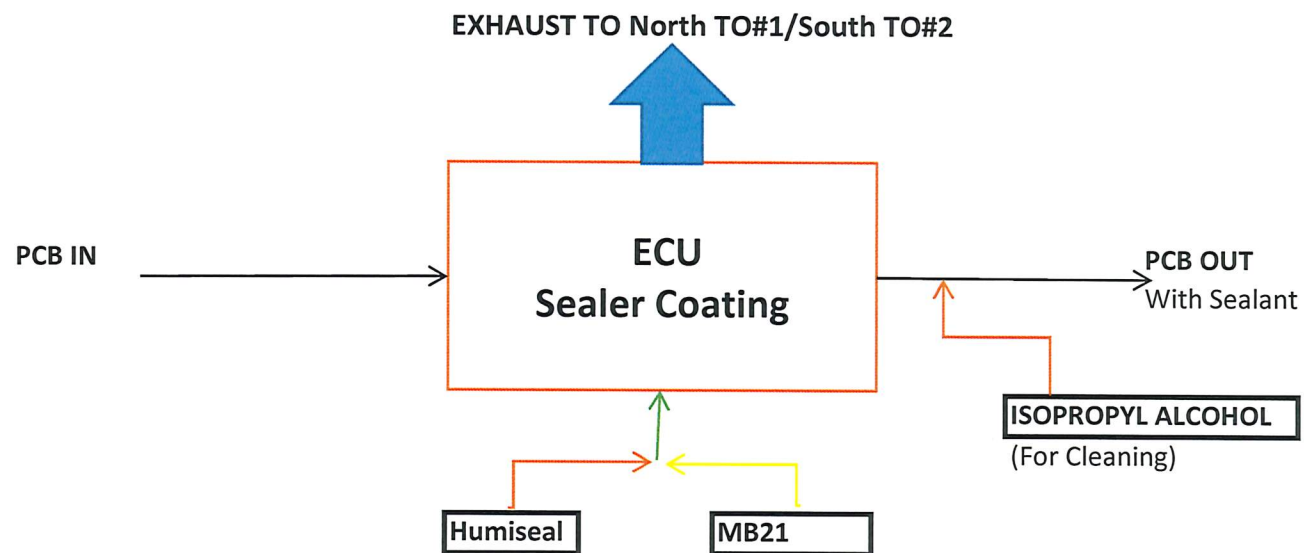
15 Relevant Regulations

Industry safety and health law	Hazard substance (Flammable material), Organic solvent not come under
Fire service law	Class 4, No.1 Petroleum group (Non water-soluble liquid)
Ships safety law	Middle flash point flammable liquid.
PRTR law	Not come under
Marine pollutant & marine disasters prevention law	Harmful liquid (Y group)
Quotation book	Material safety data sheet guide book " Mixture(Paint)" japan paint industry association MSDS material data base japan paint industry association

Caution Becsuse hazard and toxic evaluation may be not enough , be careful for treatment.

END

ECU Sealer Coating



Safety Data Sheet
Isopropyl Alcohol, 70%

SECTION I - IDENTIFICATION



**Research
Solutions**

Research Solutions Group, Inc.
402 Industrial Park Drive
Pelham, AL 35124
(205) 663-6350
Chemtrec :..... (800) 424-9300

Product Number 11175
Product Name Isopropyl Alcohol, 70%
Chemical Family Solvent Blend
CAS Number Multiple
Date Prepared 2/19/1994
Revision Date 10/26/2021
Recommended Use Industrial Use Only

SECTION II - HAZARDOUS IDENTIFICATION

GHS CLASSIFICATION:

Classification

Flammable Liquids	Category 2
Serious Eye Damage/Eye Irritation	Category 2A
Specific target organ toxicity, single exposure, Narcotic	Category 3

DANGER!

GHS LABEL:



Hazard Statements

H225	Highly flammable liquid and vapor
H319	Causes serious eye irritation
H336	May cause dizziness or drowsiness

Safety Data Sheet

Isopropyl Alcohol, 70%

Precautionary Statements

P210	Keep away from heat, hot surfaces, sparks, open flames, and other ignition, sources. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting/equipment, etc.
P242	Use only non-sparking tools.
P243	Take precautionary measures to prevent static discharge.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P264	Wash hands and exposed body parts thoroughly after handling.
P271	Use only outdoors or in a well-ventilated are.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+361+353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water or shower.
P304+340	IF INHALED: Remove victim to fresh air and keep comfortable for breathing.
P305+351+338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do so - continue rinsing.
P312	Call a POISON CENTER or a doctor/physician if you feel unwell.
P337+313	If eye irritation persists get medical advice/attention.
P370+378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403+233	Store in a well ventilated place. Keep container tightly closed.
P403+235	Store in a well ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal facility.

SECTION III - COMPOSITION/INFORMATION ON INGREDIENTS

The precise composition of this product is proprietary information. In the event of a medical emergency, a complete disclosure will be provided to medical personnel.

Component Name	CAS #	Component%	OSHA PEL	ACGIH TLV
Isopropyl Alcohol	67-63-0	70%	400 ppm	200ppm (TWA)
Water	7732-18-5	30%	Not Established	Not Established

SECTION IV - FIRST AID MEASURES

Contact with eyes: 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 15 minutes. Seek immediately medical attention.

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Isopropyl Alcohol, 70%

- Skin contact:** Wash exposed areas with water and mild soap. Remove contaminated clothing immediately and launder before reuse. If irritations persist, seek immediate medical attention.
- Inhalation:** Remove victim to fresh air. Administer oxygen or artificial respiration if breathing is affected or stopped. Seek immediate medical attention.
- Ingestion:** Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

SECTION V - FIREFIGHTING MEASURES

- Suitable Extinguishing Media:** Water fog, alcohol-resistant foam, Carbon dioxide (CO₂), dry chemical.
- Special Fire Fighting Procedures** Use self-contained breathing apparatus and full bunker gear in fire areas. Evacuate all unprotected personnel from area. Keep containers cool with water fog to minimize swelling taking care not to spread flames with water used for cooling.
- Unusual Fire Fighting Hazards:** Product is flammable and may be ignited by heat, sparks, flames or other sources of ignition (e.g., static electricity, pilot lights or mechanical/electrical equipment). Vapors are heavier than air and may accumulate in low areas. Vapors may travel considerable distance to a source of ignition where they can ignite, flashback or explode. May create vapor/air explosion hazard indoors, outdoors or in sewers. If container is not properly cooled, it can explode in the heat of a fire.

SECTION VI - ACCIDENTAL RELEASE MEASURES

- Personal Precautions:** Keep all sources of ignition and hot metal surfaces away from spill or release.
Evacuate all unprotected personnel from the area.
- Environmental Precautions:** Contain spill if it can be done with minimal risk. Prevent liquid from entering drains, sewers or waterways. Notify proper authorities.
- Methods for Cleaning Up:** Use foam on spills to minimize vapors.
Using only non-sparking tools and explosion proof equipment, collect spill on absorbent material and put into approved container.

SECTION VII - HANDLING AND STORAGE

- Handling and Storage:**
- NFPA Class I storage.
 - Vent container carefully before opening.
 - Bond and ground all equipment when transferring from one vessel to another. The use of explosion-proof equipment is recommended.
 - "Empty" containers retain residue and/or vapor and may be dangerous. Do not cut, weld, braze solder, drill, grind or expose such containers to heat, flames, sparks, or other ignition sources.
 - Keep containers tightly closed when not in use.

Safety Data Sheet
Isopropyl Alcohol, 70%

- Avoid prolonged breathing of mist or vapor. Wash thoroughly after handling.

SECTION VIII - PRECAUTIONS TO CONTROL EXPOSURE / PERSONAL PROTECTION

EXPOSURE LIMITS:

Component Name	CAS #	OSHA PEL	ACGIH TLV
Isopropyl Alcohol	67-63-0	400 ppm	200ppm (TWA)
Water	7732-18-5	Not Established	Not Established

Engineering Controls: Adequate local or mechanical to reduce vapor or mist to below the PEL or TLV.

Monitoring: Wash hands prior to eating, drinking or using the restroom.
Follow accepted work practices for handling a flammable material. Do not eat, drink or smoke in areas where this chemical is used or stored. Have eye wash stations and safety showers readily available.

Personal Protective Equipment (PPE)

Eye Protection: Goggles or approved OSHA device with side shields; do not wear contact lenses when handling this product.

Skin Protection: Impervious solvent resistant gloves.
Impervious apron and work boots recommend where splashing may occur.

Respiratory Protection: Use the proper respirator in areas where the chemical exposure is unknown or above the OSHA PEL or ACGIH TLV.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Clear, Colorless Liquid
Odor	Strong Alcohol Odor
pH@25°C	No data available
Melting/Freezing Point	No data available
Flashpoint	55°F. TCC
Specific Gravity	0.787
Solubility	Complete
Auto-Ignition Temperature	No data available
Decomposition Temperature	No data available
VOC Content	65% (4.6#/gal)
Odor Threshold	No data available
Boiling Range	180°F
Evaporation Point	2.8 (Butyl Acetate=1)
Flammable Limits - Upper	8.2%
Flammable Limits - Lower	1.3%
Vapor Pressure	27.5 mmHg @ 20°C
Vapor Density (Air=1)	1.4 (Air=1)
Viscosity	No data available

Safety Data Sheet
Isopropyl Alcohol, 70%

SECTION X - STABILITY AND REACTIVITY

Stability: Stable, under normal conditions of storage and handling.

Conditions to Avoid: Extreme heat and ignition sources.

Hazardous Decomposition/Byproducts: CO, CO₂, and various hydrocarbons under combustion conditions.

Hazardous Polymerization: Will not occur.

Polymerization Conditions to Avoid: None

Incompatibilities: Strong Oxidizers and Alkali Metals

SECTION XI - TOXICOLOGICAL INFORMATION

Likely Route of Exposure: Contact and inhalation; ingestion possible.

Inhalation: May cause irritation to the upper respiratory tract and CNS depression.

Eye Contact: Causes eye irritation including stinging, watering and redness which may result in corneal injury.

Skin Contact: Contact may cause mild skin irritation including redness, burning and drying/cracking of the skin.
No harmful effects from skin adsorption are expected.

Ingestion: Aspiration hazard. Can enter the lungs during swallowing or vomiting and cause chemical pneumonia and edema.

Acute Toxicity Value: See Health Hazards below.

Chronic (Long Term) Effects: See Health Hazards above.

Toxicity:

Component Name	LD50	LC50
Isopropyl Alcohol	Oral - Rat - 5,045 mg/kg - Dermal - Rabbit - 12,800 mg/kg	Inhalation - Rat - 8 h - 16000 ppm
Water	Not Established	Not Established

Safety Data Sheet
Isopropyl Alcohol, 70%

Reproductive Effects	Not Applicable
Teratogenicity	Not Applicable
Mutagenicity	Not Applicable
Embryotoxicity	Not Applicable
Sensitization to Product	Not Applicable
Synergistic Products	Not Applicable
Carcinogenicity	Not Listed as a Carcinogen

SECTION XII - ECOLOGICAL INFORMATION

Ecotoxicity: Information not available.

Mobility: Information not available.

Degradability: Information not available.

BioAccumulation: Information not available.

SECTION XIII - WASTE DISPOSAL CONSIDERATIONS

Follow Federal, State and local regulations.

SECTION XIV - TRANSPORT INFORMATION

DOT SHIPPING INFORMATION

Proper Shipping Name: Isopropyl Alcohol

Contains:

Hazard Class and Label: 3

Identification Number: UN 1219

Packaging Group: II

Other Shipping Info:

Safety Data Sheet
Isopropyl Alcohol, 70%

SECTION XV - REGULATORY INFORMATION

TSCA STATUS:..... The components of this product are listed on the TSCA Inventory

SARA TITLE III SECTION 302/304 EXTREMELY HAZARDOUS SUBSTANCE:

No chemicals in this material are subject to the reporting requirements.

SARA TITLE III SECTION 311/312 HAZARD CATEGORIZATION:

Acute	Chronic	Fire	Pressure	Reactive
X		X		

SARA TITLE III SECTION 313 SUPPLIER INFORMATION:

No chemicals in this material are subject to the reporting requirements.

CERCLA SECTION 102(a) HAZARDOUS SUBSTANCE:

No chemicals in this material are subject to the reporting requirements.

CALIFORNIA PROPOSITION 65:

No chemicals in this material are subject to the reporting requirements.

SECTION XVI - OTHER INFORMATION

HMIS Health: 1

HMIS Flammability: 3

HMIS Reactivity: 0

Additional:

