

SAFETY DATA SHEET

KER 920C

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Version: R0005.0001

1. IDENTIFICATION

A. Product name

- KER 920C [MSDS-129]

B. Recommended use and restriction on use

- General use : Epoxy
- Restriction on use : Not available

C. Manufacturer / Supplier / Distributor information

o Manufacturer information

- Company name : KUMHO P&B CHEMICALS
- Address : #218, Yeosu-Sandan 2ro, Yeosu-city Jeollanam-do, Korea
- Dept. : Environment & Safety Team
- Telephone number : 82-61-688-3682
- Emergency telephone number : 82-61-688-3500
- Fax number : 82-61-688-3686

o Supplier/Distributor information

- Company name : KUMHO P&B CHEMICALS
- Address : East Wing 8F, SignitureTowers Seoul, 100 Cheonggyecheon-ro, jung-gu, Seoul, Korea
- 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_export@kpb.co.kr

2. HAZARD IDENTIFICATION

A. GHS Classification

- Flammable liquids : Category3
- Acute toxicity (oral) : Category4
- Skin corrosion/irritation : Category2
- Skin sensitization : Category1
- Germ cell mutagenicity : Category2
- Reproductive toxicity : Category2
- Specific target organ toxicity(Single exposure) : Category1
- Specific target organ toxicity(Repeated exposure) : Category1

B. GHS label elements

o Hazard symbols



o Signal words

- Danger

o Hazard statements

- H226 Flammable liquid and vapour

- H302 Harmful if swallowed
- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H341 Suspected of causing genetic defects
- H361 Suspected of damaging fertility or the unborn child
- H370 Causes damage to organs(Refer Section SDS 11)
- H372 Causes damage to organs through prolonged or repeated exposure (Refer Section SDS 11)

o **Precautionary statements**

1) Prevention

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P233 Keep container tightly closed.
- P240 Ground/bond container and receiving equipment.
- P241 Use explosion-proof electrical/ventilating/lighting/equipment.
- P242 Use only non-sparking tools. Flammable liquids (chapter 2.6) 1, 2, 3
- P243 Take precautionary measures against static discharge.
- P260 Do not breathe gas/mist/vapours/spray.
- P261 Avoid breathing gas/mist/vapours/spray.
- P264 Wash hands thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P272 Contaminated work clothing should not be allowed out of the workplace.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.

2) Response

- P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P302+P352 IF ON SKIN: Wash with plenty of soap and water.
- P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- 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**
- 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.
- P362 Take off contaminated clothing and wash before reuse.
- P363 Wash contaminated clothing before reuse.
- P370+P378 In case of fire: Use Suitable extinguishing media for extinction(Refer Section MSDS 5).

3) Storage

- P403+P235 Store in a well-ventilated place. Keep cool.
- P405 Store locked up.

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 : 2, Reactivity : 1

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
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2,2-Bis(4'-glycidyloxyphenyl)propane	Diphenylol propane dicyclidyl 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
[(2-Propenyloxy)methyl]oxirane	-	106-92-3	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.
- Get medical attention immediately.

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.
- Get medical attention immediately.
- 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.
- Get medical attention immediately.
- If breathing is stopped or irregular, give artificial respiration and supply oxygen.

D. Ingestion contact

- Please be advised by doctor whether induction of vomit is demanded or not.
- Rinse your mouth with water immediately.
- Get medical attention 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.
- If exposed or concerned, get medical attention/advice.

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 a unattended and water devices in case of large fire and leave alone to burn if you do not imperative.
- Avoid inhalation of materials or combustion by-products.
- 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.
- Due to the extremely low flash point, irrigating fire extinguishing may be less effective when put out a fire.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures

- Wear proper personal protective apparatus as indicated in Section 8 and avoid skin contact and inhalation.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Remove all sources of ignition.
- Handling the damaged containers or spilled material after wearing protective equipment.
- Do not direct water at spill or source of leak.
- Avoid skin contact and inhalation.
- Cleanup and disposal under expert supervision is advised.
- Keep unauthorized people away, isolate hazard area and deny entry.

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.
- Do not use plastic containers.

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Avoid direct physical contact.
- Since emptied containers retain product residue(vapor, liquid, solid) follow all MSDS and label warnings even after container is emptied.
- Comply with all applicable laws and regulations for handling
- Dealing only with a well-ventilated place.
- Do not inhale the steam prolonged or repeated.
- Avoid contact with heat, sparks, flame or other ignition sources.
- Contaminated work clothing should not be allowed out of the workplace.

B. Conditions for safe storage, including any incompatibilities

- Save applicable laws and regulations.
- Do not apply any physical shock to container.
- Please pay attention to incompatibilities materials and conditions to avoid.
- Keep sealed when not in use.
- Prevent static electricity and keep away from combustible materials or heat sources.
- Collected them in sealed containers.
- Do not eat, drink or smoke when using this product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits

- o ACGIH TLV

- [[(2-Propenyloxy)methyl]oxirane] : TWA, 1 ppm (4.7 mg/m³)
- **OSHA PEL**
- [[(2-Propenyloxy)methyl]oxirane]:(C) 10 (C) 45

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 chemical resistant glove.
- **Skin protection**
 - Wear appropriate chemical resistant protective clothing.
- **Others**
 - Not available

9. PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance	
- Appearance	Liquid(Viscous liquid)
- Color	Clear(pale yellow)
B. Odor	Alchol smell
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	< -100 °C
F. Initial Boiling Point/Boiling Ranges	> 154 °C
G. Flash point	> 48 °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	14.1g/100ml
M. Vapour density	3.9(Air=1)
N. Specific gravity(Relative density)	0.97
O. Partition coefficient of n-octanol/water	0.45 (추정치)
P. Autoignition temperature	Not available
Q. Decomposition temperature	Not available
R. Viscosity	1.00 ~ 3.00 Pa.s at 25 °C
S. Molecular weight	235~263

10. STABILITY AND REACTIVITY

A. Chemical Stability

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

B. Possibility of hazardous reactions

- Cylinders exposed to fire may vent and release flammable gas.

C. Conditions to avoid

- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces
- Avoid contact with heat, sparks, flame or other ignition sources.

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)**
 - Harmful if swallowed
- **(Eye·Skin)**
 - 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) : 2000mg/kg < ATEmix <= 5000mg/kg
 - [2,2-Bis(4'-glycidyoxyphenyl)propane] : LD50 11,300 mg/kg rat (HSDB)
 - [[(2-Propenyloxy)methyl]oxirane] : LD50 = 830 mg/kg Rat
 - * **Dermal**
 - Product (ATEmix) : >5000mg/kg
 - [2,2-Bis(4'-glycidyoxyphenyl)propane] : LD50 >23,200 mg/kg Rabbit (IARC, NITE)
 - [[(2-Propenyloxy)methyl]oxirane] : LD50 = 2550 mg/kg Rabbit
 - * **Inhalation**
 - Product (ATEmix) : 2.0mg/L < ATEmix <= 10.0mg/L
 - [[(2-Propenyloxy)methyl]oxirane] : LC50 = 4.44 mg/L 4hr (950 ppm 4 hr Rat의 환산치)
- **Skin corrosion/irritation**
 - Causes skin irritation
- **Serious eye damage/irritation**
 - Not available
- **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**
 - [[(2-Propenyloxy)methyl]oxirane] : A4
 - * **NTP**
 - Not available
 - * **EU CLP**
 - [[(2-Propenyloxy)methyl]oxirane] : Carc.2
- **Germ cell mutagenicity**
 - Suspected of causing genetic defects
- **Reproductive toxicity**
 - Suspected of damaging fertility or the unborn child

- **STOT-single exposure**
 - Causes damage to organs
- **STOT-repeated exposure**
 - Causes damage to organs through prolonged or repeated exposure
- **Aspiration hazard**
 - Not available

12. ECOLOGICAL INFORMATION

A. Ecotoxicity

- **Fish**
 - [[(2-Propenyloxy)methyl]oxirane] : LC50 = 30 mg/ℓ 96 hr (NITE)
- **Crustaceans**
 - Not available
- **Algae**
 - Not available

B. Persistence and degradability

- **Persistence**
 - [[(2-Propenyloxy)methyl]oxirane] : log Kow = 0.34 (NITE)
- **Degradability**
 - Not available

C. Bioaccumulative potential

- **Bioaccumulative potential**
 - Not available
- **Biodegradation**
 - [[(2-Propenyloxy)methyl]oxirane] : BOD: 37 (%) (NITE)

D. Mobility in soil

- Not available

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 seপরately, 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.
- Incinerate the oil by separating the oil and water
- The remainder of the water after separation will be processed in a water pollution prevention facilities.
- Do incineration or stabilization of the residue after disposal as the method of evaporation and concentration.
- Do incineration of the residue after disposal as the method of agglomeration and precipitation.
- Take care of incinerate or stabilization after treatment, purified by means of Separation•distillation•extractio•filtration•pyrolysis

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)

- 1866

B. Proper shipping name

- Resin solution, flammable

C. Hazard Class

- 3

D. IMDG CODE/IATA DGR Packing group

- III

E. Marine pollutant

- Not 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-E (Non-water-reactive flammable liquids)
- EmS SPILLAGE SCHEDULE : S-E (Flammable liquids, floating on water)

15. REGULATORY INFORMATION**A. National and/or international regulatory information**

- **POPs Management Law**
 - Not applicable
- **Information of EU Classification**
 - * **Classification**
 - [2,2-Bis(4'-glycidyloxyphenyl)propane] : H319, H315, H317
 - [[(2-Propenyloxy)methyl]oxirane] : H226, H351, H341, H361f, H332, H302, H335, H315, H318, H317, H412
- **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
- **Rotterdam Convention listed ingredients**
 - Not applicable
- **Stockholm Convention listed ingredients**
 - Not applicable
- **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

- 1 times, 2018-07-11

D. Other

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