

SAFETY DATA SHEET

KER 220

Date of issue: 2013-09-13

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Version: R0005.0002

1. IDENTIFICATION

A. Product name

- KER 220 [SDS-132]

B. Recommended use and restriction on use

- General use : Epoxy
- Restriction on use : -

C. Manufacturer / Supplier / Distributor information

o Manufacturer information

- Company name : KUMHO P&B CHEMICALS.INC
- Address : 218, Yeosusandan 2-ro, Yeosu, Jeollanamdo, Korea
- Dept. : Environment & Safety Team
- Telephone number : 061-688-3682,061-688-3684
- Emergency telephone number : 061-688-3507
- Fax number : 061-688-3686

o Supplier/Distributor information

- Company name : KUMHO P&B CHEMICALS
- Address : East Wing 8F, SignitureTowers Seoul, 100 Cheonggyecheon-ro, jung-gu, Seoul,
- Dept. : Epoxy Resin Business Team
- Telephone number : +82-2-6961-3464,3481
- Emergency telephone number : +82-2-6961-1114
- Fax number : 82-2-6961-3490,3492
- E-mail address : epoxy_domestic@kpb.co.kr

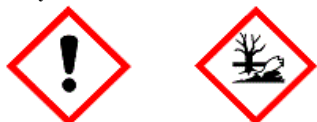
2. HAZARD IDENTIFICATION

A. GHS Classification

- Skin corrosion/irritation : Category2
- Serious eye damage/irritation : Category2A
- Skin sensitization : Category1
- Chronic aquatic toxicity : Category2

B. GHS label elements

o Hazard symbols



o Signal words

- Warning

o Hazard statements

- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H319 Causes serious eye irritation
- H411 Toxic to aquatic life with long lasting effects

o Precautionary statements

1) Prevention

- P261 Avoid breathing gas/mist/vapours/spray.
- P264 Wash hands 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.

2) Response

- P302+P352 IF ON SKIN: 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.
- P321 Specific treatment
- 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.

3) Storage

- Not applicable

4) Disposal

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

C. Other hazards which do not result in classification : (NFPA Classification)

o NFPA grade (0 ~ 4 level)

- Health : 2, Flammability : 1, Reactivity : 0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
2,2-Bis(4'-glycidyloxyphenyl)propane	Diphenylol propane diglycidyl ether ; Bisphenol A diglycidyl ether ; Dimethylmethane diglycidyl ether ; 2,2-bis(4-(2,3-Epoxypropoxy)phenyl) propane ; 2,2'-[(1-Methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane ; 4,4'-Bis(2,3-epoxypropoxy)diphenyldimethyl methane ; Bis(4-hydroxyphenyl)dimethylmethane diglycidyl ether ; Oxirane, 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis- ; 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane ; Bisphenol A diglycidyl ether	1675-54-3	85~90
Oxirane, mono[(alkyl(C=12-14)oxy)methyl] derivs.	-	68609-97-2	10 ~ 15

4. FIRST AID MEASURES**A. Eye contact**

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15 minutes and call a doctor/physician.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- Remove contact lenses if worn.

B. Skin contact

- Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- Laundering enough contaminated clothing before reuse.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- Wash thoroughly after handling.

C. Inhalation contact

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.

D. Ingestion contact

- Please be advised by doctor whether induction of vomit is demanded or not.
- Rinse your mouth with water immediately.

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

- Not available

F. Notes to physician

- Notify medical personnel of contaminated situations and have them take appropriate protective measures.

5. FIREFIGHTING MEASURES**A. Suitable (Unsuitable) extinguishing media**

- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

B. Specific hazards arising from the chemical

- Not available

C. Special protective actions for firefighters

- Using unattended water devices in case of large fire and leave alone to burn if you do not imperative.
- Do not access if the tank on fire.
- Use appropriate extinguishing measure suitable for surrounding fire.
- Wear appropriate protective equipment.
- Keep containers cool with water spray.
- Vapor or gas is burned at distant ignition sources can be spread quickly.

6. ACCIDENTAL RELEASE MEASURES**A. Personal precautions, protective equipment and emergency procedures**

- Ventilate closed spaces before entering.
- Must work against the wind, let the upwind people to evacuate.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Remove all sources of ignition.
- Do not direct water at spill or source of leak.
- Avoid skin contact and inhalation.

B. Environmental precautions

- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.

C. Methods and materials for containment and cleaning up

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notification to central government, local government. When emissions at least of the standard amount
- Dispose of waste in accordance with local regulation.
- Appropriate container for disposal of spilled material collected.
- Small leak: sand or other non-combustible material, please let use absorption.
- Wipe off the solvent.
- Dike for later disposal.
- Prevent the influx to waterways, sewers, basements or confined spaces.

7. HANDLING AND STORAGE**A. Precautions for safe handling**

- Avoid contact with incompatible materials.
- Comply with all applicable laws and regulations for handling
- Refer to Engineering controls and personal protective equipment.
- Operators should wear antistatic footwear and clothing.
- Do not inhale the steam prolonged or repeated.

B. Conditions for safe storage, including any incompatibilities

- Do not apply direct heat.
- Avoid direct sunlight.
- Keep in the original container.
- Please pay attention to incompatibilities materials and conditions to avoid.
- No open fire.
- Collected them in sealed containers.
- Store away from water and sewer.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits

- **ACGIH TLV**
 - Not available
- **OSHA PEL**
 - Not available

B. Engineering controls

- A system of local and/or general exhaust is recommended to keep employee exposures above the Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. The use of local exhaust ventilation is recommended to control emissions near the source.

C. Individual protection measures, such as personal protective equipment

- **Respiratory protection**
 - Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
 - Respiratory protection is ranked in order from minimum to maximum.
 - Consider warning properties before use.
 - Any chemical cartridge respirator with organic vapor cartridge(s).
 - Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).
 - Any air-purifying respirator with a full facepiece and an organic vapor canister.
 - For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.
- **Eye protection**
 - Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
 - Provide an emergency eye wash station and quick drench shower in the immediate work area.
- **Hand protection**
 - Wear appropriate glove.
- **Skin protection**
 - Wear appropriate clothing.
- **Others**
 - Not available

9. PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance	
- Appearance	Liquid(Viscous liquid)
- Color	Transparent (light yellow)
B. Odor	Chemistry smell
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	-85 °C
F. Initial Boiling Point/Boiling Ranges	≥ 164 °C
G. Flash point	≥ 106 °C

H. Evaporation rate	Not available
I. Flammability(solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	Not available
K. Vapour pressure	Not available
L. Solubility	Insoluble in Water
M. Vapour density	3.78 (Air=1)
N. Specific gravity(Relative density)	1.10 at 25 °C
O. Partition coefficient of n-octanol/water	Not available
P. Autoignition temperature	Not available
Q. Decomposition temperature	Not available
R. Viscosity	1.4 ~1.9 Pa.s at 25 °C
S. Molecular weight	Not available

10. STABILITY AND REACTIVITY

A. Chemical Stability

- This material is stable under recommended storage and handling conditions.

B. Possibility of hazardous reactions

- Hazardous Polymerization will not occur.

C. Conditions to avoid

- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces

D. Incompatible materials

- Not available

E. Hazardous decomposition products

- May emit flammable vapour if involved in fire.

11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure

- (Respiratory tracts)
 - Not available
- (Oral)
 - Not available
- (Eye-Skin)
 - Causes serious eye irritation
 - Causes skin irritation
 - May cause an allergic skin reaction

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

- Acute toxicity
 - * Oral
 - Product (ATEmix) : >5000mg/kg
 - [2,2-Bis(4'-glycidyoxyphenyl)propane] : LD50 11,300 mg/kg rat (HSDB)
 - [Oxirane, mono[(alkyl(C=12-14)oxy)methyl] derivs.] : LD50 = 17100 mg/kg Rat (Thomson)
 - * Dermal
 - Product (ATEmix) : >5000mg/kg
 - [2,2-Bis(4'-glycidyoxyphenyl)propane] : LD50 >23,200 mg/kg Rabbit (IARC, NITE)
 - * Inhalation
 - Not available
- Skin corrosion/irritation
 - Causes skin irritation
- Serious eye damage/irritation
 - Causes serious eye irritation
- Respiratory sensitization
 - Not available

- **Skin sensitization**
 - May cause an allergic skin reaction
- **Carcinogenicity**
 - * **IARC**
 - [2,2-Bis(4'-glycidyoxyphenyl)propane] : Group 3
 - * **OSHA**
 - Not available
 - * **ACGIH**
 - Not available
 - * **NTP**
 - Not available
 - * **EU CLP**
 - Not available
- **Germ cell mutagenicity**
 - Not available
- **Reproductive toxicity**
 - Not available
- **STOT-single exposure**
 - Not available
- **STOT-repeated exposure**
 - Not available
- **Aspiration hazard**
 - Not available

12. ECOLOGICAL INFORMATION

A. Ecotoxicity

- **Fish**
 - [Oxirane, mono[(alkyl(C=12-14)oxy)methyl] derivs.] : LC50 0.002 mg/ℓ 96 hr (Estimate)
- **Crustaceans**
 - [Oxirane, mono[(alkyl(C=12-14)oxy)methyl] derivs.] : LC50 0.003 mg/ℓ 48 hr (Estimate)
- **Algae**
 - [Oxirane, mono[(alkyl(C=12-14)oxy)methyl] derivs.] : EC50 0.003 mg/ℓ 96 hr (Estimate)

B. Persistence and degradability

- **Persistence**
 - [Oxirane, mono[(alkyl(C=12-14)oxy)methyl] derivs.] : log Kow 7.25 (Estimate)
- **Degradability**
 - Not available

C. Bioaccumulative potential

- **Bioaccumulative potential**
 - [Oxirane, mono[(alkyl(C=12-14)oxy)methyl] derivs.] : BCF 934.9 (Estimate)
- **Biodegradation**
 - Not available

D. Mobility in soil

- [Oxirane, mono[(alkyl(C=12-14)oxy)methyl] derivs.] : Koc = 12830

E. Other adverse effects

- Not available

13. DISPOSAL CONSIDERATIONS

A. Disposal methods

- Since more than two kinds of designaed waste is mixed, it is difficult to treat seperatly, then can be reduction or stabilization by incineration or similar process.
- If water separation is possible, pre-process with Water separation process.
- Dispose by incineration.

B. Special precautions for disposal

- The user of this product must disposal by oneself or entrust to waste disposer or person who other's waste recycle and dispose, person who establish and operate waste disposal facilities.

- Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

A. UN No. (IMDG CODE/IATA DGR)

- 3082

B. Proper shipping name

- ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (2,2-Bis(4'-glycidyoxyphenyl)propane)

C. Hazard Class

- 9

D. IMDG CODE/IATA DGR Packing group

- III

E. Marine pollutant

- Applicable

F. Special precautions for user related to transport or transportation measures

- Local transport follows in accordance with Dangerous goods Safety Management Law.

- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.

- EmS FIRE SCHEDULE : F-A (General fire schedule)

- EmS SPILLAGE SCHEDULE : S-F (Water-soluble marine pollutants)

15. REGULATORY INFORMATION

A. National and/or international regulatory information

o POPs Management Law

- Not applicable

o Information of EU Classification

* Classification

- [2,2-Bis(4'-glycidyoxyphenyl)propane] : H319, H315, H317

- [Oxirane, mono[(alkyl(C=12-14)oxy)methyl] derivs.] : H315, H317

o U.S. Federal regulations

* OSHA PROCESS SAFETY (29CFR1910.119)

- Not applicable

* CERCLA Section 103 (40CFR302.4)

- Not applicable

* EPCRA Section 302 (40CFR355.30)

- Not applicable

* EPCRA Section 304 (40CFR355.40)

- Not applicable

* EPCRA Section 313 (40CFR372.65)

- Not applicable

o Rotterdam Convention listed ingredients

- Not applicable

o Stockholm Convention listed ingredients

- Not applicable

o Montreal Protocol listed ingredients

- Not applicable

16. OTHER INFORMATION

A. Reference

- The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.

- This Safety Data Sheet was compiled with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS, IPCS

B. Issue date

- 2013-09-13

C. Revision number and Last date revised

- 5 times, 2018-07-02

D. Other

- This SDS is prepared according to the Globally Harmonized System (GHS).