

Material Safety Data Sheet

1. Chemical Product and Company Identification

Trade Name	SM-100B(Hardner)
General Use	Epoxy Molding
Manufacturer	Jeil Chemical Co., Ltd. 38-16, Hoehak 3-gil, Onsan-Eup, Ulju-Gun, Ulsan, South Korea 052-227-5003

2. Hazards Identification

a. Hazards Classification and Statements	Acute. Tox. : Category 4 Skin Irrit. : Category 1 Eye Irrit. : Category 1 Skin Sens. : Category 1 STOT Rep. : Category 1 Aquatic Chronic : Category 1
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b. Hazards Description:

Pictogram



Signal word	DANGER
Hazards Classification and Statements	H302 May be harmful if swallowed H314 Causes severe skin burns and eye damage H317 May cause an allergic skin reaction H318 Causes serious eye damage H330 Fatal if inhaled H370 Causes damage to organs H411 Toxic to aquatic life with long lasting effects
Prevention precautionary statements	P260 Do not breathe dust/fume/gas/mist/vapours/spray. P261 Avoid breathing dust/fume/gas/mist/vapours/spray P264 Wash...thoroughly after handling P270 Do not eat, drink or smoke when using this product. P271 May cause fire or explosion: strong oxidizer P272 Contaminated work clothing should not be allowed out of the workplace. P273 Avoid release to the environment. P280 Wash...thoroughly after handling P281 Use personal protective equipment as required.
Response precautionary statements	P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. P302+P352 IF ON SKIN (or hair): Wash with plenty of soap and water. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P307+P311 IF exposed: Call a POISON CENTER or doctor/physician. P308+P313 IF exposed or concerned: Get medical advice/attention. P314 Get medical advice/attention if you feel unwell. P321 Specific treatment (see ... on this label). P330 Rinse mouth. P332+P313 If skin irritation occurs: Get medical advice/attention. P333+P313 If skin irritation or rash occurs: Get medical advice/attention. P337+P313 If eye irritation persists: Get medical advice/attention. P362 Take off contaminated clothing and wash before reuse. P363 Wash contaminated clothing before reuse. P391 Collect spillage. P405 Store locked up
Storage precautionary statements	P501 Dispose of contents/container in accordance with local/regional/national/international regulation (to be specified).
Disposal precautionary statements:	
c. Other harmful or danger characteristic (NFPA)	

BENZENEMETHANOL	
Health hazard	2
Fire	1
Reactivity Hazard	0
1,3-BENZENEDIMETHANAMINE	
Health hazard	4
Fire	1
Reactivity Hazard	0
5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANEMETHAMINE	
Health hazard	3
Fire	1
Reactivity Hazard	0
4,4'-Methylenebiscyclohexylamine	
Health hazard	3
Fire	1
Reactivity Hazard	0
(2,4,6-TRIS((DIMETHYLAMINO)METHYL)PHENO	
Health hazard	3
Fire	1
Reactivity Hazard	0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS NO.	Amount(%)
BENZENEMETHANOL	100-51-6	5~10
1,3-BENZENEDIMETHANAMINE	1477-55-0	10~20
5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANEMETHAMINE	2855-13-2	40~50
4,4'-Methylenebiscyclohexylamine	1761-71-3	20~30
(2,4,6-TRIS((DIMETHYLAMINO)METHYL)PHENO	90-72-2	0~5

4. First aid measures

a. Eye contact	Flush eyes with plenty of water for at least 15 minutes while holding eyelids open. Consult a physician if signs of irritation appear.
b. Skin contact	Immediately remove contaminated clothing or shoes, wash skin with plenty of water for at least 15 minutes. Use soap if readily available, or follow by thoroughly washing soap and water. Do not reuse clothing until thoroughly decontaminated.
c. Inhalation	Move person to fresh air area and provide oxygen if breathing is difficult. Consult a physician if effects occur.
d. Ingestion	Do not induce vomiting because of risk of aspiration. Rinse mouth with water. Consult a physician if effects occur.

5. Fire fighting measures

Hazardous products of Combustion	In case of fire, toxic fumes might be formed
Extinguishing media	Water spray, foam, dry chemical, or carbon dioxide
Unusual fire or explosion Hazards	May produce hazardous fumes of hazardous decomposition products
Special fire fighting Procedures	When fire fighting, wear full protective equipment including self-contained breathing

6. Accidental release measures

Personal precautions	Put on adequate protective equipment. See section 8, Exposure control/ Personal Protection
Environmental precautions	Keep away from drains, surface-water, ground water and soil.
Clean-up Method	Sweep spilled material into non-leaking containers. All disposal methods must be in compliance with applicable local regulations.

7. Handling and storage

a. Storage	Keep away from: acids, alkalis, oxidizers. Keep in cool, dry, ventilate storage and in closed containers. Store in steel containers preferably located outdoors,
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above ground, and surrounded by dikes to contain spills or leaks. Avoid freezing temperatures during storage. Do not store in reactive metal containers. Product may partially freeze with extended exposure to cold temperatures.

b. Handling

When handling, do not eat, drink, or smoke. Avoid contact with eyes. Avoid contact with skin. Spraying increases the risk of hazardous exposure. In atmospheres where the material is sprayed, workers should avoid contact with aerosols containing S through proper engineering controls, such as exhaust ventilation. Wear goggles and face shield. Do not get into the eyes. Other individuals working in the vicinity of the product where exposure can occur should also be fitted with chemical splash goggles. Contaminated clothing should be properly disposed of in a manner that will not cause additional exposure. Workers should be strongly encouraged to follow good personal hygiene practices, such as thorough washing of hands, arms, neck and face following working with HOC-701.

8. Exposure controls/personal protection

a. Exposure Limits

National regulations

BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	TWA – C 0.1mg/m3
5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANEMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-	No Data

ACGIH regulations

BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	C 0.1 mg/m ³
5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANEMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-	No Data

Biological exposure limits

BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANEMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-	No Data

b. Suitable Engineering Management

Use process isolation, local ventilation or other engineering management to maintain air quality under exposure limits.
Set wash up facilities and safe shower system, where storage or use of this material.

c. Personal protector

Eye protection	Safety glasses with side shields.
Hands protection	Chemical resistant gloves.
Skin and body protection	Chemical resistant protective suit. Chemicals resistant boots.
Respiratory protection	Never exceed the national Occupational Exposure Limit. Use local. Exhaust ventilation or handle in a ventilated enclosure. For greater protection a face piece chemical cartridge respirator is recommended.

9. Physical and chemical properties

1. Appearance

Type	Liquid
Color	Lemon yellow
2. Odor	No Data
3. Odour threshold	No Data
4. pH	No Data
5. Melting Point/Freezing Point	No Data
6. Boiling Point	No Data
7. Flash Point	No Data
8. Evaporation Rate	No Data
9. Flammability	No Data
10. Flammable Limits	No Data
11. Vapor Pressure	No Data
12. Solubility in WATER	No Data
13. Vapor density(water=1)	No Data

14. Density	0.95~1.05
15. n-Octanol/Water Partition coefficient	No Data
16. Autoignition Temperature	No Data
17. Decomposition Temperature	No Data
18. Viscosity(at 25℃)	160~240cps(25℃)
19. Molecular Weight	No Data

10. Stability and reactivity

Conditions to avoid	Can react strongly with epoxy resins at elevated temperature
Materials to avoid	Acids, amines, bases, oxidizing agents
Hazardous reaction	Hazardous polymerization does not occur by itself
Decomposition temperature	Not available
Hazardous decomposition component	Hazardous decomposition products are not expected to form during normal storage

11. Toxicological information

a. Information on the likely routes of exposure

1,3-BENZENEDIMETHANAMINE Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation.

Salicylic acid No Data

b. Acute Toxicity Data

Acute toxic

Oral

BENZENEMETHANOL	LD50 1230 mg/kg Rat
1,3-BENZENEDIMETHANAMINE	LD50 980 mg/kg Rat
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	LD50 1030 mg/kg Rat
4,4'-Methylenebiscyclohexylamine	LD50 1000 mg/kg Rat
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	LD50 1200 mg/kg Rat
Dermal	
BENZENEMETHANOL	LD50 2000 mg/kg Rabbit
1,3-BENZENEDIMETHANAMINE	LD50 2000 mg/kg Rabbit
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	LD50 2110 mg/kg Rabbit
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	LD50 1280 mg/kg Rat
Inhalation	
BENZENEMETHANOL	LC50 0.9 mg/l 4 hr Rat
1,3-BENZENEDIMETHANAMINE	LC50 2800 ppm 4 hr Rat
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	Vapor LC50 0.4 mg/l 기타 (mouse)
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	No Data
Skin Corrosion/Irritation	
BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	No Data
Serious Eye Damage/Irritation	
BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	No Data
Respiratory sensitization	
BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	No Data

Skin sensitization

BENZENEMETHANOL No Data

1,3-BENZENEDIMETHANAMINE No Data

5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANFMETHAMINE No Data

4,4'-Methylenebiscyclohexylamine No Data

(2,4,6-TRIS((DIMETHYLAMINO)METHYL)PHENOL No Data

Carcinogenicity

BENZENEMETHANOL No Data

1,3-BENZENEDIMETHANAMINE No Data

5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANFMETHAMINE No Data

4,4'-Methylenebiscyclohexylamine No Data

(2,4,6-TRIS((DIMETHYLAMINO)METHYL)PHENOL No Data

IARC

BENZENEMETHANOL No Data

1,3-BENZENEDIMETHANAMINE No Data

5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANFMETHAMINE No Data

4,4'-Methylenebiscyclohexylamine No Data

(2,4,6-TRIS((DIMETHYLAMINO)METHYL)PHENOL No Data

OSHA

BENZENEMETHANOL No Data

1,3-BENZENEDIMETHANAMINE No Data

5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANFMETHAMINE No Data

4,4'-Methylenebiscyclohexylamine No Data

(2,4,6-TRIS((DIMETHYLAMINO)METHYL)PHENOL No Data

ACGIH

BENZENEMETHANOL No Data

1,3-BENZENEDIMETHANAMINE No Data

5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANFMETHAMINE No Data

4,4'-Methylenebiscyclohexylamine No Data

(2,4,6-TRIS((DIMETHYLAMINO)METHYL)PHENOL No Data

NTP

BENZENEMETHANOL No Data

1,3-BENZENEDIMETHANAMINE No Data

5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANFMETHAMINE No Data

4,4'-Methylenebiscyclohexylamine No Data

(2,4,6-TRIS((DIMETHYLAMINO)METHYL)PHENOL No Data

EU CLP

BENZENEMETHANOL No Data

1,3-BENZENEDIMETHANAMINE No Data

5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANFMETHAMINE No Data

4,4'-Methylenebiscyclohexylamine No Data

(2,4,6-TRIS((DIMETHYLAMINO)METHYL)PHENOL No Data

Germ Cell Mutagenicity

BENZENEMETHANOL No Data

1,3-BENZENEDIMETHANAMINE No Data

5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANFMETHAMINE No Data

4,4'-Methylenebiscyclohexylamine No Data

(2,4,6-TRIS((DIMETHYLAMINO)METHYL)PHENOL No Data

Reproductive toxicity

BENZENEMETHANOL No Data

1,3-BENZENEDIMETHANAMINE No Data

5-AMINO-1,3,3-TRIMETHYLCYCLOHEXANFMETHAMINE No Data

4,4'-Methylenebiscyclohexylamine No Data

(2,4,6-TRIS((DIMETHYLAMINO)METHYL)PHENOL No Data

Specific target organ toxicity (single exposure):

BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	No Data
Specific target organ toxicity (repeated exposure):	
BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	No Data
Aspiration hazard	
BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	No Data

12. Environmental information

a. Aquatic and terrestrial ecotoxicity:

Fish toxicity (Acute):

BENZENEMETHANOL	LC50 10 mg/l 96 hr
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	LC50 46 ~ 100 mg/l 96 hr Leuciscus idus
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	LC50 447.821 mg/l 96 hr

Water flea toxicity (Acute):

BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	EC50 17.4 mg/l 48 hr
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	LC50 28.198 mg/l 48 hr

Birds growth hinderance test (Acute):

BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	ErC50 14 mg/l 72 hr
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	EC50 34.812 mg/l 96 hr

b. Persistence and degradability:

Persistence:

BENZENEMETHANOL	log Kow 1.1
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	log Kow 3.26
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	log Kow 0.77

Degradability:

BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	No Data

c. Bioaccumulative potential:

condenasability

BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-TRIMETHYL CYCLOHEXANFMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	BCF 65.16
(2,4,6-TRIS((DIMETHYL AMINO)METHYL)PHENOL	BCF 3.162

biodegradability	
BENZENEMETHANOL	94 (%) 28 day
1,3-BENZENEDIMETHANAMINE	22 (%)
5-AMINO-1,3,3-	8 (%) 28 day
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-	No Data
d. Mobility in soil:	No Data
	No Data
e. Other adverse effects:	
BENZENEMETHANOL	No Data
1,3-BENZENEDIMETHANAMINE	No Data
5-AMINO-1,3,3-	No Data
TRIMETHYL CYCLOHEXANEMETHAMINE	No Data
4,4'-Methylenebiscyclohexylamine	No Data
(2,4,6-	No Data
TRIS((DIMETHYL AMINO)METHYL)PHENOL	No Data

13. Disposal considerations

Incineration is the recommended disposal method for all chemical wastes. Material collected on absorbent material may be disposed in a landfill in accordance with all applicable local, state and federal regulations

14. Transport information

a. UN No.	2289
b. Proper Shipping Name	(AMINES,LIQUID,CORROSIVE,N.O.S. or POLYAMINES,LIQUID,CORROSIVE,N.O.S.)
c. Transportation Class	3
d. Packing Group	II
e. Marine Pollutant	No data
f. Special precautions for user	
fire emergency	F-A
spill Emergency	S-B

15. Regulation information

a. Industrial Safety and Health Act	No Data
b. Toxic Chemical Control Act	No Data
c. Dangerous Material Safety Control Act	
d. Wastes Management Act	No Data
e. Other requirements in domestic and other countries	
National regulation	Not applicable
other countries	
U.S.A(OSHA)	Not applicable
U.S.A(CERCLA)	Not applicable
U.S.A(EPCRA 302)	Not applicable
1,3-BENZENEDIMETHANAMINE	Not applicable
Salicylic acid	Not applicable
USA(EPCRA 304)	
1,3-BENZENEDIMETHANAMINE	Not applicable
Salicylic acid	Not applicable

EU	
1,3-BENZENEDIMETHANAMINE	Not applicable
Salicylic acid	Not applicable

16. Other requirements in domestic and other countries

a. Information source and references

Corporate Solution From Thomson Micromedex(<http://csi.micromedex.com>)
 ECB-ESIS(European chemical Substances Information System)(<http://ecb.jrc.it/esis>)
 ECOTOX Database, EPA(<http://cfpub.epa.gov/ecotox>)
 IUCLID Chemical Data Sheet, EC-ECB
 International Chemical Safety Cards(ICSC)(<http://www.nihs.go.jp/ICSC>)
 TOXNET, U.S. National Library of Medicine(<http://toxnet.nlm.nih.gov>)
 The Chemical Database, The Department of Chemistry at the University of Akron(<http://ull.chemistry.uakron.edu/erd>)
 (<http://hazmat.nema.go.kr>)
 (<http://ncis.nier.go.kr>)
 National Institute of Technology and Evaluation(NITE)(http://www.safe.nite.go.jp/ghs/h18_bunrui.html)
 Corporate Solution From Thomson Micromedex(<http://csi.micromedex.com>)
 Corporate Solution From Thomson Micromedex(<http://csi.micromedex.com>)
 National Library of Medicine(NLM)(<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CHEM>)
 Corporate Solution From Thomson Micromedex(<http://csi.micromedex.com>)
 European chemical Substances Information System(ECB-ESIS)(<http://ecb.jrc.it/esis>)
 National Institute of Technology and Evaluation(NITE)(http://www.safe.nite.go.jp/ghs/h18_bunrui.html)
 Corporate Solution From Thomson Micromedex(<http://csi.micromedex.com>)
 National Institute of Technology and Evaluation(NITE)(http://www.safe.nite.go.jp/ghs/h18_bunrui.html)
 European chemical Substances Information System(ECB-ESIS)(<http://ecb.jrc.it/esis>)
 National Library of Medicine/Chemical Carcinogenesis Research Information System(NLM/CCRIS)(<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CCRIS>)
 National Library of Medicine/genetic toxicology(NLM/GENETOX)(<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?GENETOX>)
 National Institute of Technology and Evaluation(NITE)(http://www.safe.nite.go.jp/ghs/h18_bunrui.html)
 Corporate Solution From Thomson Micromedex(<http://csi.micromedex.com>)

b. Issuing date	2013-06-28
c. Revision number and date	
Revision number	3
Date	2015-10-08
d. Others	-