



MATERIAL SAFETY DATA SHEET

DAEHEUNG CHEMICAL CO., LTD. www.dhcbond.com



Product Name	DE-101(A)
--------------	-----------

1. Product and Company Identification

- A. Product Name DE-101(A)
- B. Recommended use of the chemical and restrictions on use
- Recommended use of the chemical Bond the Metal, wood, glass, plastics etc.
 - Restrictions on use of the product Hazardous material
- C. Manufacturer/Supplier/Distributor Information
- Name DAEHEUNG CHEMICAL CO., LTD.
 - Address 68, Sandan-ro 64beon-gil, Pyeongtaek-si, Gyeonggi-do, Korea
 - Emergency phone number 82-31-668-1424

2. Hazards identification

- A. Human health hazards
- Skin corrosion / irritation: Category 2
- Serious eye damage / eye irritation: Category 2
- Skin sensitization: Category 1
- Chronic aquatic environment hazards: Category 2

B. Environmental hazards

C. Label elements including precautionary statements

- Symbol



- Signal Word warning
- Hazard-Risk Statement
- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H411 Toxic to aquatic life with long-lasting effects

- Precautionary Statement
- Prevention

P261 Avoid breathing dust/fumes/gas/mist/vapours/spray.

P264 Wash thoroughly after handling.

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response

P302+P352 IF ON SKIN: Wash with plenty of water/soap

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.

P321 Specific treatment

P332+P313 If skin irritation occurs: Get medical advice/attention.

P333+P313 If skin irritation or a rash occurs: Get medical advice/attention.

P337+P313 If eye irritation persists get medical advice/attention.

P362+P364 Take off contaminated clothing and wash it before reuse.

P391 Collect spillage.

Storage

No data available

Disposal

P501 Dispose of contents/container in accordance with local/regional/national/international regulation

3. Composition/Information on ingredients

Chemical Name	Other name	CAS number	Content(%)
DE-101(A) : Resin			
Epoxy Resin	–	25068–38–6	100

4. First aid measures

A. Eye contact	If it gets on your eyes, wash it carefully with water for a few minutes. Remove contact lenses if possible. Keep washing. If irritation persists, seek medical attention / advice.
B. Skin contact	If skin irritation or erythema appears, seek medical attention / advice. Take off contaminated clothing and wash before reuse. For hot materials, soak or wash affected areas with plenty of cold water to dissipate heat. Get urgent medical attention Remove contaminated clothing and shoes and isolate contaminated areas Immediately wash skin and eyes with running water for more than 20 minutes upon contact with material. Prevent the spread of contaminated areas in case of minor skin contact
C. Inhalation	Move to fresh air If not breathing, give artificial respiration Provide oxygen if breathing is difficult Get urgent medical attention
D. Ingestion	Get urgent medical attention
E. Indication of immediate medical attention and notes for physician	Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. Fire-Fighting measures

A. Suitable (and unsuitable) extinguishing media	Use alcohol foam, carbon dioxide, or water spray for digestion related to this material. Use dry sand or soil for suffocation.
B. Specific hazards arising from the chemical (e.g. nature of any hazardous combustion products)	During burning, irritating and very toxic gases may be generated by pyrolysis or combustion Containers may explode when heated Some can burn, but do not ignite easily May cause skin and eye burns on contact In case of fire, irritating and toxic gases may be generated Inhalation of material can be harmful Inhalation of asbestos can damage the lungs Some liquids may produce vapors that cause dizziness and suffocation
C. Special protective equipment and precautions for fire-fighters	Rescuers should wear appropriate protection. Extinguish the area by maintaining a safe distance Please note that some may be transported at high temperatures. Dig and hold the ditch for disposal of digestion water so that the material does not scatter. Move containers from fire area if it is not dangerous. Cool the container with plenty of water after the fire has extinguished in the event of a tank fire. In the event of a tank fire, immediately withdraw if there is a high tone or discoloration of the pressure release device.

In the event of a tank fire, step back from the tank in flames.

6. Accidental release measures	
A. Personal precautions, protective equipment and emergency procedures	Avoid inhalation of dust, fume, gas, mist, steam and spray. Immediately wipe spills and follow the precautions in the protective equipment section. Do not touch or walk through the exposed material Eliminate all ignition sources Stop leak if not dangerous Prevent dust formation Pay attention to materials and conditions to avoid
B. Environmental precautions and protective procedures	Do not discharge into the environment. Leaks can cause contamination Prevent entry into waterways, sewers, basements or confined spaces
C. Methods and materials for containment and cleaning up	Absorb spills with inert materials (eg dry sand or soil) and place in chemical waste containers. Absorb liquid and wash contaminated areas with detergent and water. If there is a large amount of leakage, make a ditch away from the liquid leakage. Place the spilled material in a clean, dry container with a clean shovel, loosely close the container, and remove the container from the leaked area. In case of powder leakage, cover it with a plastic sheet to prevent diffusion and keep it dry For small spills, absorb with sand, non-combustible material and place in container. Collect spillage.
7. Handling and storage	
A. Precautions for safe handling	Avoid inhalation of dust, fume, gas, mist, steam and spray. Wash thoroughly after handling. Do not bring contaminated clothing out of the workplace. Product residue may remain after the container is emptied. Follow all MSDS / label precautions. Avoid prolonged or persistent skin contact. Pay attention to materials and conditions to avoid Work with engineering management and personal protective equipment Beware of high temperatures
B. Conditions for safe storage (including any incompatibilities)	Empty drums should be completely drained and properly blocked to immediately return them to the drum adjuster or place them properly. Pay attention to materials and conditions to avoid
8. Exposure controls & personal protection	
A. Control parameters (e.g. occupational exposure limit values, biological limit values)	
- Occupational exposure limit values	No data available
- ACGIH limit values	No data available
- Biological limit values	No data available
B. Appropriate engineering controls	For facilities that store or use this material, install face wash facilities and safety showers.
C. Personal protective equipment	

– Respiratory protection	Wear a respirator that is certified by the Korea Occupational Safety and Health Agency for the gas / liquid physicochemical properties being exposed.
	For gas / liquid materials, the following respiratory protection is recommended: –Isolated front type gas mask (for organic compounds (for acid gas)) or sequestered type separate gas mask (for organic compounds (for acid gas for acid gas)) or direct type front gas mask (For organic compounds (for acid gases for acid gases) or for anti–gas masks (for organic compounds (for acid gases for acid gases)) or electric gas masks
– Eye protection	If oxygen is insufficient (<19.5%), wear a breathing mask or self–contained breathing apparatus Wear eye protection or breathable safety goggles to protect your eyes from vaporous organic substances that can cause eye irritation or other health hazards. Install emergency washing facilities (shower type) and face–wash facilities in a location easily accessible by workers.
– Hands protection	Wear protective gloves of appropriate material considering the physical and chemical properties of chemicals.
– Body protection	Wear protective clothing of the appropriate material considering the physical and chemical properties of the chemical.

9. Physical and chemical properties		
A. Appearance		
Physical state		liquid
Color		colorless ~ yellow
B. Odour		
C. Odour threshold		
D. pH		
E. Melting point/freezing point		
F. Initial boiling point and boiling range		
G. Flashing point		
H. Evaporation rate		
I. Flammability(solid, gas)		
J. Upper/lower flammability or explosive limits		
K. Vapor pressure		
L. Solubility		
M. Vapor density		
N. Relative density		
O. Partition coefficient:n–octanol/water		
P. Auto–ignition temperature		
Q. Decomposition temperature		
R. Viscosity		
S. Formula mass		

10. Stability and reactivity	
A.Chemical stability and possibility of hazardous reactions	Containers may explode when heated Some can burn, but do not ignite easily May cause skin and eye burns on contact In case of fire, irritating and toxic gases may be generated Inhalation of material can be harmful Inhalation of asbestos can damage the lungs

	Some liquids may produce vapors that cause dizziness and suffocation
B. Conditions to avoid	Heat
C. Incompatible materials	No data available
D. Hazardous decomposition products	During burning, irritating and very toxic gases may be generated by pyrolysis or combustion Irritant, toxic gas

11. Toxicological information

A. Information on the likely routes of exposure	No data available
B. Health hazards information	
- Acute toxic	
Oral	LD50 > 1000 mg/kg Rat
Dermal	LD50 > 20000 mg/kg Rabbit
Inhalation	No data available
- Skin corrosive/irritant	-Has irritation to rabbit skin (CERI Hazard data 2002) -Classification of Annex 1 to the 7th Amendment to the European Union Directive is R38 (irritating to skin). -The rabbit's STANDARD DRAIZE TEST showed a moderate or higher stimulus
- Serious eye damage/eye irritation	-Has rabbit eye irritation (CERI Hazard data 2002) -The rabbit's STANDARD DRAIZE TEST showed a moderate or higher stimulus
- Respiratory sensitization	No data available
- Skin sensitization	-Classification of Annex 1 to the 7th Amendment to the European Union Directive is R43 (may cause hypersensitivity by skin contact)
- Carcinogenicity	
IARC	No data available
OSHA	No data available
ACGIH	No data available
NTP	No data available
EU CLP	No data available
- Germ Cell Mutagenicity	-In vitro CHL cells, positive in salt biopsy without metabolic activation, negative in metabolic activation test. -Positive in Salmonella typhimurium test
- Reproductive toxicity	No data available
- Specific target organ toxicity (single exposure)	No data available
- Specific target organ toxicity (repeated exposure)	No data available
- Aspiration hazard	No data available

12. Ecological information

A. Aquatic and terrestrial ecotoxicity	
- Fish	LC50 1.41 mg/l 96 hr Oryzias latipes
- Shellfish	EC50 1.7 mg/l 48 hr
- Birds	No data available
B. Persistence and degradability	
- Persistence	log Kow 2.821 (estimate)
- Resolvability	No data available
C. Bioaccumulative potential	
- Concentration	BCF 0.56 ~ 0.67 (Exposure concentration: 10 ug / l, 5.6 <= BCF = <6.8 (exposure concentration: 1 ug / l))

– Bio resolvability	0 (%) 28 day
D. Mobility in soil	No data available
E. Other adverse effects	No data available

13. Disposal considerations

A. Disposal method	If specified in the Waste Management Act, dispose of contents and container according to the regulations.
B. Disposal precaution	Dispose of the contents container (according to the provisions in the relevant regulations).

14. Transport information

A. UN number	1133
B. UN proper shipping name	ADHESIVES(Containing a flammable liquid)
C. Transport hazard class	3
D. Packing group (if applicable)	III
E. Marin pollution (yes/no)	Yes (BISPHENOL A–EPICHLOROHYDRIN RESIN)
F. Special precaution which a user to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises	
– Emergency procedure at fire	F–A
– Emergency procedure at leakages	S–F

15. Regulatory information

A. Industrial Safety and Health Act	No data available
B. Toxic Chemical Control Act	No data available
C. Dangerous Material Safety Control Act	No data available
D. Wastes Management Act	No data available
E. Other requirements in domestic and other countries	

– Domestic regulation	
Persistent Organic Pollutant Control Act	No data available

– Other countries	
USA(OSHA)	No data available
USA(CERCLA)	No data available
USA(EPCRA 302)	No data available
USA(EPCRA 304)	No data available
USA(EPCRA 313)	No data available
USA (Rotterdam Convention material)	No data available
USA (Stockholm Convention material)	No data available
USA (Substance Montreal Protocol)	No data available

EU (Classification)	Xi: R36/38R43N: R51–53
EU (Risk Phrases)	R36/38, R43, R51/53
EU (Safety Phrases)	S2, S28, S37/39, S61

16. Other information

A. Uses and restrictions	Automotive coating (electrodeposition). Building and civil engineering industries (floorings, adhesives, mortars, grouts). Filament winding for composites. Electrical and electronics industries (potting, casting, encapsulating etc). Solvent free and high solid coatings.
B. MSDS distribution	It is recommended that the handling and safety information presented in this data sheet be passed on, in an appropriate format, to your customers and handlers.
C. Issuing date	June 5, 2000
D. Revision number and date	4 / May 31, 2022



MATERIAL SAFETY DATA SHEET

DAEHEUNG CHEMICAL CO., LTD. www.dhcbond.com



Product Name	DE-101(B)
--------------	-----------

1. Product and Company Identification

- A. Product NameDE-101(B)
- B. Recommended use of the chemical and restrictions on use
 - Recommended use of the chemicalBond the Metal, wood, glass, plastics etc.
 - Restrictions on use of the productHazardous material
- C. Manufacturer/Supplier/Distributor Information
 - NameDAEHEUNG CHEMICAL CO., LTD.
 - Address68, Sandan-ro 64beon-gil, Pyeongtaek-si, Gyeonggi-do, Korea
 - Emergency phone number82-31-668-1424

2. Hazards identification

- A. Human health hazards
 - Acute toxicity (oral): Category 4
 - Acute toxicity (dermal): Category 3
 - Acute toxicity (inhalation: vapor): Category 1
 - Acute toxicity (inhalation: dust / mist): Category 2
 - Skin corrosion / irritation: Category 1
 - Serious eye damage / eye irritation: Category 1
 - Skin sensitization: Category 1
 - Germ cell mutagenicity: Category 2
 - Specific target organ toxicity (single exposure): Category 3 (respiratory system stimulation)
 - Specific target organ toxicity (repeated exposure): Category 2
 - Chronic aquatic environment hazards: Category 2
- B. Environmental hazards
- C. Label elements including precautionary statements
 - Symbol
 - Signal WordDanger
 - Hazard-Risk Statement
 - H302 Harmful if swallowed
 - H311 Toxic in contact with skin
 - H314 Causes severe skin burns and eye damage
 - H317 May cause an allergic skin reaction
 - H318 Causes serious eye damage
 - H330 Fatal if inhaled
 - H335 May cause respiratory irritation
 - H341 Suspected of causing genetic defects
 - H373 May cause damage to organs through prolonged or repeated exposure
 - H411 Toxic to aquatic life with long-lasting effects
 - Precautionary Statement

Prevention	P201	Obtain special instructions before use.
	P202	Do not handle until all safety precautions have been read and understood.
	P260	Do not breathe dust/fumes/gas/mist/vapours/spray.
	P261	Avoid breathing dust/fumes/gas/mist/vapours/spray
	P264	Wash thoroughly after handling.
	P270	Do not eat, drink or smoke when using this product.
	P271	Use only outdoors or in a well-ventilated area.
	P272	Contaminated work clothing should not be allowed out of the workplace.
	P273	Avoid release to the environment.
	P280	Wear protective gloves/protective clothing/eye protection/face protection.
	P301+P312	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
	P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
	P302+P352	IF ON SKIN: Wash with plenty of water/soap
	P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
	P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
	P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.
	P308+P313	If exposed: Call a POISON CENTER or doctor/physician.
	P310	Immediately call a POISON CENTER/doctor
	P312	Call a POISON CENTER/ doctor if you feel unwell.
	P314	Get medical advice/attention if you feel unwell.
Storage	P320	Specific treatment is urgent
	P321	Specific treatment
	P330	Rinse mouth.
	P333+P313	If skin irritation or a rash occurs: Get medical advice/attention.
	P361+P364	Take off immediately all contaminated clothing and wash it before reuse.
	P362+P364	Take off contaminated clothing and wash it before reuse.
	P363	Wash contaminated clothing before reuse.
	P391	Collect spillage.
	P403+P233	Store in a well ventilated place. Keep container tightly closed.
	P405	Store locked up.
Disposal	P501	Dispose of contents/container in accordance with local/regional/national/international regulation

3. Composition/Information on ingredients			
Chemical Name	Other name	CAS number	Content(%)
DE-101(B) : Hardener			
Benzyl Alcohol	BENZENEMETHANOL	100-51-6	10~15
Phenol	phenol-Skin	108-95-2	20~40
Epichlorohydrin-bisphenol A resin	BISPHENOL A-EPICHLOROHYDRIN RESIN	25068-38-6	5~10
C18-UNSATURATED FATTY ACIDS	FATTY acids	68410-23-1	30~50
2,4,6-tris(dimethylaminomethyl)phenol	2,4,6-RIS((DIMETHYLAMINO)METHYL)PHENOL(DMP-30)	90-72-2	5~10

4. First aid measures

A. Eye contact	If it gets on your eyes, wash it carefully with water for a few minutes. Remove contact lenses if possible. Keep washing. If irritation persists, seek medical attention / advice.
B. Skin contact	If on skin (or hair), remove all contaminated clothing. Wash skin with water. Take a shower. If skin irritation or erythema appears, seek medical attention / advice. Wash contaminated clothing before reuse. For hot materials, soak or wash affected areas with plenty of cold water to dissipate heat. Remove contaminated clothing and shoes and isolate contaminated areas. Prevent the spread of contaminated areas in case of minor skin contact.
C. Inhalation	Seek medical attention immediately. If exposed to excessive dust or fume, remove with clean air and cough or If you have other symptoms, take medical attention.
D. Ingestion	If swallowed, wash mouth. Do not try to vomit. If exposed or concerned, seek medical attention / advice. In case of ingestion or inhalation of substances, do not perform artificial respiration by oral-to-oral method and use appropriate respiratory medical equipment.
E. Indication of immediate medical attention and notes for physician	In case of exposure, contact the medical staff and take special emergency measures such as follow-up. Make sure that medical personnel are aware of the substance and take protective measures.

5. Fire-Fighting measures

A. Suitable (and unsuitable) extinguishing media	Use alcohol foam, carbon dioxide, or water spray for digestion related to this material. Use dry sand or soil for suffocation.
B. Specific hazards arising from the chemical (e.g. nature of any hazardous combustion products)	During burning, irritating and very toxic gases may be generated by pyrolysis or combustion. Containers may explode when heated.

C. Special protective equipment and precautions for fire-fighters

Some can burn, but do not ignite easily

Non-flammable, the material itself does not burn, but may decompose upon heating to generate corrosive / toxic fumes

Rescuers should wear appropriate protection.

Extinguish the area by maintaining a safe distance

May be melted and transported

Dig and hold the ditch for disposal of digestion water so that the material does not scatter.

Move containers from fire area if it is not dangerous.

Do not let water get inside the container

Cool the container with plenty of water after the fire has extinguished in the event of a tank fire.

In the event of a tank fire, withdraw immediately if there is a high pitch or discoloration in the pressure relief device.

In the event of a tank fire, immediately withdraw if there is a high tone or discoloration of the pressure release device.

In the event of a tank fire, step back from the tank in flames.

In the event of a tank fire, use unmanned fire extinguishing equipment in the event of a large fire and, if not possible, withdraw and let it burn.

6. Accidental release measures

A. Personal precautions, protective equipment and emergency procedures

Avoid inhalation of dust, fume, gas, mist, steam and spray.

Immediately wipe spills and follow the precautions in the protective equipment section.

Eliminate all ignition sources

Stop leak if not dangerous

Do not touch damaged containers or leaks without wearing appropriate protective clothing.

Cover with plastic sheet to prevent spreading

Prevent dust formation

Pay attention to materials and conditions to avoid

B. Environmental precautions and protective procedures

Do not discharge into the environment.

Prevent entry into waterways, sewers, basements or confined spaces

C. Methods and materials for containment and cleaning up

Absorb spills with inert materials (eg dry sand or soil) and place in chemical waste containers.

Remove airborne dust and moisten with water to prevent scattering.

Absorb liquid and wash contaminated areas with detergent and water.

If there is a large amount of leakage, make a ditch away from the liquid leakage.

Place the spilled material in a clean, dry container with a clean shovel, loosely

In case of powder leakage, cover it with a plastic sheet to prevent diffusion and

For small spills, absorb with sand, non-combustible material and place in

Collect spillage.

7. Handling and storage

A. Precautions for safe handling

Do not handle until all safety precautions have been read and understood.

Avoid inhalation of dust, fume, gas, mist, steam and spray.

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Handle only outdoors or in a well-ventilated area.

Do not bring contaminated clothing out of the workplace.

Product residue may remain after the container is emptied.

Follow all MSDS / label precautions.

Use with care and storage.

Open the cap carefully before opening.

	Avoid prolonged or persistent skin contact.
	Pay attention to materials and conditions to avoid
	Work with engineering management and personal protective equipment
	Beware of high temperatures
B. Conditions for safe storage (including any incompatibilities)	Empty drums should be completely drained and properly blocked to immediately return them to the drum adjuster or place them properly.
	Keep container tightly closed in a well-ventilated place.
	Pay attention to materials and conditions to avoid

8. Exposure controls & personal protection

A. Control parameters (e.g. occupational exposure limit values, biological limit values)	
– Occupational exposure limit values	
BENZYL ALCOHOL	No data available
PHENOL RESIN	TWA – 5ppm
BISPHENOL A–	No data available
EPICHLOROHYDRIN RESIN	
C18–UNSATURATED FATTY	No data available
ACIDS	
2,4,6–	No data available
TRIS((DIMETHYLAMINO)METHYL)PHENOL	
– ACGIH limit values	
BENZYL ALCOHOL	No data available
PHENOL RESIN	TWA – 5ppm
BISPHENOL A–	No data available
EPICHLOROHYDRIN RESIN	
C18–UNSATURATED FATTY	No data available
ACIDS	
2,4,6–	No data available
TRIS((DIMETHYLAMINO)METHYL)PHENOL	
– Biological limit values	
BENZYL ALCOHOL	No data available
PHENOL RESIN	No data available
BISPHENOL A–	No data available
EPICHLOROHYDRIN RESIN	
C18–UNSATURATED FATTY	No data available
ACIDS	
2,4,6–	No data available
TRIS((DIMETHYLAMINO)METHYL)PHENOL	
B. Appropriate engineering controls	Use process isolation, local exhaust, or other engineering controls to control air levels below exposure limits.
	If driving generates dust, fume or mist, ventilate to keep air pollution below the exposure limit.
	For facilities that store or use this material, install face wash facilities and safety showers.
C. Personal protective equipment	
– Respiratory protection	
	Wear a respirator that is certified by the Korea Occupational Safety and Health Agency for the gas / liquid physicochemical properties being exposed.
– Eye protection	
	Wear eye protection or breathable safety goggles to protect your eyes from vaporous organic substances that can cause eye irritation or other health hazards.
	Install emergency washing facilities (shower type) and face-wash facilities in a location easily accessible by workers.
– Hands protection	
	Wear protective gloves of appropriate material considering the physical and chemical properties of chemicals.
– Body protection	
	Wear protective clothing of the appropriate material considering the physical and chemical properties of the chemical.

9. Physical and chemical properties

A. Appearance

Physical state	liquid
Color	Brown
B. Odour	Aromatic smell
C. Odour threshold	No data available
D. pH	No data available
E. Melting point/freezing point	No data available
F. Initial boiling point and boiling range	No data available
G. Flashing point	200 °C
H. Evaporation rate	No data available
I. Flammability(solid, gas)	No data available
J. Upper/lower flammability or explosive limits	No data available
K. Vapor pressure	No data available
L. Solubility	No data available
M. Vapor density	No data available
N. Relative density	1.2±1
O. Partition coefficient:n-octanol/water	No data available
P. Auto-ignition temperature	No data available
Q. Decomposition temperature	No data available
R. Viscosity	6,400±100cps (at 20°C, RION VT-04)
S. Formula mass	No data available

10. Stability and reactivity

A.Chemical stability and possibility of hazardous reactions	It can decompose at high temperature and generate toxic gas Violent polymerization may cause fire and explosion May form an explosive mixture at or above the flash point Containers may explode when heated Highly flammable: easily ignited by heat, sparks and flames Leaks may be a fire / explosion hazard May cause skin and eye burns on contact Risk of steam explosion indoors, outdoors, and sewers Contact with molten material can cause serious burns to skin and eyes Vapors can form explosive mixtures with air
B. Conditions to avoid	Keep away from heat, sparks, flames and high heat.
C. Incompatible materials	Combustible material, reducing material
D. Hazardous decomposition products	Corrosive / toxic fume Irritant, toxic gas

11. Toxicological information

A. Information on the likely routes of exposure	Irritation, blood pressure change, nausea, vomiting, diarrhea, stomach pain, difficulty breathing, headache, drowsiness, dizziness, adjustment (function) May cause loss, cramping, and unconsciousness. May cause irritation, blurred vision and eye damage. Substances that can be absorbed into the mucous membrane, eyes and skin and cause systemic effects (ACGIH, Employment Notice No. 2018-24; skin) May irritate the respiratory system May irritate the skin May irritate the eyes
B. Health hazards information	
- Acute toxic	
Oral	
BENZYL ALCOHOL	LD50 1230 mg/kg Rat
PHENOL RESIN	LD50 650 mg/kg Rat (OECD TG 401)
BISPHENOL A- EPICHLOROHYDRIN RESIN	LD50 > 1000 mg/kg Rat

ACIDS	C18-UNSATURATED FATTY	No data available
	2,4,6-	LD50 1200 mg/kg Rat
TRIS((DIMETHYLAMINO)METHYL)PHENOL	Dermal	
	BENZYL ALCOHOL	LD50 2000 mg/kg Rabbit
	PHENOL RESIN	LD50 625 mg/kg Rat (OECD TG 402)
	BISPHENOL A-	LD50 > 20000 mg/kg Rabbit
EPICHLOROHYDRIN RESIN		
ACIDS	C18-UNSATURATED FATTY	No data available
	2,4,6-	LD50 1280 mg/kg Rat
TRIS((DIMETHYLAMINO)METHYL)PHENOL	Inhalation	
	BENZYL ALCOHOL	Vapor LC50> 4.178 mg/ℓ 4 hr Rat (OECD 403 GLP)
	PHENOL RESIN	Dust LC50 1.27 mg/ℓ 4 hr Rat (LC0(8h) =900mg/m³ air (nominal) (OECD Guideline 403))
	BISPHENOL A-	No data available
EPICHLOROHYDRIN RESIN		
ACIDS	C18-UNSATURATED FATTY	No data available
	2,4,6-	No data available
TRIS((DIMETHYLAMINO)METHYL)PHENOL	- Skin corrosive/irritant	
	BENZYL ALCOHOL	No skin irritation (Observation score: 0-1, edema score: 0) _Reliability 1 (OECD Guideline 404, GLP) for 7 days after 4 hours exposure to 500 ul of rabbit skin
	PHENOL RESIN	In vitro skin corrosion / irritation test results, corrosive OECD TG 431, GLP
	BISPHENOL A-	-Has irritation to rabbit skin (CERI Hazard data 2002)
EPICHLOROHYDRIN RESIN		-Classification of Annex 1 to the 7th Amendment to the European Union Directive is R38 (irritating to skin). -The rabbit's STANDARD DRAIZE TEST showed a moderate or higher stimulus
ACIDS	C18-UNSATURATED FATTY	Causes skin irritation
	2,4,6-	Severe irritation
TRIS((DIMETHYLAMINO)METHYL)PHENOL	- Serious eye damage/eye irritation	
	BENZYL ALCOHOL	Some eye irritation (Rabbit) OECD TG 405
	PHENOL RESIN	Severe eye damage / irritation test in rabbits, corrosive to eyes Overall irritation index: 105/110 OECD TG 405, GLP
	BISPHENOL A-	-Has rabbit eye irritation (CERI Hazard data 2002)
EPICHLOROHYDRIN RESIN		-The rabbit's STANDARD DRAIZE TEST showed a moderate or higher stimulus
ACIDS	C18-UNSATURATED FATTY	Eye irritation
	2,4,6-	Severe irritation
TRIS((DIMETHYLAMINO)METHYL)PHENOL	- Respiratory sensitization	
	BENZYL ALCOHOL	No data available
	PHENOL RESIN	No data available
	BISPHENOL A-	No data available
EPICHLOROHYDRIN RESIN		
ACIDS	C18-UNSATURATED FATTY	No data available
	2,4,6-	No data available
TRIS((DIMETHYLAMINO)METHYL)PHENOL	- Skin sensitization	
	BENZYL ALCOHOL	Skin sensitization (Sensitive skin test results using the human body as a test method for patch test)
	PHENOL RESIN	Skin sensitization test for guinea pigs, does not cause sensitization OECD TG 406, GLP

BISPHENOL A- EPICHLOROHYDRIN RESIN	-Classification of Annex 1 to the 7th Amendment to the European Union Directive is R43 (may cause hypersensitivity by skin contact)
C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL	No data available
- Carcinogenicity IARC	
BENZYL ALCOHOL	No data available
PHENOL RESIN	3
BISPHENOL A- EPICHLOROHYDRIN RESIN	No data available
C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL	No data available
OSHA	No data available
ACGIH	
BENZYL ALCOHOL	No data available
PHENOL RESIN	A4
BISPHENOL A- EPICHLOROHYDRIN RESIN	No data available
C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL	No data available
NTP	No data available
EU CLP	No data available
- Germ Cell Mutagenicity	
BENZYL ALCOHOL	No data available
PHENOL RESIN	As a result of chromosomal abnormality test using mammalian cultured cells, it has a positive metabolic activity. OECD Guideline 473 Micronucleus test results using mammalian red blood cells in vivo, positive OECD Guideline 474
BISPHENOL A- EPICHLOROHYDRIN RESIN	-In vitro CHL cells, positive in salt biopsy without metabolic activation, negative in metabolic activation test. -Positive in Salmonella typhimurium test
C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL	No data available
- Reproductive toxicity	
BENZYL ALCOHOL	No adverse effects of benzyl alcohol were found in chronic exposure animal studies using rats and mice, and although there was a difference between the benzyl alcohol treatment group and the control group in the reproductive toxicity test using mice, it had a low pregnancy weight and reduced mean three-fold body weight. It was limited to. Some studies reported that fetal weight was reduced compared to the control group, and there was also a study showing that there was no difference between the control group and the benzyl alcohol treatment group. In addition, when mice were orally administered 6 g / kg of benzyl alcohol from 6 to 13 days after pregnancy, there was a statistically significant effect on the growth of tea workers.

PHENOL RESIN	As a result of the 2nd generation reproductive toxicity test in rats, the vesicle weight of the P1 generation male subjects was significantly reduced in the high concentration group, and the adrenal, brain, spleen, and ovarian weight loss of the female subjects was observed, and the weight / water / feeding intake / Fetal survival rate decreases, delayed sexual maturity decrease NOAEL P & F1 & F2 = 1 000 mg / L drinking water OECD TG 416, GLP Results of fetal development toxicity test in rats showed a decrease in maternal weight gain, delayed fetal growth, excessive salivation and dyspnea in the 360 mg / kg concentration group. Other symptoms include lesions, swollen feet, and occupancy. Lower hair loss of the above substance, limbs or back is observed NOAECmaternal toxicity = 60 mg / kg bw / day, NOAELdevelopmental toxicity = 120 mg / kg bw / day GLP, OECD Guideline 414
BISPHENOL A- EPICHLOROHYDRIN RESIN	No data available
C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL - Specific target organ toxicity (single exposure)	No data available
BENZYL ALCOHOL	No data available
PHENOL RESIN	Acute toxicity test using test animals showed severe depression, central nervous system irritation, paralysis, and bronchial pneumonia.
BISPHENOL A- EPICHLOROHYDRIN RESIN	No data available
C18-UNSATURATED FATTY ACIDS	Stimulates airways when inhaled
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL - Specific target organ toxicity (repeated exposure)	Severely irritates the airways when inhaled
BENZYL ALCOHOL	No data available
PHENOL RESIN	Repeated dosing of rodents in rats 90-day oral toxicity test showed red and discolored nose and eyes around the nose and eyes, wet groin hair, water intake at high concentrations, food intake, weight loss, and seminal vesicles in high concentrations of P1 male subjects Reduction in absolute weight, organ brain, kidney, liver, testis, epididymis, and right testicle parenchyma-weight ratio significantly increased, indicating a significant decrease in final weight NOAEL number = 1000ppm GLP, OECD Guideline 408 Repeated dose percutaneous toxicity studies in rats showed mild tremors, systemic effects, skin corneal hypertrophy, bleeding along the destroyed skin, and severe local changes and severe to moderate severity in individuals exposed to high concentrations. Symptoms Whole body toxicity is observed NOAELsystemic effects = 130 mg / kg bw / day Target organ: central nervous system
BISPHENOL A- EPICHLOROHYDRIN RESIN	No data available
C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL - Aspiration hazard	No data available

12. Ecological information	
A. Aquatic and terrestrial ecotoxicity	
- Fish	
BENZYL ALCOHOL	LC50 10 mg/ℓ 96 hr
PHENOL RESIN	LC50 21.93 mg/ℓ 96 hr Poecilia reticulata (GLP, OECD Guideline 204)
BISPHENOL A- EPICHLOROHYDRIN RESIN	LC50 1.41 mg/ℓ 96 hr Oryzias latipes
C18-UNSATURATED FATTY ACIDS	No data available

2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL	LC50 447.821 mg/ℓ 96 hr
- Shellfish	
BENZYL ALCOHOL	No data available
PHENOL RESIN	EC50 3.1 mg/ℓ 48 hr Ceriodaphnia dubia
BISPHENOL A- EPICHLOROHYDRIN RESIN	EC50 1.7 mg/ℓ 48 hr
C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL	LC50 28.198 mg/ℓ 48 hr
- Birds	
BENZYL ALCOHOL	No data available
PHENOL RESIN	EC50 61.1 mg/ℓ 96 hr Selenastrum capricornutum (EPA/600/4-89/001)
BISPHENOL A- ----- C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL	No data available
B. Persistence and degradability	
- Persistence	
BENZYL ALCOHOL	log Kow 1.1
PHENOL RESIN	log Kow 1.47 (20-36.1 °C)
BISPHENOL A- EPICHLOROHYDRIN RESIN	log Kow 2.821 (estimate)
C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL	log Kow 0.77
- Resolvability	No data available
C. Bioaccumulative potential	
- Concentration	
BENZYL ALCOHOL	No data available
PHENOL RESIN	01 17.5 ~ 647 BCF (OECD TG 305E, GLP)
BISPHENOL A- EPICHLOROHYDRIN RESIN	BCF 0.56 ~ 0.67 (exposure concentration: 10 ug / l, 5.6 <= BCF = <6.8 (exposure concentration: 1 ug / l))
C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL	BCF 3.162
- Bio resolvability	
BENZYL ALCOHOL	94 (%) 28 day ((Aerobic, activated sludge))
PHENOL RESIN	62 01 100 hr (OECD TG 301 C)
BISPHENOL A- EPICHLOROHYDRIN RESIN	0 (%) 28 day
C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL	No data available
D. Mobility in soil	
BENZYL ALCOHOL	No data available
PHENOL RESIN	OECD TG 121
BISPHENOL A- EPICHLOROHYDRIN RESIN	No data available
C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL	No data available
E. Other adverse effects	
BENZYL ALCOHOL	No data available
PHENOL RESIN	Fish Cirrhina mrigala : NOEC60d=0.077 mg/L GLP, OECD TG 204

BISPHENOL A- EPICHLOROHYDRIN RESIN	No data available
C18-UNSATURATED FATTY ACIDS	No data available
2,4,6- TRIS((DIMETHYLAMINO)METHYL)PHENOL	No data available

13. Disposal considerations

- A. Disposal method: If specified in the Waste Management Act, dispose of contents and container
- B. Disposal precaution: Dispose of the contents container (according to the provisions in the relevant

14. Transport information

- A. UN number: 1133
- B. UN proper shipping name: ADHESIVES(Containing a flammable liquid)
- C. Transport hazard class: 3
- D. Packing group (if applicable): III
- E. Marin pollution (yes/no): Yes
- F. Special precaution which a user to be aware of or needs to comply with in connection with transport or conveyance either
 - Emergency procedure at fire: F-A
 - Emergency procedure at leakages: S-B

Colorless to yellow liquid or solution. Mixes well with water or dissolves in water. Smells strong. In case of fire, it releases toxic gases.

Corrosion of most metals, especially copper and copper alloys. Reacts violently with acids. Causes burns on skin, eyes and mucous membranes.

15. Regulatory information

- A. Industrial Safety and Health Act
 - BENZYL ALCOHOL: No data available
 - PHENOL RESIN: Hazardous Substances Subject to Management
 - Substances subject to work environment measurement (measurement cycle: 6 months)
 - Special management substances
 - Substances subject to special medical examination (diagnosis cycle: 12 months)
 - Substances with exposure limits
 - BISPHENOL A-
EPICHLOROHYDRIN RESIN: No data available
 - C18-UNSATURATED FATTY
ACIDS: No data available
 - 2,4,6-
TRIS((DIMETHYLAMINO)METHYL)PHENOL: No data available
- B. Toxic Chemical Control Act
 - BENZYL ALCOHOL: No data available
 - PHENOL RESIN: Accident preparedness
 - Poisonous
 - BISPHENOL A-
EPICHLOROHYDRIN RESIN: No data available
 - C18-UNSATURATED FATTY
ACIDS: No data available
 - 2,4,6-
TRIS((DIMETHYLAMINO)METHYL)PHENOL: No data available
- C. Dangerous Material Safety Control Act: Type 4 Third oil (non-aqueous liquid) 2000ℓ
- D. Wastes Management Act: Designated waste
- E. Other requirements in domestic and other countries
 - Domestic regulation
 - Persistent Organic Pollutant Control Act: No data available
 - Other countries
 - USA(OSHA): No data available
 - USA(CERCLA): PHENOL – 453.599 kg 1000 lb

USA(EPCRA 302)	PHENOL – 226.7995/4535.99 kg 500/10000 lb
USA(EPCRA 304)	PHENOL – 453.599 kg 1000 lb
USA(EPCRA 313)	No data available
USA (Rotterdam Convention material)	No data available
USA (Stockholm Convention material)	No data available
USA (Substance Montreal Protocol)	No data available
EU (Classification)	
BENZYL ALCOHOL	Xn; R20/22
PHENOL RESIN	Muta. 2Acute Tox. 3 *Acute Tox. 3 *Acute Tox. 3 *STOT RE 2 *Skin Corr. 1B
BISPHENOL A–	Xi; R36/38R43N; R51–53
EPICHLOROHYDRIN RESIN	
C18–UNSATURATED FATTY	No data available
ACIDS	
2,4,6–	Xn; R22Xi; R36/38
TRIS((DIMETHYLAMINO)METHYL)PHENOL	
EU (Risk Phrases)	
BENZYL ALCOHOL	R20/22
PHENOL RESIN	H341H331H311H301H373 **H314
BISPHENOL A–	R36/38, R43, R51/53
EPICHLOROHYDRIN RESIN	
C18–UNSATURATED FATTY	No data available
ACIDS	
2,4,6–	R22, R36/38
TRIS((DIMETHYLAMINO)METHYL)PHENOL	
EU (Safety Phrases)	
BENZYL ALCOHOL	S2, S26
PHENOL RESIN	S1/2, S24/25, S26, S28, S36/37/39, S45
BISPHENOL A–	S2, S28, S37/39, S61
EPICHLOROHYDRIN RESIN	
C18–UNSATURATED FATTY	No data available
ACIDS	
2,4,6–	S2, S26, S28
TRIS((DIMETHYLAMINO)METHYL)PHENOL	

16. Other information

A. Uses and restrictions	Automotive coating (electrodeposition). Building and civil engineering industries (floorings, adhesives, mortars, grouts). Filament winding for composites. Electrical and electronics industries (potting, casting, encapsulating etc). Solvent free and high solid coatings.
B. MSDS distribution	It is recommended that the handling and safety information presented in this data sheet be passed on, in an appropriate format, to your customers and handlers.
C. Issuing date	June 5, 2000
D. Revision number and date	4 / May 31, 2022