Base Load Power Hub (BLPH)

MSDS (Material Safety Data)

Document Number: 1723001595-EL-DS-00022

Document Class: 3

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
Luca Moeurle	27/05/2024

Rev.	Date	Description	Prepared	Reviewed	Approved
02	24/05/2024	Issue for Information (IFI)	Y.D.LEE	Y.W.LEE	S.J.CHO
01	16/04/2024	Issue for Information (IFI)	Y.D.LEE	Y.W.LEE	S.J.CHO
00	24/11/2023	Issue for Information (IFI)	Y.D.LEE	Y.W.LEE	S.J.CHO

HYOSUNG HEAVY INDUSTRIES

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SH.	DESCRIPTION	REVISIONS							
		00	01	02					
1	Cover	X	X	X					
2	Table of Contents	X	X	X					
3	Revision / Change Log	X	X	X					
4	Description of use	X	X	X					
5~138	MSDS	X	X	X					

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Revision / Change Log

Rev.	Description
00	ISSUE FOR INFORMATION (IFI)
01	ISSUE FOR INFORMATION (IFI)
02	ISSUE FOR INFORMATION (IFI)

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

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< Description of use for each materials >

No.	Name of materials	Description of use
1	MIX GAS	GIS Insulation GAS
2	UT6780(H)(S)-RAL7032(HS)	Paint for site touch-up
3	2958(RT)CA	Hardener for Paint
4	037U(FOR SUMMER)	Summer for Paint
5	YUSOL-EI120H	Clean material for Enclosure and Conductor
6	INTERTHANE 976 POLYURETHANE VARNISH PTA	Anti-Rust Additive for Copper
7	INTERTHANE 976 PART B	Anti-Rust Additive for Copper
8	MOLYKOTE 111 COMPOUND	Anti-Rust Additive and Water proofer
9	LUBCHEM VA 3012 F	lubricant for sealing materials
10	SIKAFLEX-221	Water proofer for outside of flanges
11	LUBCHEM CA 8242 HS	Water proofer for between flanges
12	LOCTITE 242 THREADLOCKER MEDIUM STRENGTH	Adhesive for bolts
13	LOCTITE 263 THREADLOCKER	Adhesive for bolts

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Material Safety Data Sheet

Material	Mix gas (Nitrogen 21% + Oxygen 79%)

1. Product and company identification

1.1. Product name: Mix gas (Nitrogen 21% + Oxygen 79%)

1.2. Recommended Use and Usage Restrictions

- Recommended use of products: No Data
- Restriction of use of products: No Data

1.3. Manufacturer/Importer/Distributor

- Company Name: : DAEYOUCORE
- address: : 13, jangin-ro 78beon-gil, sasang-gu,busan 617-843 korea
- Telephone: : (82 51)313-4270~2

2. Hazard · risk

2.1. Hazard and risk classification: Oxidation gas : Part 1
High Pressure Gas : Compressed Gas

2.2. Warning signs including preventive action statements

Pictograph



- Signal language: The Dangers
- Dangerous and dangerous phrase: H270 May cause fire or intense fire ; oxidization
  H280 Contains high pressure gas ; may explode if heated
- Precautionary clause
- Prevention: P220 Isolate from clothing, (··) and combustible materials.
  P244 Make sure that no grease and oil is smeared in the valve and fittings.
- Response: P370+P376 Prevent leakage if it is safe to dispose of in a fire.
- Storage: P403 Store in well-ventilated place.
  P410+P403 Avoid direct sunlight and store in well ventilated areas.
- Disposal: Not applicable

NITROGEN

- Health: 3
- Fire: 0
- Reactivity: 0

Oxygen

- Health: 3
- Fire: 0
- Reactivity: 0

3. Name and content of components

Substance of substance	alias name	CAS	Content(%)
Nitrogen		7727-37-9	79
Oxygen	Oxygen, compressed [UN1072] [Nonflammable gas])	7782-44-7	21
	Oxygen, refrigerated liquid (cryogenic liquid) [UN1073] [Nonflammable gas])		

4. First aid procedure

4.1. When I got into the eyes,	Get emergency medical attention.
4.2. When contact comes into contact with skin	Get emergency medical attention.
	Remove contaminated clothing and shoes and isolate the contaminated area.
	Dissolve the affected area with lukewarm water when contacting liquid gas.
4.3. When inhaled	Move to the fresh air.
	Perform CPR if you do not breathe.
	Provide oxygen if breathing is difficult.
	Keep warm and stabilize.
4.4. When eating	Get emergency medical attention.
4.5. Other doctors ' notes	Ensure that the medical personnel are aware of the material and take protective measures.

5. Fire handling method

5.1. Suitable (inappropriate) fire extinguishing agents

Use alcohol foam, carbon dioxide or water spray when dealing with this substance

Use dry sand or soil during vaginal digestion

5.2. Specific hazards arising from chemical substances

A fire caused by fire or intensity ; oxidization

Contains high pressure gas ; may explode if heated

May cause fire in contact with other flammable materials

May ignite flammable substances (wood, paper, oil, clothing etc.)

Container may explode when heating

Leakage of fire / explosion risk

Some burns but do not ignite easily.

Non-burnt combustion

Some may ignite flammable substances with oxidising agents

May cause irritation, corrosive and toxic fumes during fires

Be careful not to leave any flammable residue after evaporation.

5.3. Protective gear and precautions to be worn during firefighting

Nitrogen

Keep away from the area and keep it safe.

Be careful not to breathe because liquefied gas vapor is heavier than air.

Take care that the damaged cylinder can fly.

Move the container in the fire area if it is not dangerous.

Do not spray directly onto the source or safety device as it may cause freezing in the tank.

Use fire extinguishing equipment or use unmanned extinguishing equipment during tank fires.

Cool the tank with plenty of water after digesting the fire in the tank.

Evacuate immediately if there is a high noise in the discharge unit or if the tank discounts the tank.

Stand out of a tank filled with flames in a tank fire.

Handle broken cylinders only by experts.

Use fire extinguisher suitable for fire types.

Oxygen

Prevent leakage if it is safe to dispose of in a fire.

Keep away from the area and keep it safe.

Be careful not to breathe because liquefied gas vapor is heavier than air.

Take care that the damaged cylinder can fly.

Move the container in the fire area if it is not dangerous.

Oxygen	Do not spray directly onto the source or safety device as it may cause freezing in the tank. Use fire extinguishing equipment or use unmanned extinguishing equipment during tank fires. Cool the tank with plenty of water after digesting the fire in the tank. Evacuate immediately if there is a high noise in the discharge unit or if the tank discounts the tank. Stand out of a tank filled with flames in a tank fire. Use unmanned fire extinguishing equipment for large fires in case of fire and let stand if impossible. Handle broken cylinders only by experts. Use fire extinguisher suitable for fire types.

6.To deal with leakage during a leakage accident

6.1. Necessary actions and protective measures needed to protect the human body	If possible, turn the leak container to allow it to be discharged by gas rather than liquid. Isolate the contaminated area until the gas is completely dispersed and diluted. Stay away from flammable substances and leaks. Do not touch or walk around. Do not spray directly onto the leak source. Use water spray to reduce vapors or disperse steam clouds so that the water does not come into contact with water. Let the matter disperse. Vent the contaminated area. Stop leaking if it is not dangerous. Be careful not to leave any flammable residue after evaporation. Be aware of the substance and conditions to avoid.
6.2.Necessary measures to protect the environment	Prevent entry into waterways, sewers, basements, and closed spaces.
6.3. Methods for cleaning or removing	Build up the dike and collect water for digestion. Do not use combustible materials such as sawdust.

7. Handling and storing methods

7.1.Safety tips	Make sure that no grease and oil is smeared in the valve and fittings. Do not expose, cut, weld, pierce, pierce, pierce, or otherwise expose to light, flame, flame, static or other sources of ignition, flame, or other ignition sources. Follow all MSDS preventive precautions since the container may remain empty even after the container has been emptied. Be aware of the substance and conditions to avoid. Refer to engineering management and personal protective equipment.
7.2. Safe Storage Method	Isolate from clothing, (‥) and combustible materials. Avoid direct sunlight and store in well ventilated areas. Do not expose the container to heat as it may cause heat to rise when exposed to heat.

8.Exposure prevention and personal protective equipment

8.1. Exposure criteria for chemical substances, biological exposure criteria, etc.

Domestic regulations	
Nitrogen	No Data
Oxygen	No Data
ACGIH Regulation	
Nitrogen	Simple suffocate
Oxygen	No Data

Biological exposure criteria	
Nitrogen	No Data
Oxygen	No Data
8.2. Personal protective equipment	
Respiratory protection	
Nitrogen	Wear respiratory protection that is certified by the Korea Occupational Safety & Health Agency certified by the Physical Chemical Properties of the exposed substance.
Oxygen	Wear respiratory protection that is certified by the Korea Occupational Safety & Health Agency certified by the Physical Chemical Properties of the exposed substance.

9. Physicochemical characteristics

9.1. The external appearance	
Persona non grata	No Data
Color	No Data
9.2. Smell	No Data
9.3. Olfactory threshold	No Data
9.4. pH	No Data
9.5. Melting point / freezing point	No Data
9.6. Early boiling point and boiling point	No Data
9.7. Flash point	No Data
9.8. Rate of evaporation	No Data
9.9. Flammable (solid, gas)	No Data
9.10. Upper / lower limit of flammability or explosive range	No Data
9.11. Vapor pressure	No Data
9.12. Solubility	No Data
9.13. Steam density	No Data
9.14. the specific gravity	No Data
9.15. N-oxygenoliphyte factor	No Data
9.16. Spontaneous combustion temperature	No Data
9.17. Decomposition temperature	No Data
9.18. Viscosity	No Data
9.19. Molecular weight	No Data

Nitrogen

9.1. The external appearance	
Persona non grata	Gas
Color	Achromatism
9.2. Smell	Muchwihada odorless
9.3. Olfactory threshold	No Data
9.4. pH	No Data
9.5. Melting point / freezing point	-210 ℃
9.6. Early boiling point and boiling point	-196 ℃ (-195.79 DEG C /LIQ/ (NLM;HSDB))
9.7. Flash point	No Data
9.8. Rate of evaporation	No Data
9.9. Flammable (solid, gas)	No Data
9.10. Upper / lower limit of flammability or explosive range	- / -
9.11. Vapor pressure	1 atm (77.347 deg K)
9.12. Solubility	(1.18E+004mg/L(25℃))
9.13. Steam density	0.97 ((air = 1))
9.14. the specific gravity	0.808 (kg/l at the boiling point of liquid)
9.15. N-oxygenoliphyte factor	0.67

9.16. Spontaneous combustion temperature	No Data
9.17. Decomposition temperature	No Data
9.18. Viscosity	No Data
9.19. Molecular weight	28.0

Oxygen

9.1. The external appearance	
Persona non grata	Gas (compressed gas, frozen liquid gas)
Color	Blue, pale.
9.2. Smell	Muchwihada odorless
9.3. Olfactory threshold	(N/A)
9.4. pH	(None)
9.5. Melting point / freezing point	-218 ℃
9.6. Early boiling point and boiling point	-183 ℃
9.7. Flash point	No Data
9.8. Rate of evaporation	No Data
9.9. Flammable (solid, gas)	No Data
9.10. Upper / lower limit of flammability or	- / -
9.11. Vapor pressure	760 ㎜Hg (-183 ℃)
9.12. Solubility	(3.1㎖/100㎖(20℃))
9.13. Steam density	1.1 (Air = 1)
9.14. the specific gravity	1.1407 (-183 ℃)
9.15. N-oxygenoliphyte factor	0.65
9.16. Spontaneous combustion temperature	(N/A)
9.17. Decomposition temperature	No Data
9.18. Viscosity	0.156 cP (-173 C)
9.19. Molecular weight	32.00

10. Stability and responsiveness

10.1. Possibility of chemical stability and hazardous reactions

Nitrogen	Contains high pressure gas ; may explode if heated
	Container may explode when heating
	Non-existing
	Vapor can cause dizziness or suffocation without awareness
Oxygen	A fire caused by fire or intensity ; oxidization
	Contains high pressure gas ; may explode if heated
	May cause fire in contact with other flammable materials
	May ignite flammable substances (wood, paper, oil, clothing etc.)
	Container may explode when heating
	Leakage of fire / explosion risk
	Some react violently with fuel.
	Non-burnt combustion
	Vapor can cause dizziness or suffocation without awareness
	May cause irritation and toxic fumes during fire

10.2. Conditions to Avoid

Nitrogen	Heat
Oxygen	Heat

10.3. Substance to be avoided

Nitrogen	No Data
Oxygen	Isolate from clothing, (‥) and combustible materials.
Oxygen	Combustible substances (wood, paper, oil, clothing, etc.)
Oxygen	Fuel
Oxygen	Reductive substance

라. Hazardous Substances Created by Disassembly

Nitrogen	No Data
Oxygen	Irritant, toxic gas

11. Information about toxicity

11.1. Information about the likelihood of a highly probable exposure

Nitrogen	No Data
Oxygen	Irresponsiveness, temperature, heat, irregular heart, dizziness, irregular heart rate, dizziness, disorientation, disorientation, tremors, severe pain, tremors, lung congestion, spasm, lung pain, spasm, lung failure

11.2. Health hazard information

Acute toxicity

epigram

Nitrogen	No Data
Oxygen	No Data

Scleroderma

Nitrogen	No Data
Oxygen	No Data

Inhalation

Nitrogen	No Data
Oxygen	No Data

Skin corrosive or irritant

Nitrogen	Skin, Eye and respiratory Irritations: Contact with liquid may cause frostbite & severe skin burns. /Nitrogen, refrigerated liquid
Oxygen	No Data

Severe eye injury or irritation

Nitrogen	Skin, Eye and respiratory Irritations: Contact with liquid may cause frostbite & severe skin burns. /Nitrogen, refrigerated liquid
Oxygen	No Data

Respiratory hyperesthesia

Nitrogen	No Data
Oxygen	No Data

Dermatology

Nitrogen	No Data
Oxygen	No Data

Carcinogenesis

Occupational Safety and Health Act

Nitrogen	No Data
Oxygen	No Data

Employment Bureau of Employment and Labor

Nitrogen	No Data
Oxygen	No Data

IARC

Nitrogen	No Data
Oxygen	No Data

OSHA

Nitrogen	No Data
Oxygen	No Data

ACGIH

Nitrogen	No Data

Oxygen	No Data
NTP	
Nitrogen	No Data
Oxygen	No Data
EU CLP	
Nitrogen	No Data
Oxygen	No Data
Gonadocytogenesis	
Nitrogen	No Data
Oxygen	No Data
Reproductive toxicity	
Nitrogen	No Data
Oxygen	No Data
Specific target organ toxicity (once exposed)	
Nitrogen	Liquid may cause frostbite
Oxygen	No Data
Specific target organ toxicity (repeated exposure)	
Nitrogen	No Data
Oxygen	No Data
Sucking hazard	
Nitrogen	No Data
Oxygen	No Data

12. Environmental impact

12.1. Ecological toxicity

Fish	
Nitrogen	No Data
Oxygen	LC50 440.691 ㎎/ℓ 96 hr
Crustacean	
Nitrogen	No Data
Oxygen	LC50 430.164 ㎎/ℓ 48 hr
bird	
Nitrogen	No Data
Oxygen	EC50 248.819 ㎎/ℓ 96 hr

12.2. Residual and degradable

Residual	
Nitrogen	log Kow 0.67
Oxygen	log Kow 0.65
resolvability	
Nitrogen	No Data
Oxygen	No Data

12.3. Biological enrichment

Enrichment	
Nitrogen	No Data
Oxygen	(Biological enrichment)
Biodegradable goods	
Nitrogen	No Data
Oxygen	No Data

12.4. Soil mobility

Nitrogen	No Data
Oxygen	No Data

12.5. Other Harmful Effects

Nitrogen	No Data
Oxygen	No Data

13. Disposal Notes Disposal

13.1. Methods of disposal

Nitrogen	Dispose of contents and containers according to the regulations stipulated in the Wastes Control Act.
Oxygen	Dispose of contents and containers according to the regulations stipulated in the Wastes Control Act.

13.2. Disposal Notes Disposal

Nitrogen	Consider the cautions specified in the Regulation as stipulated in the Waste Management Act.
Nitrogen	Consider the cautions specified in the Regulation as stipulated in the Waste Management Act.
Oxygen	Consider the cautions specified in the Regulation as stipulated in the Waste Management Act.
Oxygen	Consider the cautions specified in the Regulation as stipulated in the Waste Management Act.

14. Information Required for Transport

14.1. UN No.

Nitrogen	1066
Oxygen	1072

14.2. Enemy boat name

Nitrogen	NITROGEN, COMPRESSED
Oxygen	OXYGEN, COMPRESSED

14.3. Risk class of transport

Nitrogen	2.2
Oxygen	2.2

14.4. Container grade

Nitrogen	-
Oxygen	-

14.5. Marine pollutants

Nitrogen	No Data
Oxygen	No Data

14.6. Special safety measures that require users to know or require transportation or transportation

Emergency measures in case of fire

Nitrogen	F-C
Oxygen	F-C

Emergency emergency measures

Nitrogen	S-V
Oxygen	S-W

15. Legal Status of Legal Regulations

15.1. Regulation by Occupational Safety and Health Act

Nitrogen	No Data
Oxygen	No Data

15.2. Regulation by chemicals management

Nitrogen	No Data
Oxygen	No Data

15.3. Regulation by Safety Management Act

Nitrogen	No Data
Oxygen	No Data

15.4. Regulation by waste management law

Nitrogen	No Data
Oxygen	Designated waste

15.5. Other domestic and foreign laws

Domestic regulation

Persistent Organic Pollutants Management Act

Nitrogen	No Data
Oxygen	No Data

Foreign regulation

U.S. Management Information (OSHA Regulation)

Nitrogen	No Data
Oxygen	No Data

U.S. Management Information (CERCLA Rules)

Nitrogen	No Data
Oxygen	No Data

U.S. Management Information (EPCRA02 Rules)

Nitrogen	No Data
Oxygen	No Data

U.S. Management Information (EPCRA 304)

Nitrogen	No Data
Oxygen	No Data

U.S. Management Information (EPCRA 313 Rules)

Nitrogen	No Data
Oxygen	No Data

U.S. Management Information (Rotterdam Convention)

Nitrogen	No Data
Oxygen	No Data

U.S. Management Information (Stockholm Convention Material)

Nitrogen	No Data
Oxygen	No Data

U.S. Management Information (Montreal Protocol)

Nitrogen	No Data
Oxygen	No Data

EU Classification Information (Final Classification Result)

Nitrogen	No Data
Oxygen	O; R8

European Classification Information (Hazardous signs)

Nitrogen	No Data
Oxygen	R8

European Classification Information (Safety Statement)

Nitrogen	No Data
Oxygen	S2, S17

16. Other Notes

16.1. Source of data

NITROGEN

National Library of Medicine/Hazardous Substances Data Bank(NLM/HSDB)(http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB)(ikon)

National Library of Medicine/Hazardous Substances Data Bank(NLM/HSDB)(http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB)(smell)

International Chemical Safety Cards (ICSC)(http://www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/index.htm)(Melting point / freezing point)

International Chemical Safety Cards (ICSC)(http://www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/index.htm) (Early boiling point and boiling point)

National Library of Medicine/Hazardous Substances Data Bank(NLM/HSDB) (http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB)(Medium pressure pressure)

SRC(Solubility)

International Chemical Safety Cards (ICSC)(http://www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/index.htm)(Steam density)

International Chemical Safety Cards (ICSC)(http://www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/index.htm)(weight)

National Library of Medicine/Hazardous Substances Data Bank(NLM/HSDB) (http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB)(N-oxygenoliphyte factor)

Corporate Solution From Thomson Micromedex(http://csi.micromedex.com)(Molecular weight)

National Library of Medicine/Hazardous Substances Data Bank(NLM/HSDB) (http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB)(Skin corrosive or irritant)

National Library of Medicine/Hazardous Substances Data Bank(NLM/HSDB) (http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB) (Severe eye injury or irritation)

International Chemical Safety Cards (ICSC)(http://www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/index.htm) (Specific target organ toxicity (once exposed))

National Library of Medicine/Hazardous Substances Data Bank(NLM/HSDB)(http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB)(Residual)

Oxygen

ICSC(Solubility)

ICSC(Steam density)

ICSC(weight)

ICSC(N-oxygenoliphyte factor)

HSDB(Viscosity)

ECOSAR(Fish)

ECOSAR(Crustacean)

ECOSAR(bird)

ICSC(Stay away from)

HSDB(Enrichment)

16.2 .Initial date of preparation 2017-10-13

16.3. Number of amendments and final revision date

Number of revisions	3 times
Final Revision Date	2022-03-07

16.4. etc.

- SAFETY written material was edited by reference, modify the data provided by the Korea Occupational Safety and Health Agency
- MSDS are available for internal use, Prohibit commercial use

SAFETY DATA SHEET

According to OSHA Hazcom Standard 29 CFR 1910.1200

UT6780(H)(S)-RAL7032(HS)

1. IDENTIFICATION

A. Product name

- UT6780(H)(S)-RAL7032(HS)

B. Recommended use and restriction on use

- General use : urethane top coat
- Restriction on use : Do not use except for purpose

C. Manufacturer / Supplier / Distributor information

○ Manufacturer information

- Company name : KCC Corporation
- Address : 30, Bangeojinsunhwando-ro, Dong-gu, Ulsan
- Emergency telephone number : 82-52-280-1717

○ Supplier/Distributer information

- Company name : KCC Corporation
- Address : 30, Bangeojinsunhwando-ro, Dong-gu, Ulsan
- Emergency telephone number : 82-52-280-1717

2. HAZARD IDENTIFICATION

A. GHS Classification

- Flammable liquids : Category3
- Acute toxicity (oral) : Category5
- Acute toxicity (inhalation: vapor) : Category4
- Skin corrosion/irritation : Category2
- Serious eye damage/irritation : Category2
- Skin sensitization : Category1A
- Carcinogenicity : Category2
- Reproductive toxicity : Category2
- Specific target organ toxicity(Single exposure) : Category3(Narcotic effects)
- Specific target organ toxicity(Single exposure) : Category3(Respiratory tract irritation)
- Specific target organ toxicity(Repeated exposure) : Category2
- Aspiration hazard : Category1
- Acute aquatic toxicity : Category2

B. GHS label elements

○ Hazard symbols



○ Signal words

- Danger

○ Hazard statements

- H226 Flammable liquid and vapour
- H303 May harmful if swallowed.
- H304 May be fatal if swallowed and enters airways
- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H319 Causes serious eye irritation
- H332 Harmful if inhaled
- H335 May cause respiratory irritation.
- H336 May cause drowsiness and dizziness.
- H351 Suspected of causing cancer
- H361 Suspected of damaging fertility or the unborn child
- H373 May cause damage to organs through prolonged or repeated exposure
- H401 Toxic to aquatic organisms.

○ 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, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P233 Keep container tightly closed.
- P240 Ground and bond container and receiving equipment.
- P241 Use explosion-proof electrical/ventilating/lighting/equipment.
- P242 Use non-sparking tools.
- P243 Take action to prevent static discharges.
- P260 Do not breathe dust/fume/gas/mist/vapours/spray.
- P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
- P264 Wash hands thoroughly after handling.
- 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/hearing protection.

2) Response

- P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- 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.
- 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 or concerned: Get medical advice/attention.

- P312 Call a POISON CENTER or doctor/physician if you feel unwell.
- P314 Get medical advice/attention if you feel unwell.
- P321 Specific treatment
- P331 Do NOT induce vomiting.
- 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+P364 Take off contaminated clothing and wash before reuse.
- P370+P378 In case of fire: Use Suitable extinguishing media for extinction(Refer Section MSDS 5).

3) Storage

- P403+P233 Store in a well-ventilated place. Keep container tightly closed.
- 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

- Not available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
Xylene	Xylol ; Methyltoluene	1330-20-7	19 ~ 26
Titanium dioxide	Titanium oxide (Tio2) ; Titanium peroxide (Tio2) ; Dioxotitanium ; Pigment white 6	13463-67-7	19 ~ 26
Pyrophyllite	Not available	12269-78-2	4 ~ 11
Talc(Containing no asbestos fibers)	Talc (Mg3H2(SiO3)4)	14807-96-6	4 ~ 11
n-Butyl acetate	Acetic acid, butyl ester ; 1-Butyl acetate ; Butyl acetate ; Acetic acid N-butyl ester ; Butyl ethanoate ; 1-Acetoxybutane	123-86-4	1 ~ 8
Ethylbenzene	Benzene, ethyl- ; Ethyl benzene ; Ethylbenzol ; Phenylethane ;	100-41-4	1 ~ 8
Styrene, 2-hydroxyethyl methacrylate, methyl methacrylate, methacrylic acid, n-butyl acrylate, diethylaminoethyl methacrylate, n-butyl methacrylate, fumaric acid copolymer with glycidyl neodecanoate	Not available	190524-92-6	1 ~ 8
Propylene glycol methyl ether acetate	Propylene glycol monomethyl ether acetate ; 2-(1-Methoxy)propyl acetate ; 1-Methoxypropan-2-yl acetate ;	108-65-6	1 ~ 6
Iron hydroxide oxide yellow (C.I. pigment yellow 042)	FERRIC OXIDE, FERRIC HYDROXIDE, CALCIUM CARBONATE ; FERRIC OXIDE, FERRIC HYDROXIDE, CALCIUM CARBONATE ;	51274-00-1	1 ~ 6
Silicon dioxide	Precipitated silica ; Silica, amorphous, precipitated and gel ; Silica gel, precipitated, crystalline free ; Amorphous synthetic silica gel ; Pptd. crystalline-free silica sol ;	112926-00-8	1 ~ 6
Toluene	Methylbenzene ; Methylbenzol ; Phenyl methane ; Methacide ; Toluol ; 1-Methylbenzene	108-88-3	0.1~1
Dihydro-3-(tetrapropenyl)-2,5-furandione	2-DODECEN-1-YLSUCCINIC ANHYDRIDE	26544-38-7	0.1~1

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.
- 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.
- Wash contaminated clothing thoroughly before re-using.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- Wash thoroughly after handling.

C. Inhalation contact

- Take specific treatment if needed.
- When exposed to large amounts of steam and mist, move to fresh air.
- 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.
- If swallowed, large amounts of water to drink and do not induce vomiting.

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

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

B. Specific hazards arising from the chemical

- Causes serious eye irritation
- Causes skin irritation
- Flammable liquid and vapour
- Harmful if inhaled
- May be fatal if swallowed and enters airways

C. Special protective actions for firefighters

- Avoid inhalation of materials or combustion by-products.
- Cool containers with water until well after fire is out.
- Do not approach the tank surrounded by fire until it is extinguished.
- In case of conflagration, use automatic fire sprinkler. Major fire may require withdrawal, allowing the object itself to burn.
- Keep unauthorized personnel out.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures

- Do not touch spilled material. Stop leak if you can do it without risk.

- Handle the damaged containers or spilled material after wearing appropriate protective equipment
- Move container to safe area from the leak area.
- Must work against the wind, let the upwind people to evacuate.
- Remove all sources of ignition.

B. Environmental precautions

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

C. Methods and materials for containment and cleaning up

- Appropriate container for disposal of spilled material collected.
- Dike for later disposal.
- Disposal of waste shall be in compliance with the Wastes Control Act
- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notify the central and local government if the emission reach the standard threshold.

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Avoid contact with incompatible materials.
- Avoid direct physical contact.
- Comply with all applicable laws and regulations for handling
- Dealing only with a well-ventilated place.
- Do not handle until all safety precautions have been read and understood.

B. Conditions for safe storage, including any incompatibilities

- Avoid direct sunlight.
- Check regularly for leaks.
- Do not apply any physical shock to container.
- Do not apply direct heat.
- Do not use damaged containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits

○ ACGIH TLV

- [Xylene] : TWA 20 ppm
- [Titanium dioxide] : TWA 0.2 mg/m3 (Nanoscale particles), 2.5 mg/m3 (Finescale particles)
- [Talc(Containing no asbestos fibers)] : TWA 2 mg/m3, Respirable particulate matter (containing no asbestos and <1% crystalline silica)
- [n-Butyl acetate] : TWA 50 ppm , STEL 150 ppm
- [Ethylbenzene] : TWA, 20 ppm (87 mg/m3)
- [Toluene] : TWA 20 ppm (75 mg/m3)

○ OSHA PEL

- [Xylene] : 100 ppm, 435 mg/m3
- [Titanium dioxide] : 15 mg/m3 (Total dust)
- [n-Butyl acetate] : 150 ppm, 710 mg/m3
- [Ethylbenzene] : 100 ppm, 435 mg/m3
- [Silicon dioxide] : 80 mg/m3(%SiO2)
- [Toluene] : 200 ppm, (C) 300 ppm

B. Engineering controls

- Business owner is recommended to maintain below recommended exposure limits for the working place with general exhaust of gas/vapour/mist/fume.

C. Individual protection measures, such as personal protective equipment

○ Respiratory protection

- Any air-purifying respirator with a full facepiece and an organic vapor canister.
- Any chemical cartridge respirator with a full facepiece and organic vaporcartridge(s).
- Any chemical cartridge respirator with organic vapor cartridge(s).
- Consider warning properties before use.
- 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.
- Respiratory protection is ranked in order from minimum to maximum.
- Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.

○ Eye protection

- Provide an emergency eye wash station and quick drench shower in the immediate work area.
- Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.

○ 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
- Color	BEIGE
B. Odor	Solvent odor
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	Not available
F. Initial Boiling Point/Boiling Ranges	Not available
G. Flash point	23℃
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	Not available
M. Vapour density	>1
N. Specific gravity(Relative density)	1.3 ~ 1.38
O. Partition coefficient of n-octanol/water	Not available
P. Autoignition temperature	408
Q. Decomposition temperature	Not available
R. Viscosity	65 ~ 70 KU
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

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

C. Conditions to avoid

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

D. Incompatible materials

- Sparks, flames, static electricity, strong acids and base substances

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

- May be fatal if swallowed and enters airways
- May cause respiratory irritation.

○ Oral

- May 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
- [Xylene] : LD50 3523 mg/kg Rat (EU Method B.1) (ECHA)
- [Titanium dioxide] : LD50 >5000 ㎎/㎏ Mouse (OECD TG 420) (OECD SIDS)
- [Talc(Containing no asbestos fibers)] : LD50 >5000 ㎎/㎏ Rat (OECD TG 423, GLP)(ECHA)
- [n-Butyl acetate] : LD50 10760 mg/kg Rat (12.2 mL/kg) (OECD TG 423) (ECHA)
- [Ethylbenzene] : LD50 3500 mg/kg Rat (ECHA)
- [Propylene glycol methyl ether acetate] : LD50 6190 mg/kg Rat (OECD TG 401, GLP) (ECHA)
- [Iron hydroxide oxide yellow (C.I. pigment yellow 042)] : LD50 >10000 ㎎/㎏ Rat (ECHA)
- [Silicon dioxide] : LD50 > 3300 ㎎/㎏ Rat (OECD Guideline 401, GLP)(ECHA)
- [Toluene] : LD50 5580 mg/kg Rat (EU Method B.1) (ECHA)
- [Dihydro-3-(tetrapropenyl)-2,5-furandione] : LD50 2550 ㎎/㎏ Rat (NLM; ChemIDplus)

* Dermal

- Product (ATEmix) : >5000mg/kg
- [Xylene] : LD50 12126 mg/kg Rabbit (ECHA)
- [Talc(Containing no asbestos fibers)] : LD50 >2000 ㎎/㎏ Rat (OECD TG 402, GLP)(ECHA)
- [n-Butyl acetate] : LD50 > 14112 mg/kg Rabbit (> 16 mL/kg) (OECD TG 402) (ECHA)
- [Ethylbenzene] : LD50 15432 mg/kg (17.8 mL/kg) Rabbit (ECHA)
- [Propylene glycol methyl ether acetate] : LD50 > 5000 mg/kg Rabbit (IUCLID)
- [Silicon dioxide] : LD50 > 5000 ㎎/㎏ Rat (ECHA)
- [Toluene] : LD50 > 5000 mg/kg Rabbit (ECHA)
- [Dihydro-3-(tetrapropenyl)-2,5-furandione] : LD50 6220 ㎎/㎏ Rabbit NLM; ChemIDplus

* Inhalation

- Product (ATEmix) : 10.0mg/L 4hr < ATEmix <= 20.0mg/L 4hr
- [Xylene] : Vapor LC50 10~20 mg/L 4 hr (NIER)

- [Titanium dioxide] : Aerosol LC50 5.09 mg/L 4h Rat No death, Not classified (ECHA)
- [Talc(Containing no asbestos fibers)] : Dust LC50 >2.1 ㎎/ℓ 4 hr Rat No death (OECD TG 403, GLP)(ECHA)
- [n-Butyl acetate] : Vapor LC50 > 6.6 mg/L 4 hr Rat No death Not classified (OECD TG 403, GLP) (ECHA)
- [Ethylbenzene] : Vapor LC50 10~20 mg/L 4 hr (EU Harmonized Cat. 4) (ECHA)
- [Propylene glycol methyl ether acetate] : Vapor LC0 >23.3 mg/L/4h, LC0 > 1732ppm 4hr (> 2000 ppm 3hr) Rat No death Not classified (ECHA)
- [Iron hydroxide oxide yellow (C.I. pigment yellow 042)] : LC50 5.05 ㎎/ℓ 4 hr Rat (OECD Guideline 403, GLP)(ECHA)
- [Silicon dioxide] : Dust LC50 > 2.08 ㎎/ℓ 4 hr Rat (Amorphous silica (CAB-O-SIL M5)_SIDS (2006))
- [Toluene] : Vapor LC50 28.1 mg/L 4 hr Rat (OECD TG 403) (ECHA)

○ 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
  - [Xylene] : Group 3
  - [Titanium dioxide] : Group 2B
    ※ IARC (International Agency for Research on Cancer) has classified TiO2 as a substance which may be possibly carcinogenic to humans. However, studies on TiO2 conducted by the IARC state that when TiO2 is mixed in substance such as paints and coatings, the level of exposure is not severe. An increase in cancer was found only when ultrafine TiO2 particles of less than 100nm were used in a Study on Long-term Inhalation of TiO2 by Animals, issued by the National Institute for Occupational Safety & Health (NIOSH). Therefore, it is difficult to conclude that this product, which contains TiO2 with a particle size of 280~360nm, can be carcinogenic enough to cause cancer.
  - [Talc(Containing no asbestos fibers)] : Group 3
  - [Ethylbenzene] : Group 2B
  - [Silicon dioxide] : Group 3 (Silica, amorphous)
  - [Toluene] : Group 3
* OSHA
  - Not available
* ACGIH
  - [Xylene] : A4
  - [Titanium dioxide] : A3
  - [Talc(Containing no asbestos fibers)] : A4 (Talc(containing no asbestos fibers))
  - [Ethylbenzene] : A3
  - [Toluene] : A4
* NTP
  - Not available
* EU CLP
  - [Titanium dioxide] : Carc. 2

○ Germ cell mutagenicity

- Not available

○ Reproductive toxicity

- Suspected of damaging fertility or the unborn child

○ STOT-single exposure

- May cause drowsiness and dizziness.
- May cause respiratory irritation.

○ STOT-repeated exposure

- May cause damage to organs through prolonged or repeated exposure

○ Aspiration hazard

- May be fatal if swallowed and enters airways

12. ECOLOGICAL INFORMATION

A. Ecotoxicity

○ Fish

- [Xylene] : LC50 7.6 mg/L 96 hr Oncorhynchus mykiss (OECD TG 203) (ECHA)
- [Titanium dioxide] : LC50 >100 ㎎/L 96 hr Carassius auratus, Oncorhynchus mykiss (ECHA)
- [n-Butyl acetate] : LC50 18 mg/L 96 hr Pimephales promelas (OECD TG 203) (ECHA)
- [Ethylbenzene] : LC50 5.1 mg/L 96 hr Menidia menidia (ECHA)
- [Propylene glycol methyl ether acetate] : LC50 100~180 mg/L 96 hr Oncorhynchus mykiss (OECD TG 203), NOEC 47.5 mg/L 14 d Oryzias latipes (OECD TG 204, GLP) (ECHA)
- [Silicon dioxide] : LC50 10000 ㎎/ℓ 96 hr (Danio rerio, (OECD TG203, GLP)(ECHA)
- [Toluene] : LC50 5.5 mg/L 96 hr, NOEC 1.39 mg/L 40 d Oncorhynchus kistutch (ECHA)

○ Crustaceans

- [Xylene] : NOEC 1.17 mg/L 7 d Ceriodaphnia dubia (ECHA)
- [Titanium dioxide] : EC50 >100 ㎎/L 48 hr Daphnia magna, OECD TG 202 (ECHA)
- [n-Butyl acetate] : EC50 44 mg/L 48 hr Daphnia sp. (OECD TG 202), NOEC 23.2 mg/L 21 d Daphnia magna (OECD TG 211, GLP, Read-across CAS No. 110-19-0) (ECHA)
- [Ethylbenzene] : EC50 1.8~2.4 mg/L 48 hr Daphnia magna, NOEC 0.96 mg/L 7 d Ceriodaphnia dubia (ECHA)
- [Propylene glycol methyl ether acetate] : EC50 408 mg/L 48 hr Daphnia magna (OECD TG 202, GLP), NOEC >= 100 mg/L 21 d Daphnia magna (OECD TG 211, GLP) (ECHA)
- [Iron hydroxide oxide yellow (C.I. pigment yellow 042)] : LC50 ≥ 100 ㎎/ℓ 48 hr Daphnia magna (GLP, ECHA)
- [Silicon dioxide] : EC50 >1000 ㎎/ℓ 24 hr Daphnia magna(OECD TG202)(ECHA)
- [Toluene] : EC50 3.78mg/L 48hr, NOEC 0.74 mg/L 7 d Ceriodaphnia dubia (ECHA)

○ Algae

- [Xylene] : EC50 4.7 mg/L 72 hr Raphidocelis subcapitata (OECD TG 201) (ECHA)
- [Titanium dioxide] : ErL50 > 100 ㎎/ℓ 72 hr Pseudokirchneriella subcapitata, growth rate, static, (72h-EyL50 >100 mg/L static, OECD TG 201) (ECHA)
- [n-Butyl acetate] : EC50 392 mg/L 48 hr, NOEC 196 mg/L 48 hr Raphidocelis subcapitata (OECD TG 201, GLP) (Read-across CAS No. 110-19-0) (ECHA)
- [Ethylbenzene] : EC50 3.6 mg/L 96 hr, NOEC 3.4 mg/L 96 hr Raphidocelis subcapitata (ECHA)
- [Propylene glycol methyl ether acetate] : EC50 >1000 mg/L 72 hr, NOEC >= 1000 mg/L 96 hr Raphidocelis subcapitata (OECD TG 201) (ECHA)
- [Iron hydroxide oxide yellow (C.I. pigment yellow 042)] : EC50 18 ㎎/ℓ 72 hr Pseudokirchneriella subcapitata (ECHA)
- [Silicon dioxide] : EC50 >10000 ㎎/ℓ 72 hr (Desmodesmus subspicatus, OECD TG201, GLP)(ECHA)
- [Toluene] : EC50 134 mg/L 3 hr Chlorella vulgaris and Chlamydomonas angulosa (ECHA)

B. Persistence and degradability

○ Persistence

- [Xylene] : log Pow 3.12 (ECHA)
- [n-Butyl acetate] : log Pow 2.3 (25°C) (OECD TG 117, GLP) (ECHA)
- [Ethylbenzene] : log Pow 3.6 (20 °C) (ECHA)
- [Propylene glycol methyl ether acetate] : log Pow 1.2 (20 °C) (OECD TG 117, GLP) (ECHA)
- [Toluene] : log Pow 2.73 (20 °C) (ECHA)
- [Dihydro-3-(tetrapropenyl)-2,5-furandione] : log Kow >=4.39 (ECHA)

○ Degradability

- Not available

C. Bioaccumulative potential

○ Bioaccumulative potential

- [Ethylbenzene] : BCF 1 (ECHA)
- [Toluene] : BCF 90 (ECHA)

○ Biodegradation

- [Xylene] : 94 % 28 d, Readily biodegradable (OECD TG 301 F, GLP) (ECHA)
- [n-Butyl acetate] : 83 % 28 d, Readily biodegradable (OECD TG 301 D) (ECHA)
- [Ethylbenzene] : 70~ 80 % 28 d, Readily biodegradable (ECHA)
- [Propylene glycol methyl ether acetate] : 83 % 28 d, Readily biodegradable (OECD TG 301 F, GLP) (ECHA)
- [Toluene] : 69 % 5 d, Readily biodegradable (ECHA)
- [Dihydro-3-(tetrapropenyl)-2,5-furandione] : no biodegradation observed (ECHA)

D. Mobility in soil

- [Xylene] : log Koc ca. 2.73 dimensionless (OECD TG 121) (ECHA)
- [Dihydro-3-(tetrapropenyl)-2,5-furandione] : 10280 (Estimate)

E. Other adverse effects

- [Iron hydroxide oxide yellow (C.I. pigment yellow 042)] : Insoluble substances (water solubility 1㎎/ℓ or less (Not classified in acute toxicity)(ECHA)

13. DISPOSAL CONSIDERATIONS

A. Disposal methods

- It shall be treated by incineration
- Oil water separation technology shall be applied as pre-waste treatment if it is applicable
- Stabilization and minimization treatment by incineration or similar method can be applied, if more than two kinds of designated wastes are in mixture state and it is impractical to separate them

B. Special precautions for disposal

- Anyone with business license number who generates industrial wastes shall treat the waste by him/herself or by entrusting to the legal entities who treat the wastes, recycle the wastes of others or install and operate the waste treatment facilities according to the Wastes Control Act
- Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

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

- 1263

B. Proper shipping name

- PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)

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

- [Xylene] : Not applicable
- [Titanium dioxide] : Not applicable
- [Pyrophyllite] : Not applicable
- [Talc(Containing no asbestos fibers)] : Not applicable
- [n-Butyl acetate] : Not applicable
- [Ethylbenzene] : Not applicable
- [Styrene, 2-hydroxyethyl methacrylate, methyl methacrylate, methacrylic acid, n-butyl acrylate, diethylaminoethyl methacrylate, n-butyl methacrylate, fumaric acid copolymer with glycidyl neodecanoate] : Not applicable
- [Propylene glycol methyl ether acetate] : Not applicable
- [Iron hydroxide oxide yellow (C.I. pigment yellow 042)] : Not applicable
- [Silicon dioxide] : Not applicable
- [Toluene] : Not applicable
- [Dihydro-3-(tetrapropenyl)-2,5-furandione] : Not applicable

○ Information of EU Classification

* Classification
  - [Xylene] : H226,H312,H315,H332
  - [n-Butyl acetate] : H226,H336
  - [Ethylbenzene] : H225,H304,H332,H373
  - [Propylene glycol methyl ether acetate] : H226
  - [Toluene] : H225,H304,H315,H336,H361,H373

○ U.S. Federal regulations

* OSHA PROCESS SAFETY (29CFR1910.119)
  - Not applicable

* CERCLA Section 103 (40CFR302.4)
  - [Xylene] : 45.3599 kg 100 lb
  - [n-Butyl acetate] : 2267.995 kg 5000 lb
  - [Ethylbenzene] : 453.599 kg 1000 lb
  - [Toluene] : 453.599 kg 1000 lb
  - [Titanium dioxide] : Not applicable
  - [Pyrophyllite] : Not applicable
  - [Talc(Containing no asbestos fibers)] : Not applicable
  - [Styrene, 2-hydroxyethyl methacrylate, methyl methacrylate, methacrylic acid, n-butyl acrylate, diethylaminoethyl methacrylate, n-butyl methacrylate, fumaric acid copolymer with glycidyl neodecanoate] : Not
  - [Propylene glycol methyl ether acetate] : Not applicable
  - [Iron hydroxide oxide yellow (C.I. pigment yellow 042)] : Not applicable
  - [Silicon dioxide] : Not applicable
  - [Dihydro-3-(tetrapropenyl)-2,5-furandione] : Not applicable

* EPCRA Section 302 (40CFR355.30)
  - Not applicable

* EPCRA Section 304 (40CFR355.40)
  - Not applicable

* EPCRA Section 313 (40CFR372.65)
  - [Xylene] : Applicable
  - [Ethylbenzene] : Applicable
  - [Toluene] : Applicable

- [Titanium dioxide] : Not applicable

- [Pyrophyllite] : Not applicable

- [Talc(Containing no asbestos fibers)] : Not applicable

- [n-Butyl acetate] : Not applicable

- [Styrene, 2-hydroxyethyl methacrylate, methyl methacrylate, methacrylic acid, n-butyl acrylate, diethylaminoethyl methacrylate, n-butyl methacrylate, fumaric acid copolymer with glycidyl neodecanoate] : Not

- [Propylene glycol methyl ether acetate] : Not applicable

- [Iron hydroxide oxide yellow (C.I. pigment yellow 042)] : Not applicable

- [Silicon dioxide] : Not applicable

- [Dihydro-3-(tetrapropenyl)-2,5-furandione] : 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

- 2019-10-11

C. Revision number and Last date revised

- 3 times, 2024-02-07

D. Other

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

SAFETY DATA SHEET

According to OSHA Hazcom Standard 29 CFR 1910.1200

2958(RT)C.A

1. IDENTIFICATION

A. Product name

- 2958(RT)C.A

B. Recommended use and restriction on use

- General use : urethane hardener
- Restriction on use : Do not use except for purpose

C. Manufacturer / Supplier / Distributor information

○ Manufacturer information

- Company name : KCC Corporation
- Address : 30, Bangeojinsunhwando-ro, Dong-gu, Ulsan
- Emergency telephone number : 82-52-280-1717

○ Supplier/Distributer information

- Company name : KCC Corporation
- Address : 30, Bangeojinsunhwando-ro, Dong-gu, Ulsan
- Emergency telephone number : 82-52-280-1717

2. HAZARD IDENTIFICATION

A. GHS Classification

- Flammable liquids : Category3
- Acute toxicity (oral) : Category5
- Acute toxicity (dermal) : Category5
- Acute toxicity (inhalation: vapor) : Category3
- Skin corrosion/irritation : Category2
- Serious eye damage/irritation : Category2
- Respiratory sensitization : Category1
- Skin sensitization : Category1
- Germ cell mutagenicity : Category1B
- Carcinogenicity : Category1B
- Reproductive toxicity : Category2
- Specific target organ toxicity(Single exposure) : Category3(Narcotic effects)
- Specific target organ toxicity(Single exposure) : Category3(Respiratory tract irritation)
- Specific target organ toxicity(Repeated exposure) : Category2
- Aspiration hazard : Category1
- Acute aquatic toxicity : Category3
- Chronic aquatic toxicity : Category3

B. GHS label elements

○ Hazard symbols



○ Signal words

- Danger

○ Hazard statements

- H226 Flammable liquid and vapour
- H303 May harmful if swallowed.
- H304 May be fatal if swallowed and enters airways
- H313 May be harmful if contact with skin.
- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H319 Causes serious eye irritation
- H331 Toxic if inhaled
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H335 May cause respiratory irritation.
- H336 May cause drowsiness and dizziness.
- H340 May cause genetic defects
- H350 May cause cancer
- H361 Suspected of damaging fertility or the unborn child
- H373 May cause damage to organs through prolonged or repeated exposure
- H402 Harmful to aquatic organisms.
- H412 Harmful to aquatic life with long lasting effects

○ 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, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P233 Keep container tightly closed.
- P240 Ground and bond container and receiving equipment.
- P241 Use explosion-proof electrical/ventilating/lighting/equipment.
- P242 Use non-sparking tools.
- P243 Take action to prevent static discharges.
- P260 Do not breathe dust/fume/gas/mist/vapours/spray.
- P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
- P264 Wash hands thoroughly after handling.
- 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/hearing protection.
- P284 In case of inadequate ventilation wear respiratory protection.

2) Response

- P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

- P302+P312 IF ON SKIN: Call a POISON CENTER/doctor 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.

- 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 or concerned: Get medical advice/attention.

- P311 Call a POISON CENTER or doctor/physician.

- P312 Call a POISON CENTER or doctor/physician if you feel unwell.

- P314 Get medical advice/attention if you feel unwell.

- P321 Specific treatment

- P331 Do NOT induce vomiting.

- 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.

- P342+P311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

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

- P370+P378 In case of fire: Use Suitable extinguishing media for extinction(Refer Section MSDS 5).

3) Storage

- P403+P233 Store in a well-ventilated place. Keep container tightly closed.

- 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

- Not available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
1,6-Diisocyanatohexane homopolymer	POLY(HEXAMETHYLENE DIISOCYANATE)	28182-81-2	64 ~ 71
Xylene	Xylol ; Methyltoluene	1330-20-7	16 ~ 23
Propylene glycol methyl ether acetate	Propylene glycol monomethyl ether acetate ; 2-(1-Methoxy)propyl acetate ; 1-Methoxypropan-2-yl acetate ;	108-65-6	1 ~ 8
n-Butyl acetate	Acetic acid, butyl ester ; 1-Butyl acetate ; Butyl acetate ; Acetic acid N-butyl ester ; Butyl ethanoate ; 1-Acetoxybutane	123-86-4	1 ~ 8
Solvent naphtha (petroleum), light arom.	Naphtha	64742-95-6	1 ~ 8
Ethylbenzene	Benzene, ethyl- ; Ethyl benzene ; Ethylbenzol ; Phenylethane ;	100-41-4	1 ~ 6
4-Methylbenzenesulfonyl isocyanate	p-Toluenesulfonic acid,anhydride with isocyanic acid (7CI,8CI)	4083-64-1	0.1~1
Hexamethylene Diisocyanate	1,6-Diisocyanatohexane ; 1,6-Hexamethylene diisocyanate ; 1,6-Hexanediol diisocyanate ; 1,6-Hexylene diisocyanate ; Isocyanic acid, hexamethylene ester ; Hexane-1,6-diisocyanate	822-06-0	0.1~1

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.
- 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.
- Wash contaminated clothing thoroughly before re-using.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- Remove contaminated clothing, shoes and isolate.
- Wash thoroughly after handling.
- Wear gloves when washing the patient, and please avoid contact with contaminated clothing.

C. Inhalation contact

- Take specific treatment if needed.
- When exposed to large amounts of steam and mist, move to fresh air.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- If breathing is stopped or irregular, give artificial respiration and supply oxygen.
- Take the doctor's examination.

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.
- If swallowed, large amounts of water to drink and do not induce vomiting.

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.
- Remove to fresh air and keep at rest in a position comfortable for breathing.

5. FIREFIGHTING MEASURES

A. Suitable (Unsuitable) extinguishing media

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

B. Specific hazards arising from the chemical

- Causes serious eye irritation
- Causes skin irritation
- Flammable liquid and vapour
- Harmful to aquatic life with long lasting effects
- Harmful to aquatic organisms.

C. Special protective actions for firefighters

- Avoid inhalation of materials or combustion by-products.
- Cool containers with water until well after fire is out.
- Do not approach the tank surrounded by fire until it is extinguished.
- In case of conflagration, use automatic fire sprinkler. Major fire may require withdrawal, allowing the object itself to burn.

- Keep unauthorized personnel out.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures

- Do not touch spilled material. Stop leak if you can do it without risk.
- Handle the damaged containers or spilled material after wearing appropriate protective equipment
- Move container to safe area from the leak area.
- Must work against the wind, let the upwind people to evacuate.
- Remove all sources of ignition.

B. Environmental precautions

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

C. Methods and materials for containment and cleaning up

- Appropriate container for disposal of spilled material collected.
- Dike for later disposal.
- Disposal of waste shall be in compliance with the Wastes Control Act
- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notify the central and local government if the emission reach the standard threshold.

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Avoid contact with incompatible materials.
- Avoid direct physical contact.
- Comply with all applicable laws and regulations for handling
- Dealing only with a well-ventilated place.
- Do not handle until all safety precautions have been read and understood.

B. Conditions for safe storage, including any incompatibilities

- Avoid direct sunlight.
- Check regularly for leaks.
- Do not apply any physical shock to container.
- Do not apply direct heat.
- Do not use damaged containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits

○ ACGIH TLV

- [Xylene] : TWA 20 ppm
- [n-Butyl acetate] : TWA 50 ppm , STEL 150 ppm
- [Ethylbenzene] : TWA, 20 ppm (87 mg/m3)
- [Hexamethylene Diisocyanate] : TWA, 0.005 ppm (0.034 mg/m3)

○ OSHA PEL

- [Xylene] : 100 ppm, 435 mg/m3
- [n-Butyl acetate] : 150 ppm, 710 mg/m3
- [Ethylbenzene] : 100 ppm, 435 mg/m3

B. Engineering controls

- Business owner is recommended to maintain below recommended exposure limits for the working place with general exhaust of gas/vapour/mist/fume.

C. Individual protection measures, such as personal protective equipment

○ Respiratory protection

- Any air-purifying respirator with a full facepiece and an organic vapor canister.

- Any chemical cartridge respirator with a full facepiece and organic vaporcartridge(s).
- Any chemical cartridge respirator with organic vapor cartridge(s).
- Consider warning properties before use.
- 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.
- Respiratory protection is ranked in order from minimum to maximum.
- Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.

○ Eye protection

- Provide an emergency eye wash station and quick drench shower in the immediate work area.
- Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.

○ 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
- Color	CLEAR
B. Odor	Solvent odor
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	Not available
F. Initial Boiling Point/Boiling Ranges	Not available
G. Flash point	23℃
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	Not available
M. Vapour density	>1
N. Specific gravity(Relative density)	1.0~1.4
O. Partition coefficient of n-octanol/water	Not available
P. Autoignition temperature	408
Q. Decomposition temperature	Not available
R. Viscosity	15~25 sec
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

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

C. Conditions to avoid

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

D. Incompatible materials

- Sparks, flames, static electricity, strong acids and base substances

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

- May be fatal if swallowed and enters airways
- May cause allergy or asthma symptoms or breathing difficulties if inhaled
- May cause respiratory irritation.

○ Oral

- May 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
- [1,6-Diisocyanatohexane homopolymer] : LD50 > 2500 mg/kg Rat (ECHA)
- [Xylene] : LD50 3523 mg/kg Rat (EU Method B.1) (ECHA)
- [Propylene glycol methyl ether acetate] : LD50 6190 mg/kg Rat (OECD TG 401, GLP) (ECHA)
- [n-Butyl acetate] : LD50 10760 mg/kg Rat (12.2 mL/kg) (OECD TG 423) (ECHA)
- [Solvent naphtha (petroleum), light arom.] : LD50 = 8400 ㎎/㎏ Rat (RTECS)
- [Ethylbenzene] : LD50 3500 mg/kg Rat (ECHA)
- [4-Methylbenzenesulfonyl isocyanate] : LD50 = 2234 ㎎/㎏ Rat (NLM: ChemIDplus)
- [Hexamethylene Diisocyanate] : LD50 746 ㎎/㎏ Rat (OECD TG 401)(NIER, ECHA)

* Dermal

- Product (ATEmix) : 2000mg/kg < ATEmix <= 5000mg/kg
- [1,6-Diisocyanatohexane homopolymer] : LD50 > 2000 mg/kg Rat (ECHA)
- [Xylene] : LD50 12126 mg/kg Rabbit (ECHA)
- [Propylene glycol methyl ether acetate] : LD50 > 5000 mg/kg Rabbit (IUCLID)
- [n-Butyl acetate] : LD50 > 14112 mg/kg Rabbit (> 16 mL/kg) (OECD TG 402) (ECHA)
- [Solvent naphtha (petroleum), light arom.] : LD50 > 2000 ㎎/㎏ Rabbit (IUCLID)
- [Ethylbenzene] : LD50 15432 mg/kg (17.8 mL/kg) Rabbit (ECHA)
- [Hexamethylene Diisocyanate] : LD50 559 mg/kg Rabbir (NIER), LD50 593 ㎎/㎏ rabbit (CERI Hazard Data 2000-50 (2001))

* Inhalation

- Product (ATEmix) : 2.0mg/L 4hr < ATEmix <= 10.0mg/L 4hr
- [1,6-Diisocyanatohexane homopolymer] : Aerosol LC50 2.61 mg/L 4h Rat (ECHA)
- [Xylene] : Vapor LC50 10~20 mg/L 4 hr (NIER)
- [Propylene glycol methyl ether acetate] : Vapor LC0 >23.3 mg/L/4h, LC0 > 1732ppm 4hr (> 2000 ppm 3hr) Rat No death Not classified (ECHA)

- [n-Butyl acetate] : Vapor LC50 > 6.6 mg/L 4 hr Rat No death Not classified (OECD TG 403, GLP) (ECHA)

- [Solvent naphtha (petroleum), light arom.] : Vapor LC50 > 5.61 mg/L 4 hr Rat (Read-across: 86290-81-5) No death (ECHA)

- [Ethylbenzene] : Vapor LC50 10~20 mg/L 4 hr (EU Harmonized Cat. 4) (ECHA)

- [4-Methylbenzenesulfonyl isocyanate] : LC50 > 2.58 ㎎/ℓ 4hr (>640 ppm/1hr) Rat (NLM: ChemIDplus)

- [Hexamethylene Diisocyanate] : LC50 0.124 mg/L (124 ㎎/㎥ 4hr) Rat (OECD TG 403, GLP)(NIER, ECHA)

○ Skin corrosion/irritation

- Causes skin irritation

○ Serious eye damage/irritation

- Causes serious eye irritation

○ Respiratory sensitization

- May cause allergy or asthma symptoms or breathing difficulties if inhaled

○ Skin sensitization

- May cause an allergic skin reaction

○ Carcinogenicity

* IARC

- [Xylene] : Group 3

- [Ethylbenzene] : Group 2B

* OSHA

- Not available

* ACGIH

- [Xylene] : A4

- [Ethylbenzene] : A3

* NTP

- Not available

* EU CLP

- [Solvent naphtha (petroleum), light arom.] : Carc. 1B (Note P)

○ Germ cell mutagenicity

- May cause genetic defects

○ Reproductive toxicity

- Suspected of damaging fertility or the unborn child

○ STOT-single exposure

- May cause drowsiness and dizziness.

- May cause respiratory irritation.

○ STOT-repeated exposure

- May cause damage to organs through prolonged or repeated exposure

○ Aspiration hazard

- May be fatal if swallowed and enters airways

12. ECOLOGICAL INFORMATION

A. Ecotoxicity

○ Fish

- [Xylene] : LC50 7.6 mg/L 96 hr Oncorhynchus mykiss (OECD TG 203) (ECHA)

- [Propylene glycol methyl ether acetate] : LC50 100~180 mg/L 96 hr Oncorhynchus mykiss (OECD TG 203), NOEC 47.5 mg/L 14 d Oryzias latipes (OECD TG 204, GLP) (ECHA)

- [n-Butyl acetate] : LC50 18 mg/L 96 hr Pimephales promelas (OECD TG 203) (ECHA)

- [Solvent naphtha (petroleum), light arom.] : LC50 = 9.22 ㎎/ℓ 96 hr Oncorhynchus mykiss (IUCLID)

- [Ethylbenzene] : LC50 5.1 mg/L 96 hr Menidia menidia (ECHA)

- [Hexamethylene Diisocyanate] : LC0 Danio rerio ≥82.8 mg/L 96h (EU Method C.1)(ECHA)

○ Crustaceans

- [Xylene] : NOEC 1.17 mg/L 7 d Ceriodaphnia dubia (ECHA)
- [Propylene glycol methyl ether acetate] : EC50 408 mg/L 48 hr Daphnia magna (OECD TG 202, GLP), NOEC >= 100 mg/L 21 d Daphnia magna (OECD TG 211, GLP) (ECHA)
- [n-Butyl acetate] : EC50 44 mg/L 48 hr Daphnia sp. (OECD TG 202), NOEC 23.2 mg/L 21 d Daphnia magna (OECD TG 211, GLP, Read-across CAS No. 110-19-0) (ECHA)
- [Solvent naphtha (petroleum), light arom.] : EC50 = 6.14 ㎎/ℓ 48 hr Daphnia magna (IUCLID)
- [Ethylbenzene] : EC50 1.8~2.4 mg/L 48 hr Daphnia magna, NOEC 0.96 mg/L 7 d Ceriodaphnia dubia (ECHA)
- [Hexamethylene Diisocyanate] : EC50 >= 89.1 ㎎/ℓ 48 hr (NITE)

○ Algae

- [1,6-Diisocyanatohexane homopolymer] : EC50 > 1000 mg/L 72h Scenedesmus subspicatus CHODAT (ECHA)
- [Xylene] : EC50 4.7 mg/L 72 hr Raphidocelis subcapitata (OECD TG 201) (ECHA)
- [Propylene glycol methyl ether acetate] : EC50 >1000 mg/L 72 hr, NOEC >= 1000 mg/L 96 hr Raphidocelis subcapitata (OECD TG 201) (ECHA)
- [n-Butyl acetate] : EC50 392 mg/L 48 hr, NOEC 196 mg/L 48 hr Raphidocelis subcapitata (OECD TG 201, GLP) (Read-across CAS No. 110-19-0) (ECHA)
- [Solvent naphtha (petroleum), light arom.] : EC50 = 19 ㎎/ℓ 72 hr Selenastrum capricornutum (IUCLID)
- [Ethylbenzene] : EC50 3.6 mg/L 96 hr, NOEC 3.4 mg/L 96 hr Raphidocelis subcapitata (ECHA)
- [Hexamethylene Diisocyanate] : EC50 >77.4 ㎎/ℓ 72 hr (EU Method C.3)(ECHA)

B. Persistence and degradability

○ Persistence

- [1,6-Diisocyanatohexane homopolymer] : Log Kow 9.81 (ECHA)
- [Xylene] : log Pow 3.12 (ECHA)
- [Propylene glycol methyl ether acetate] : log Pow 1.2 (20 °C) (OECD TG 117, GLP) (ECHA)
- [n-Butyl acetate] : log Pow 2.3 (25°C) (OECD TG 117, GLP) (ECHA)
- [Solvent naphtha (petroleum), light arom.] : log Kow = 2.1 ~ 6 (Estimate) (IUCLID)
- [Ethylbenzene] : log Pow 3.6 (20 °C) (ECHA)
- [Hexamethylene Diisocyanate] : log Kow 1.07 (ICSC)

○ Degradability

- [Solvent naphtha (petroleum), light arom.] : BOD5/COD = 0.43

C. Bioaccumulative potential

○ Bioaccumulative potential

- [Ethylbenzene] : BCF 1 (ECHA)

○ Biodegradation

- [1,6-Diisocyanatohexane homopolymer] : 1%, 28d (O2 consumption) No biodegradation observed (ECHA)
- [Xylene] : 94 % 28 d, Readily biodegradable (OECD TG 301 F, GLP) (ECHA)
- [Propylene glycol methyl ether acetate] : 83 % 28 d, Readily biodegradable (OECD TG 301 F, GLP) (ECHA)
- [n-Butyl acetate] : 83 % 28 d, Readily biodegradable (OECD TG 301 D) (ECHA)
- [Ethylbenzene] : 70~ 80 % 28 d, Readily biodegradable (ECHA)
- [Hexamethylene Diisocyanate] : 42% 28 day (Nonbiodegradable, OECD TG301F)(ECHA)

D. Mobility in soil

- [Xylene] : log Koc ca. 2.73 dimensionless (OECD TG 121) (ECHA)

E. Other adverse effects

- Not available

13. DISPOSAL CONSIDERATIONS

A. Disposal methods

- It shall be treated by incineration

- Oil water separation technology shall be applied as pre-waste treatment if it is applicable

- Stabilization and minimization treatment by incineration or similar method can be applied, if more than two kinds of designated wastes are in mixture state and it is impractical to separate them

- High temperature incinerate

- After taking off organic solvents that are supposed to be recycled, incinerate the rest of them at a high degree.

B. Special precautions for disposal

- Anyone with business license number who generates industrial wastes shall treat the waste by him/herself or by entrusting to the legal entities who treat the wastes, recycle the wastes of others or install and operate the waste treatment facilities according to the Wastes Control Act

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

14. TRANSPORT INFORMATION

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

- 1992

B. Proper shipping name

- PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)

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

- [1,6-Diisocyanatohexane homopolymer] : Not applicable
- [Xylene] : Not applicable
- [Propylene glycol methyl ether acetate] : Not applicable
- [n-Butyl acetate] : Not applicable
- [Solvent naphtha (petroleum), light arom.] : Not applicable
- [Ethylbenzene] : Not applicable
- [4-Methylbenzenesulfonyl isocyanate] : Not applicable
- [Hexamethylene Diisocyanate] : Not applicable

○ Information of EU Classification

* Classification

- [Xylene] : H226,H312,H315,H332
- [Propylene glycol methyl ether acetate] : H226
- [n-Butyl acetate] : H226,H336
- [Solvent naphtha (petroleum), light arom.] : H304,H340,H350
- [Ethylbenzene] : H225,H304,H332,H373
- [4-Methylbenzenesulfonyl isocyanate] : H315,H319,H334,H335
- [Hexamethylene Diisocyanate] : H315,H317,H319,H331,H334,H335

○ U.S. Federal regulations

* OSHA PROCESS SAFETY (29CFR1910.119)

- Not applicable

* CERCLA Section 103 (40CFR302.4)

- [Xylene] : 45.3599 kg 100 lb
- [n-Butyl acetate] : 2267.995 kg 5000 lb
- [Ethylbenzene] : 453.599 kg 1000 lb
- [Hexamethylene Diisocyanate] : 45.3599 kg 100 lb
- [1,6-Diisocyanatohexane homopolymer] : Not applicable
- [Propylene glycol methyl ether acetate] : Not applicable
- [Solvent naphtha (petroleum), light arom.] : Not applicable
- [4-Methylbenzenesulfonyl isocyanate] : Not applicable

* EPCRA Section 302 (40CFR355.30)

- Not applicable

* EPCRA Section 304 (40CFR355.40)

- Not applicable

* EPCRA Section 313 (40CFR372.65)

- [Xylene] : Applicable
- [Ethylbenzene] : Applicable
- [Hexamethylene Diisocyanate] : Applicable
- [1,6-Diisocyanatohexane homopolymer] : Not applicable
- [Propylene glycol methyl ether acetate] : Not applicable
- [n-Butyl acetate] : Not applicable
- [Solvent naphtha (petroleum), light arom.] : Not applicable
- [4-Methylbenzenesulfonyl isocyanate] : 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

- 2016-12-12

C. Revision number and Last date revised

- 8 times, 2024-02-23

D. Other

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

SAFETY DATA SHEET

According to OSHA Hazcom Standard 29 CFR 1910.1200

037U(FOR WINTER)

1. IDENTIFICATION

A. Product name

- 037U(FOR WINTER)

B. Recommended use and restriction on use

- General use : thinner
- Restriction on use : Do not use except for purpose

C. Manufacturer / Supplier / Distributor information

○ **Manufacturer information**

- Company name : KCC Corporation
- Address : 30, Bangeojinsunhwando-ro, Dong-gu, Ulsan
- Emergency telephone number : 82-52-280-1717

○ **Supplier/Distributer information**

- Company name : KCC Corporation
- Address : 30, Bangeojinsunhwando-ro, Dong-gu, Ulsan
- Emergency telephone number : 82-52-280-1717

2. HAZARD IDENTIFICATION

A. GHS Classification

- Flammable liquids : Category2
- Acute toxicity (oral) : Category5
- Acute toxicity (inhalation: vapor) : Category5
- Skin corrosion/irritation : Category2
- Serious eye damage/irritation : Category2
- Carcinogenicity : Category2
- Reproductive toxicity : Category2
- Specific target organ toxicity(Single exposure) : Category3(Narcotic effects)
- Specific target organ toxicity(Single exposure) : Category3(Respiratory tract irritation)
- Specific target organ toxicity(Repeated exposure) : Category2
- Aspiration hazard : Category1
- Acute aquatic toxicity : Category2
- Chronic aquatic toxicity : Category3

B. GHS label elements

○ **Hazard symbols**



○ **Signal words**

- Danger

○ **Hazard statements**

- H225 Highly flammable liquid and vapour
- H303 May harmful if swallowed.
- H304 May be fatal if swallowed and enters airways
- H315 Causes skin irritation

- H319 Causes serious eye irritation
- H333 May be harmful if inhaled.
- H335 May cause respiratory irritation.
- H336 May cause drowsiness and dizziness.
- H351 Suspected of causing cancer
- H361 Suspected of damaging fertility or the unborn child
- H373 May cause damage to organs through prolonged or repeated exposure (Refer Section SDS 11)
- H401 Toxic to aquatic organisms.
- H412 Harmful to aquatic life with long lasting effects

○ **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, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P233 Keep container tightly closed.
- P240 Ground and bond container and receiving equipment.
- P241 Use explosion-proof electrical/ventilating/lighting/equipment.
- P242 Use non-sparking tools.
- P243 Take action to prevent static discharges.
- P260 Do not breathe dust/fume/gas/mist/vapours/spray.
- P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
- P264 Wash hands thoroughly after handling.
- P271 Use only outdoors or in a well-ventilated area.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

2) Response

- P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- 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.
- P304+P312 IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.
- 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 or concerned: Get medical advice/attention.
- P312 Call a POISON CENTER or doctor/physician if you feel unwell.
- P314 Get medical advice/attention if you feel unwell.
- P321 Specific treatment
- P331 Do NOT induce vomiting.
- P332+P313 If skin irritation occurs: Get medical advice/attention.
- P337+P313 If eye irritation persists: Get medical advice/attention.
- P362+P364 Take off contaminated clothing and wash before reuse.
- P370+P378 In case of fire: Use Suitable extinguishing media for extinction(Refer Section MSDS 5).

3) Storage

- P403+P233 Store in a well-ventilated place. Keep container tightly closed.
- 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

- Not available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
Toluene	Methylbenzene ; Methylbenzol ; Phenyl methane ; Methacide ; Toluol ; 1-Methylbenzene	108-88-3	46 ~ 53

Acetic acid ethyl ester	Acetic ether ; Acetidin ; Acetoxyethane ; Ethyl acetic ester ; Ethyl ester ; Ethyl ethanoate ; Vinegar naphtha ; Acetoxy ethane ;	141-78-6	16 ~ 23
4-Methyl-2-pentanone	2-Methyl-4-pentanone ; 2-Methylpropyl methyl ketone ; Hexanone ; 4-Methyl-2-pentanone ; Isobutyl methyl ketone ; Hexone ; 4-Methylpentan-2-one ; Isopropylacetone ;	108-10-1	10 ~ 17
n-Butyl acetate	Acetic acid, butyl ester ; 1-Butyl acetate ; Butyl acetate ; Acetic acid N-butyl ester ; Butyl ethanoate ; 1-Acetoxybutane	123-86-4	7 ~ 14
Xylene	Xylol ; Methyltoluene	1330-20-7	4 ~ 11
Ethylbenzene	Benzene, ethyl- ; Ethyl benzene ; Ethylbenzol ; Phenylethane ;	100-41-4	1 ~ 6

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.
- 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.
- Wash contaminated clothing thoroughly before re-using.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- Wash thoroughly after handling.

C. Inhalation contact

- Take specific treatment if needed.
- When exposed to large amounts of steam and mist, move to fresh air.
- 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.
- If swallowed, large amounts of water to drink and do not induce vomiting.

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

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

B. Specific hazards arising from the chemical

- Causes serious eye irritation
- Causes skin irritation
- Harmful to aquatic life with long lasting effects
- Highly flammable liquid and vapour
- May be fatal if swallowed and enters airways

C. Special protective actions for firefighters

- Avoid inhalation of materials or combustion by-products.
- Cool containers with water until well after fire is out.
- Do not approach the tank surrounded by fire until it is extinguished.
- In case of conflagration, use automatic fire sprinkler. Major fire may require withdrawal, allowing the object itself to burn.
- Keep unauthorized personnel out.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures

- Do not touch spilled material. Stop leak if you can do it without risk.
- Handle the damaged containers or spilled material after wearing appropriate protective equipment
- Move container to safe area from the leak area.
- Must work against the wind, let the upwind people to evacuate.
- Remove all sources of ignition.

B. Environmental precautions

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

C. Methods and materials for containment and cleaning up

- Appropriate container for disposal of spilled material collected.
- Dike for later disposal.
- Disposal of waste shall be in compliance with the Wastes Control Act
- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notify the central and local government if the emission reach the standard threshold.

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Avoid contact with incompatible materials.
- Avoid direct physical contact.
- Comply with all applicable laws and regulations for handling
- Dealing only with a well-ventilated place.
- Do not handle until all safety precautions have been read and understood.

B. Conditions for safe storage, including any incompatibilities

- Avoid direct sunlight.
- Check regularly for leaks.
- Do not apply any physical shock to container.
- Do not apply direct heat.
- Do not use damaged containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits

○ **ACGIH TLV**

- [Toluene] : TWA 20 ppm (75 mg/m3)
- [Acetic acid ethyl ester] : TWA, 400 ppm (1440 mg/m3)
- [4-Methyl-2-pentanone] : TWA, 20 ppm (82 mg/m3) STEL 75 ppm (307 mg/m3)
- [n-Butyl acetate] : TWA 50 ppm , STEL 150 ppm
- [Xylene] : TWA 20 ppm
- [Ethylbenzene] : TWA, 20 ppm (87 mg/m3)

○ **OSHA PEL**

- [Toluene] : 200 ppm, (C) 300 ppm
- [Acetic acid ethyl ester] : 400 ppm, 1400 mg/m3
- [4-Methyl-2-pentanone] : 100 ppm, 410 mg/m3
- [n-Butyl acetate] : 150 ppm, 710 mg/m3
- [Xylene] : 100 ppm, 435 mg/m3
- [Ethylbenzene] : 100 ppm, 435 mg/m3

B. Engineering controls

- Business owner is recommended to maintain below recommended exposure limits for the working place with general exhaust of gas/vapour/mist/fume.

C. Individual protection measures, such as personal protective equipment

○ **Respiratory protection**

- Any air-purifying respirator with a full facepiece and an organic vapor canister.
- Any chemical cartridge respirator with a full facepiece and organic vaporcartridge(s).
- Any chemical cartridge respirator with organic vapor cartridge(s).
- Consider warning properties before use.
- 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.
- Respiratory protection is ranked in order from minimum to maximum.
- Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.

○ **Eye protection**

- Provide an emergency eye wash station and quick drench shower in the immediate work area.
- Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.

○ **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
- Color	CLAER
B. Odor	Solvent odor
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	Not available
F. Initial Boiling Point/Boiling Ranges	105.5℃
G. Flash point	6.5℃
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	Not available
M. Vapour density	>1
N. Specific gravity(Relative density)	0.82~0.92
O. Partition coefficient of n-octanol/water	No data
P. Autoignition temperature	360℃
Q. Decomposition temperature	Not available
R. Viscosity	Not available
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

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

C. Conditions to avoid

- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces

- Avoid contact with incompatible materials and condition.
- 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**

- May be fatal if swallowed and enters airways
- May cause respiratory irritation.

○ **Oral**

- May harmful if swallowed.

○ **Eye·Skin**

- Causes skin irritation

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
- [Toluene] : LD50 5580 mg/kg Rat (EU Method B.1) (ECHA)
- [Acetic acid ethyl ester] : LD50 5620 ㎎/㎏ Rat (IUCLID), LD50 11.3 mL/kg Rat(female)(ECHA)
- [4-Methyl-2-pentanone] : LD50 2080 ㎎/㎏ Rat (NITE, ECHA)
- [n-Butyl acetate] : LD50 12789 mg/kg Rat (calculated, 12.2 ㎖/㎏, based on specific gravity of 0.882) (ECHA)
- [Xylene] : LD50=3523 mg/kg Rat (EU Method B1) (ECHA)
- [Ethylbenzene] : LD50 3500 mg/kg Rat (ECHA)

*** Dermal**

- Product (ATEmix) : >5000mg/kg
- [Toluene] : LD50 > 5000 mg/kg Rabbit (ECHA)
- [Acetic acid ethyl ester] : LD50 > 18000 ㎎/㎏ Rabbit (IUCLID)
- [4-Methyl-2-pentanone] : LD50 >16,000 ㎎/㎏ rabbit (NITE)
- [n-Butyl acetate] : LD50 > 14112 mg/kg Rabbit (calculated, 16 ㎖/㎏, based on specific gravity of 0.882) (ECHA)
- [Xylene] : LD50 ≥1,700mg/kg Rabbit (NIER)
- [Ethylbenzene] : LD50 15432 mg/kg (17.8 mL/kg) Rabbit (ECHA)

*** Inhalation**

- Product (ATEmix) : 20.0mg/L < ATEmix <= 50.0mg/L, Vapour, 4hr
- [Toluene] : Vapor LC50 28.1 mg/L 4 hr Rat (OECD TG 403) (ECHA)
- [Acetic acid ethyl ester] : Steam LC50 100 ㎎/ℓ 4 hr Rat (LC50 = 200 mg/L/1hr)(IUCLID)
- [4-Methyl-2-pentanone] : vapor LC50 11.6 ㎎/ℓ 4h Rat (ECHA)
- [n-Butyl acetate] : Vapour LC50 >21 mg/L 4hr Rat No death Not classified (OECD Guideline 403, GLP)(ECHA)
- [Xylene] : Vapor LC50 = 10 ~ 20 mg/L/4hr (NIER)
- [Ethylbenzene] : Vapor LC50 10~20 mg/L 4 hr (EU Harmonized Cat. 4) (ECHA)

○ **Skin corrosion/irritation**

- Causes skin irritation

○ **Serious eye damage/irritation**

- Causes serious eye irritation

○ **Respiratory sensitization**

- Not available

○ **Skin sensitization**

- Not available

○ **Carcinogenicity**

*** IARC**

- [Toluene] : Group 3
- [4-Methyl-2-pentanone] : Group 2B

- [Xylene] : Group 3
- [Ethylbenzene] : Group 2B

*** OSHA**

- Not available

*** ACGIH**

- [Toluene] : A4
- [4-Methyl-2-pentanone] : A3
- [Xylene] : A4
- [Ethylbenzene] : A3

*** NTP**

- Not available

*** EU CLP**

- Not available

○ **Germ cell mutagenicity**

- Not available

○ **Reproductive toxicity**

- Suspected of damaging fertility or the unborn child

○ **STOT-single exposure**

- May cause drowsiness and dizziness.
- May cause respiratory irritation.

○ **STOT-repeated exposure**

- May cause damage to organs through prolonged or repeated exposure (Refer Section SDS 11)

○ **Aspiration hazard**

- May be fatal if swallowed and enters airways

12. ECOLOGICAL INFORMATION

A. Ecotoxicity

○ **Fish**

- [Toluene] : LC50 5.5 mg/L 96 hr, NOEC 1.39 mg/L 40 d Oncorhynchus kistutch (ECHA)
- [Acetic acid ethyl ester] : LC50 230 ㎎/ℓ 96 hr Pimephales promelas (ECHA)
- [4-Methyl-2-pentanone] : LD50 >179 ㎎/ℓ 96 hr Brachydanio rerio (OECD Guideline 203, GLP) (ECHA)
- [n-Butyl acetate] : LC50 18 ㎎/ℓ 96 hr Pimephales promelas (OECD TG 203)(ECHA)
- [Xylene] : LC50=3.3mg/L 96 hr (NITE)
- [Ethylbenzene] : LC50 5.1 mg/L 96 hr Menidia menidia (ECHA)

○ **Crustaceans**

- [Toluene] : EC50 3.78mg/L 48hr, NOEC 0.74 mg/L 7 d Ceriodaphnia dubia (ECHA)
- [Acetic acid ethyl ester] : EC50 2500 ㎎/ℓ 24 hr Daphnia magna(other guideline: DIN 38412 pt 11) (ECHA)
- [4-Methyl-2-pentanone] : EC50 >200 ㎎/ℓ 48 hr Daphnia magna (OECD TG 202, GLP) (ECHA)
- [n-Butyl acetate] : EC50 44 ㎎/ℓ 48 hr Daphnia magna (ECHA)
- [Xylene] : LC50 3.6 ㎎/ℓ 24 hr (OECD TG202) (ECHA)
- [Ethylbenzene] : EC50 1.8~2.4 mg/L 48 hr Daphnia magna, NOEC 0.96 mg/L 7 d Ceriodaphnia dubia (ECHA)

○ **Algae**

- [Toluene] : EC50 134 mg/L 3 hr Chlorella vulgaris and Chlamydomonas angulosa (ECHA)
- [Acetic acid ethyl ester] : EC50 1800 ~ 3200 ㎎/ℓ 72 hr (Selenastrum sp.) (ECOTOX)
- [4-Methyl-2-pentanone] : EC50 >146 ㎎/ℓ 7day Other(Blue algae, OECD221) (ECHA)
- [n-Butyl acetate] : EC50 397mg/L 72hr, NOEC 105 mg/L 72hr Raphidocelis subcapitata (Read-across CAS No 110-19-0) (ECHA)
- [Xylene] : ErC50 4.06 ㎎/ℓ 73 hr (OECD TG201, GLP) (ECHA)
- [Ethylbenzene] : EC50 3.6 mg/L 96 hr, NOEC 3.4 mg/L 96 hr Raphidocelis subcapitata (ECHA)

B. Persistence and degradability

○ **Persistence**

- [Toluene] : log Pow 2.73 (20 °C) (ECHA)
- [Acetic acid ethyl ester] : log Kow 0.73 (ICSC), 0.68 log Kow (25°C, pH 7, EPA OPPTS 830.7560)
- [4-Methyl-2-pentanone] : log Kow 1.9 (OECD TG 117) (ECHA)
- [n-Butyl acetate] : log Kow 2.3 (25°C, OECD TG 117) log Kow 1.78 (HSDB)
- [Xylene] : log Kow=3.16 (NITE)
- [Ethylbenzene] : log Pow 3.6 (20 °C) (ECHA)

○ **Degradability**

- [Acetic acid ethyl ester] : BOD5/COD 0.81 (IUCLID)

C. Bioaccumulative potential

○ **Bioaccumulative potential**

- [Toluene] : BCF 90 (ECHA)
- [Acetic acid ethyl ester] : BCF 30 (IUCLID)
- [Xylene] : BCF25.9 (ECHA)
- [Ethylbenzene] : BCF 1 (ECHA)

○ **Biodegradation**

- [Toluene] : 69 % 5 d, Readily biodegradable (ECHA)
- [Acetic acid ethyl ester] : 100 (%) 28 day (IUCLID)
- [4-Methyl-2-pentanone] : 83% 28 day (O2 consumption) Readily biodegradable (OECD TG 301, GLP) (ECHA)
- [n-Butyl acetate] : 83% 28 day Readily biodegradable (OECD TG 301D) (ECHA)
- [Xylene] : 90 % 28 day (OECD TG301F, GLP)(ECHA)
- [Ethylbenzene] : 70~ 80 % 28 d, Readily biodegradable (ECHA)

D. Mobility in soil

- [4-Methyl-2-pentanone] : Koc 101.85 (Estimate) (ECHA)
- [Xylene] : log Kow = 3.12 (measured) (ortho), 3.2 (measured) (meta), 3.15 (measurements) (p) (5)

E. Other adverse effects

- [Acetic acid ethyl ester] : Fish 32d-NOEC Pimephales promelas< 9.65 mg/L OECD TG 210 Crustacean: 21d-NOEC Daphnia magna=2.4 mg/L OECD TG 211 Algae: 72h-NOEC Scenedesmus subspicatus> 100 mg/L growth rate OECD TG 201, GLP (ECHA)
- [4-Methyl-2-pentanone] : crustaceans(Daphnia magna) : NOEC(21d) 78mg/L (OECD TG 211) (ECHA)
- [Xylene] : Fish NOEC 56d>1.3mg/L Daphnia magna (US EPA 600/4-91-003) NOEC=1.17 mg/L(ECHA)

13. DISPOSAL CONSIDERATIONS

A. Disposal methods

- It shall be treated by incineration
- Oil water separation technology shall be applied as pre-waste treatment if it is applicable
- Stabilization and minimization treatment by incineration or similar method can be applied, if more than two kinds of designated wastes are in mixture state and it is impractical to separate them
- Will be pre-processed by the separation of oil and water.

B. Special precautions for disposal

- Anyone with business license number who generates industrial wastes shall treat the waste by him/herself or by entrusting to the legal entities who treat the wastes, recycle the wastes of others or install and operate the waste treatment facilities according to the Wastes Control Act
- Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

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

- 1263

B. Proper shipping name

- PAINT RELATED MATERIAL (including paint thinning or reducing compound)

C. Hazard Class

- 3

D. IMDG CODE/IATA DGR Packing group

- II

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**

- [Toluene] : Not applicable
- [Acetic acid ethyl ester] : Not applicable
- [4-Methyl-2-pentanone] : Not applicable
- [n-Butyl acetate] : Not applicable
- [Xylene] : Not applicable
- [Ethylbenzene] : Not applicable

○ **Information of EU Classification**

*** Classification**

- [Toluene] : H225,H304,H315,H336,H361,H373
- [Acetic acid ethyl ester] : H225,H319,H336
- [4-Methyl-2-pentanone] : H225,H319,H332,H335,H351
- [n-Butyl acetate] : H226,H336
- [Xylene] : H226,H312,H315,H332
- [Ethylbenzene] : H225,H304,H332,H373

○ **U.S. Federal regulations**

*** OSHA PROCESS SAFETY (29CFR1910.119)**

- Not applicable

*** CERCLA Section 103 (40CFR302.4)**

- [Toluene] : 453.599 kg 1000 lb
- [Acetic acid ethyl ester] : 2267.995 kg 5000 lb
- [4-Methyl-2-pentanone] : 2267.995 kg 5000 lb
- [n-Butyl acetate] : 2267.995 kg 5000 lb
- [Xylene] : 45.3599 kg 100 lb
- [Ethylbenzene] : 453.599 kg 1000 lb

*** EPCRA Section 302 (40CFR355.30)**

- Not applicable

*** EPCRA Section 304 (40CFR355.40)**

- Not applicable

*** EPCRA Section 313 (40CFR372.65)**

- [Toluene] : Applicable
- [4-Methyl-2-pentanone] : Applicable
- [Xylene] : Applicable
- [Ethylbenzene] : Applicable
- [Acetic acid ethyl ester] : Not applicable
- [n-Butyl acetate] : 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

- 2013-10-02

C. Revision number and Last date revised

- 15 times, 2023-03-14

D. Other

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

물질안전보건자료
(Material Safety Data Sheet)

YUSOL®-E 120H

대외비 문서　對外秘文書　Confidential Document

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SECTION 1: Identification

1.1. Product identifier	**YUSOL-E120H**
1.2. Recommended use and restrictions on use	
Recommended use	For High Precision Degreasing and Cleaning (For Industrial Use Only.)
Restrictions on use	Not Intended For Use As A Medical Device Or Drug.
1.3. Supplier's details	
MANUFACTURER	YOUNG DO OIL-CHEM CO., Ltd.
ADDRESS	#71, Bong am gong dan 1 gil, Hoe won gu, Chang won si, Gyeoung nam, Korea
Telephone:	+82-(0)55-297-0111
	+82-(0)10-3632-4588 (In Emergency, 24hrs)

SECTION 2: Hazard identification

2.1. Hazard classification	Flammable liquid : Group 2
	Eye irritation : Group 2
	Chronic aquatic toxicant : Group 4
2.2. Label elements	
Pictograms	



Signal word	**Danger**
Hazard statements	**H225** Highly flammable liquid and vapour
	H319 May cause an allergic skin reaction.
	H413 May cause long lasting harmful effects to aquatic life.
Precautionary statements	**P201** Obtain special instructions before use.
	P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
	P233 Keep container tightly closed.
	P240 Ground/bond container and receiving equipment
	P243 Take precautionary measures against static discharge.
	P264 Wash … thoroughly after handling
	P273 Avoid release to the environment
	P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
	P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
	P370+P378 In case of fire: Use … for extinction
	P501 Dispose of contents/container to …
2.3. NFPA RATINGS (SCALE 0-4)	

Health	0
Fire	3
Reactivity	0

SECTION 3: Composition/information on ingredients

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Ingredient	CAS No.	% by Wt
Synthetic, C8-10 ISOALKANES	68551-15-5	55~65
Synthetic, C9-11 ISOALKANES	68551-16-6	30~40
Anti-static additive (Trade secret)		1~10

This product doesn't contain any reportable hazardous substance

SECTION 4: First aid measures

4.1 Eye Contact	Flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing.
	If signs/symptoms persist, get medical attention.
4.2 Skin Contact	Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes.
	Get medical attention, if needed.
	Thoroughly clean and dry contaminated clothing and shoes before reuse.
4.3 Inhalation	If adverse effects occur, remove to uncontaminated area.
	Give artificial respiration if not breathing.
	Get immediate medical attention.
4.4 If Swallowed	Rinse mouth. Do not induce vomiting.
	If a large amount is swallowed, get medical attention.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media	Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.
5.2. Fire and Explosion Hazards	Highly flammable.
	Vapors are flammable and heavier than air.
	Vapors may travel across the ground and reach remote ignition sources causing a flashback fire danger.
5.3. Special protective actions for fire-fighters	Evacuate area.
	If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop a leak.
	Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.
	Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA).
	Use water spray to cool fire exposed surfaces and to protect personnel.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures	Avoid heat, flames, sparks and other sources of ignition.
	Remove sources of ignition.
	Avoid contact with spilled material.
	Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material.

6.2. Spill management	**Land Spill**: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapor; but may not prevent ignition in closed spaces.
	Water Spill: Stop leak if you can do it without risk. Eliminate sources of ignition. Warn other shipping. If the Flash Point exceeds the Ambient Temperature by 10 degrees C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Temperature by 10 degrees C or is less than the Ambient Temperature, use booms as a barrier to protect shorelines and allow the material to evaporate. Seek the advice of a specialist before using dispersants.
	Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.
6.3. Environmental considerations	Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7: Handling and storage

7.1. Precautions for safe handling	Use non-sparking tools and explosion-proof equipment.
	Use proper bonding and/or grounding procedures.
	Prevent small spills and leakage to avoid slip hazard.
	For industrial or professional use only.
	Avoid release to the environment.
7.2. Conditions for safe storage including any incompatibilities	Keep container tightly closed.
	Ample fire water supply should be available.
	A fixed sprinkler/deluge system is recommended.
	Keep container closed.
	Handle containers with care.
	Open slowly in order to control possible pressure release
	Store in a cool, well-ventilated area.
	Storage containers should be grounded and bonded.
	Drums must be grounded and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters.
	Storage Temperature: [Ambient]
	Storage Pressure: [Ambient]
	Suitable Containers/Packing: Tank Cars; Tank Trucks; Drums; Tank Vessel
	Suitable Materials and Coatings: Carbon Steel; Stainless Steel; Polyethylene; Polypropylene; Polyester; Teflon
	Unsuitable Materials and Coatings: Natural Rubber; Butyl Rubber; Ethylene-proplyene-diene monomer (EPDM); Polystyrene

SECTION 8: Exposure controls/personal protection

8.1. Occupational exposure limits	
Domestic Regulation (Korea)	N/A
ACGIH	N/A
Biological Exposure Limit	N/A
8.2. Exposure controls	N/A

8.3. Personal protective equipment	N/A

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical State	Liquid
Color	Colorless
Odor	Faint odor
pH	Not availlable
Freezing Point	-63℃
Boiling Point	115℃ - 140℃
Flash Point	7 ℃
Evaporation Rate	2.08 (Ether=1)
Flammable Limits	0.9 - 6.2 vol %
Vapor Pressure	2.37 kPa at 20℃
Water Solubility	Insoluble
Vapor Density	4.1 at 101kPa
Density	0.9 ~ 0.95
Partition coefficient: n-octanol/ water	No Data Available
Autoignition temperature	395℃
Decomposition temperature	No Data Available
Viscosity	0.85cSt (1.8 mm2/sec) at25℃/0.72 cSt(1.39 mm2/sec) at 40℃
Molecular Weight	No Data Available

SECTION 10: Stability and reactivity

10.1. Chemical stability	Material is stable under normal conditions.
10.3. Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources.
10.4. Incompatible materials	Strong oxidizers
10.5. Hazardous decomposition products	Material does not decompose at ambient temperatures

SECTION 11: Toxicological information

11.1. Acute Toxicity	
Oral	LD50 > 34600 mg/kg Rat
Dermal	N/A
Inhalation	N/A
11.2. Skin Corrosion/Irritation	N/A
11.3. Serious Eye Damage/Irritation	May cause mild, short-lasting discomfort to eyes. Based on test data for the material.
11.4 Respiratory Sensitization	N/A
11.5 Skin Sensitization	N/A
11.6. Carcinogenicity	
IARC	N/A
OSHA	N/A
ACGIH	N/A
NTP	N/A
EU CLP	N/A
11.7 Reproductive Toxicity	N/A
11.8. Specific Target Organ Toxicity- single exposure	N/A
11.9 Specific Target Organ Toxicity-repeated exposure	N/A
11.10 Aspiration Hazard	N/A

SECTION 12: Ecological information

12.1. Ecotoxicological information	
Fish	N/A
Shellfish	N/A
Bird	N/A

SECTION 13: Disposal considerations

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

SECTION 14: Transport Information

14.1 UN No.	1268
14.2 Proper Shipping Name	PETROLEUM DISTILLATES, N.O.S
14.3. Hazard Class or Division	III
14.4. Packing Group	I

SECTION 15: Regulatory information

15.1 Domestic (Korea)	
Occupation Safety and Health Acts	N/A
The Law of Harmful Chemical Material Control	N/A
Safety Control of Dangerous Substances	Classified [The 4th The Third Petrolium Category]
Waste Management Act	N/A
15.2 International	
OSHA (USA)	N/A
CERCLA (USA)	N/A
EPCRA 302 (USA)	N/A
EPCRA 304 (USA)	N/A
EPCRA 313 (USA)	N/A
Rotterdam Convention	N/A
Stockholm Convention	N/A
Montreal Protocol	N/A
EU Classification	N/A

SECTION 16: Other information

16.1 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

ECOSAR

ECOSAR Class: Neutral Organics

EPISUITE

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16.2. Date of Preparation	FEB/25/2015
16.3 The Last Revision Date	DEC/16/2018

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International Paint (Korea) Limited

Safety Data Sheet

QPA975 INTERTHANE 976 POLYURETHANE VARNISH PTA

Version No 14 **Revision Date** 04/06/20

1. Product and company identification

1.1. Product identifier INTERTHANE 976 POLYURETHANE VARNISH PTA

Product Code QPA975

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use Cosmetic finish coat
For professional use only.

Application Method Refer Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet
Importer or
Manufacturer

International Paint (Korea) Limited
(8-6B/L Chilseo Industrial Complex),
626-6 Gyenae-Ri,
Chilseo-Myeon, Haman-Gun,
Gyeongsangnam-Do
Korea

Telephone No. 055-632-6286(R&D), 055 586 2310(Fact
Fax No. 055 632-6287(R&D), 055 587 6276(Fact
1.4. Emergency telephone number (24 hour) 055-586-2310(Factory)
For Poisons Advice telephone 055-586-2310(Factory) For Advice to Doctors & Hospitals only

2. Hazard identification of the product

2.1. Classification of the substance or mixture

Flam. Liq. 3;H226	Flammable liquid and vapour.
Skin Irrit. 2;H315	Causes skin irritation.
Eye Irrit. 2;H319	Causes serious eye irritation.
STOT SE 3;H335	May cause respiratory irritation. Specific Target Organs: (narcotic effects)

2.2. Label elements

Using the Toxicity Data listed in section 11 & 12 the product is labelled as follows.



Warning

H226 Flammable liquid and vapour.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H335 May cause respiratory irritation.

[Prevention]:

P210 Keep away from heat / sparks / open flames / hot surfaces - No smoking.

P235 Keep cool.

P240 Ground / bond container and receiving equipment.

P241 Use explosion-proof electrical / ventilating / light / equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

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

P264 Wash thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves / eye protection / face protection.

[Response]:

P302+352 IF ON SKIN: Wash with soap and water.

P303+361+353 IF ON SKIN (or hair): Remove / Take off immediately all contaminated clothing. Rinse skin with water / shower.

P304+312 IF INHALED: Call a POISON CENTER or doctor / physician if you feel unwell.

P305+351+338 IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.

P321 Specific treatment (see information on this label).

P337+313 If eye irritation persists: Get medical advice / attention.

P304+340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P362 Take off contaminated clothing and wash before reuse.

P370+378 In case of fire: Use alcohol resistant foam, CO_2, powder, water spray for extinction. Do not use water jet.

[Storage]:

P403+233 Store in a well ventilated place. Keep container tightly closed.

P405 Store locked up.

[Disposal]:

P501 Dispose of contents / container in accordance with local / national regulations.

2.3. Other hazards

This product contains no PBT/vPvB chemicals.

3. Composition/information on ingredients

This product contains the following hazardous substances.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
1-Methoxy-2-propylacetate **CAS Number: 0000108-65-6**	**20- <30**	**Flam. Liq. 3;H226**	**[1]**
Xylene **CAS Number: 0001330-20-7**	**20- <30**	**Flam. Liq. 3;H226** **Acute Tox. 4;H312** **Acute Tox. 4;H332** **Skin Irrit. 2;H315** **Eye Dam. 2A;H319** **STOT SE 3;H336** **STOT RE 1;H372**	**[1][2]**
Ethyl acetate **CAS Number: 0000141-78-6**	**5- <10**	**Flam. Liq. 2;H225** **Eye Irrit. 2;H319** **STOT SE 3;H336**	**[1][2]**
Bis(pentamethyl-4-piperidyl)sebacate **CAS Number: 0041556-26-7**	**0.1 =< ~ < 0.2**	**Skin Sens. 1;H317** **Aquatic Chronic 1;H410**	**[1]**

[1] Substance classified with a health or environmental hazard.
[2] Substance with a workplace exposure limit.
[3] PBT-substance or vPvB-substance.

*The full texts of the Hazard (H) phrases are shown in Section 16.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence do not require reporting in this section.

Common Names

0000108-65-6 (1-Methoxy-2-propylacetate)

0001330-20-7 (Xylene)

0000141-78-6 (Ethyl acetate)

0041556-26-7 (Bis(pentamethyl-4-piperidyl)sebacate)

4. First aid measures

4.1. Description of first aid measures

General

In all cases of doubt, or when symptoms persist, seek medical attention.

Never give anything by mouth to an unconscious person.

Inhalation

Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

Skin Contact

Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognised skin cleanser. Do NOT use solvents or thinners.

Eye Contact

Irrigate copiously with clean fresh water for at least 10 minutes, holding the eyelids apart and seek medical attention.

Ingestion

If accidentally swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

No data available

4.3. Indication of any immediate medical attention and special treatment needed and notes for physician

No data available

5. Fire-fighting measures

5.1. Extinguishing media

Recommended extinguishing media; alcohol resistant foam, CO_2, powder, water spray.

Do not use - water jet.

Note; Fire will produce dense black smoke. Decomposition products may be hazardous to health. Avoid exposure and use breathing apparatus as appropriate.

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

5.2. Special hazards arising from the substance or mixture

Fire will produce dense black smoke. Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.
Avoid exposure and use breathing apparatus as appropriate.

5.3. Advice for fire-fighters

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Remove sources of ignition, do not turn lights or unprotected electrical equipment on or off. In case of a major spill or spillage in a confined space evacuate the area and check that solvent vapour levels are below the Lower Explosive Limit before re-entering.

6.2. Environmental precautions

Do not allow spills to enter drains or watercourses.

6.3. Methods and material for containment and cleaning up

Ventilate the area and avoid breathing vapours. Take the personal protective measures listed in section 8.

Contain and absorb spillage with non-combustible materials e.g. sand, earth, vermiculite. Place in closed containers outside buildings and dispose of according to the Waste Regulations. (See section 13).

Clean, preferably with a detergent. Do not use solvents.

Do not allow spills to enter drains or watercourses.

If drains, sewers, streams or lakes are contaminated, inform the local water company immediately. In the case of contamination of rivers, streams or lakes the Environmental Protection Agency should also be informed.

7. Handling and storage

7.1. Precautions for safe handling

Handling

This coating contains solvents. Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Areas of storage, preparation and application should be ventilated to prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentrations higher than the occupational exposure limits.

In Storage

Handle containers carefully to prevent damage and spillage.

Naked flames and smoking should not be permitted in storage areas. It is recommended that fork lift trucks and electrical equipment are protected to the appropriate standard.

This coating contains solvents. Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Areas of storage, preparation and application should be ventilated to prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentrations higher than the occupational exposure limits.

7.2. Conditions for safe storage, including any incompatibilities

Keep away from the following materials: oxidising agents, strong alkalis, strong acids.

Avoid skin and eye contact. Avoid inhalation of vapours and spray mists. Observe label precautions. Use personal protection as shown in section 8.

Smoking, eating and drinking should be prohibited in all preparation and application areas.

Never use pressure to empty a container; containers are not pressure vessels.

There are no exposure scenarios, see details in section 1.

7.3. Specific end use(s)

Store in a well ventilated, dry place away from sources of heat and direct sunlight.

Store on concrete or other impervious floor, preferably with bunding to contain any spillage. Do not stack more than 3 pallets high.

Keep container tightly closed. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in the original container or one of the same material.

Prevent unauthorised access.

All sources of ignition (hot surfaces, sparks, open flames etc) should be excluded from areas of preparation and application. All electrical equipment (including torches) should be protected (Ex) to the appropriate standard.

The product may charge electrostatically. Always use earthing leads when pouring solvents and transferring product. Operators should wear clothing which does not generate static (at least 60% natural fibre) and antistatic footwear; floors should be of conducting type.

8. Exposure controls and personal protection

8.1. Control parameters

Exposure standards are those provided by the ACGIH (American Conference of Government Industrial Hygenists).

Material	Short term (15 min. ave)		Long term (8hr time weighted average)		Comments
	ppm	mg/m³	ppm	mg/M3	
Ethyl acetate			400	1440	
Xylene	150	655	100	434	

Key to notification

(P) Peak exposure limit
(R) Suppliers Recommended Limit
(Sk) There is a risk of absorption through unbroken skin
(Sen) Sensitiser
(Cat1) Category 1 - established human carcinogen
(Cat2) Category 2 - probable human carcinogen
(Cat3) Category 3 - substances suspected of having carcinogenic potential

DNEL/PNEC values

No Data Available

8.2. Exposure controls

Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapour below occupational exposure limits suitable respiratory protection must be worn.

Eye Protection

Wear safety eyewear, e.g. safety spectacles, goggles or visors to protect against the splash of liquids. Eyewear should comply with an approved standard.

Wear a full face shield if mixing or pouring operations pose a risk of splashes.

An eye wash station is suggested as a good work place practice.

Skin Protection

Gloves of an appropriate material should be worn during mixing and application.

Other

Overalls which cover the body, arms and legs should be worn. Skin should not be exposed. Barrier creams may help to protect areas which are difficult to cover such as the face and neck. They should however not be applied once exposure has occurred. Petroleum jelly based types such as Vaseline should not be used. All parts of the body should be washed after contact.

Respiratory Protection

When concentrations exceed the exposure limits shown above, workers must wear appropriate approved respirators. Provision of other controls such as exhaust ventilation should be considered if practical.

Thermal hazards

No Data Available

9. Physical and chemical properties

Appearance	Colourless Liquid
Odour	Smell of Solvent
Odour threshold	Not Measured
pH	N/A
Melting point / freezing point (°C)	Not Measured
Initial boiling point and boiling range (°C)	137
Flash Point (°C)	34
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	Lower Explosive Limit: 1.1 Upper Explosive Limit: 6.6
Vapour pressure (Pa)	Not Measured
Vapour Density	Heavier than air.
Specific Gravity	0.99
Solubility in Water	Immiscible
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Autoignition temperature (℃)	Not Measured
Decomposition temperature	Not Measured
Viscosity (cSt)	N/A
Molecular Weight	Not Measured

9.2. Other information

No further information

10. Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

Stable under recommended storage and handling conditions (see section 7). When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide, carbon dioxide, oxides of nitrogen and smoke.

Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid possible exothermic reactions.

10.3. Possibility of hazardous reactions

May react exothermically with: oxidising agents, strong alkalis, strong acids.

10.4. Conditions to avoid

Stable under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

Keep away from the following materials: oxidising agents, strong alkalis, strong acids.

10.6. Hazardous decomposition products

Fire will produce dense black smoke. Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.
Avoid exposure and use breathing apparatus as appropriate.

11. Toxicological information

Acute toxicity

Exposure to solvent vapour concentrations from the component solvents in excess of the stated occupational exposure limits may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Symptoms include headache, nausea, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.

Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in dryness, irritation and possible non-allergic contact dermatitis. Solvents may also be absorbed through the skin. Splashes of liquid in the eyes may cause irritation and soreness with possible reversible damage.

The preparation has been assessed using the Acute Toxicity Data listed below, and classified for toxicological hazards accordingly. See section 2 for details.

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapour LD50, mg/L/4hr	Inhalation Dust/Mist LD50, mg/L/4hr
1-Methoxy-2-propylacetate - (108-65-6)	8,532.00, Rat	5,000.00, Rabbit	Not Available	Not Available
Bis(pentamethyl-4-piperidyl)sebacate - (41556-26-7)	2,615.00, Rat	Not Available	Not Available	Not Available
Ethyl acetate - (141-78-6)	5,600.00, Rat	18,000.00, Rabbit	58.60, Rat	Not Available
Xylene - (1330-20-7)	4,299.00, Rat	1,548.00, Rabbit	Not Available	20.00, Rat

Item	Category	Hazard
Acute Toxicity (mouth)	Not Classified	Not Applicable
Acute Toxicity (skin)	Not Classified	Not Applicable
Acute Toxicity (inhalation)	Not Classified	Not Applicable
Skin corrosion/irritation	2	Causes skin irritation.
Eye damage/irritation	2	Causes serious eye irritation.
Sensitization (respiratory)	Not Classified	Not Applicable
Sensitization (skin)	Not Classified	Not Applicable
Germ toxicity	Not Classified	Not Applicable
Carcinogenicity	Not Classified	Not Applicable
Reproductive Toxicity	Not Classified	Not Applicable
Specific target organ systemic toxicity (single exposure)	3	May cause respiratory irritation.
Specific target organ systemic Toxicity (repeated exposure)	Not Classified	Not Applicable
Aspiration hazard	Not Classified	Not Applicable

12. Ecological information

12.1. Toxicity

The preparation has been assessed according to the GHS criteria and is classified as dangerous for the environment, using the toxicity data listed below.

There are no data available on the product itself.

The product should not be allowed to enter drains or water courses.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
1-Methoxy-2-propylacetate - (108-65-6)	100.00, Salmo gairdneri	500.00, Daphnia magna	Not Available
Xylene - (1330-20-7)	Not Available	Not Available	Not Available
Ethyl acetate - (141-78-6)	100.00, Danio rerio	100.00, Daphnia magna	100.00 (72 hr), Desmodesmus subspicatus
Bis(pentamethyl-4-piperidyl)sebacate - (41556-26-7)	1.00, Lepomis macrochirus	20.00, Daphnia magna	Not Available

12.2. Persistence and degradability

There is no data available on the preparation itself.

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available

13. Disposal considerations

13.1. Waste treatment methods

Do not allow into drains or water courses. Wastes and empty containers should be disposed of in accordance with State and Federal regulations.

Using information provided in this data sheet advice should be obtained from the local Waste Regulation Authority as to whether special waste regulations apply.

14. Transport information

14.1. UN number		1263
14.2. UN proper shipping name		Paint
14.3. Transport hazard class(es)		
Road and Rail Transport		UN1263, Paint, CLASS 3, PG III, HAZCHEM *3Y
IMDG reference :	**Class/Div** 3	**Sub Class**
	Ems	F-E,S-E
ICAO/IATA	**Class** 3	**Sub Class**
14.4. Packing group		III

14.5. Environmental hazards

Road and Rail Transport	Environmentally Hazardous: No
	Marine Pollutant: No

IMDG reference :

14.6. Special precautions for user

No further information

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not Applicable

15. Regulatory information

Some non-disclosed ingredients in section 3 can be disclosed in this section 15 by the MoEL Public Notice for MSDS generation. If you want to know the reason why the non-disclosed ingredient in section 3 was informed in this section, please contact Regulatory Affair representative of the material supplier or this safety data sheet provider.

This product and all its components complies with the chemical and transport regulations from the country listed in section 1.3.
Other regulatory information specific to the hazardous chemical(s):

Dangerous Goods Act Class 4 Flammable Liquid, 2nd Petroleum Division, hazard class III

Waste Control Act Hazardous Waste

KOSHA

Please see section 8 in this MSDS for Harmful Factors Subject to Exposure Limit.

Harmful Factors Subject to Work Environment Measurement:

Ethyl acetate

Hazard Substances Subject to Control:

Ethyl acetate

Xylene

Harmful Factors Subject to Special Health Check-up:

Xylene

Harmful Substances Requiring Permission :

(No Product Ingredients Listed)

Harmful Substances Prohibited for Manufacturing, Importing, Transferring, or Supplying:

(No Product Ingredients Listed)

Chemical Substances Control Act

Toxic Chemicals:

Ethyl acetate

Xylene

Observational Chemicals:

(No Product Ingredients Listed)

TRI PRTR Group I:

(No Product Ingredients Listed)

TRI PRTR Group II:

Dibutyltindilaurate

Ethyl acetate

Xylene

Accident Precaution Chemicals:

Ethyl acetate

Restricted Chemicals

(No Product Ingredients Listed)

Banned Chemicals:

(No Product Ingredients Listed)

16. Other information

Revision Date: 04/06/2020

Version: 14

Initial Date: 05/09/2012

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

The information on this SDS is based upon the present state of our knowledge and on current law. The product should not be used for purposes other than shown in the product data sheet without first obtaining written advice.

It is always the responsibility of the user to take all necessary steps to meet the demands of applicable legislation.

The information in this Safety Data Sheet is required according to legislation.

The full text of the phrases appearing in section 3 is:

H225 Highly flammable liquid and vapour.

H226 Flammable liquid and vapour.

H312 Harmful in contact with skin.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H332 Harmful if inhaled.

H336 May cause drowsiness and dizziness.

H372 Causes damage to organs through prolonged or repeated exposure.

This SDS is valid for 5 years from the revised date on page 1.
The revision date is in American format (e.g. MM/DD/YY).

End of document

AkzoNobel

All information concerning this product and/or suggestions for handling and use contained herein are offered in good faith and are believed to be reliable. Akzo Nobel however makes no warranty as to the accuracy of and/or sufficiency of such information.

International Paint (Korea) Limited

Safety Data Sheet

QPA976 INTERTHANE 976 PART B

Version No 8 **Revision Date** 02/07/20

1. Product and company identification

1.1. Product identifier INTERTHANE 976 PART B

Product Code QPA976

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use Cosmetic finish coat
For professional use only.

Application Method Refer Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet
Importer or
Manufacturer

International Paint (Korea) Limited
(8-6B/L Chilseo Industrial Complex),
626-6 Gyenae-Ri,
Chilseo-Myeon, Haman-Gun,
Gyeongsangnam-Do
Korea

Telephone No. 055-632-6286(R&D), 055 586 2310(Fact
Fax No. 055 632-6287(R&D), 055 587 6276(Fact
1.4. Emergency telephone number (24 hour) 055-586-2310(Factory)
For Poisons Advice telephone 055-586-2310(Factory) For Advice to Doctors & Hospitals only

2. Hazard identification of the product

2.1. Classification of the substance or mixture

Flam. Liq. 3;H226	Flammable liquid and vapour.
Acute Tox. 4;H312	Harmful in contact with skin.
Acute Tox. 4;H332	Harmful if inhaled.
Skin Irrit. 2;H315	Causes skin irritation.
Eye Irrit. 2;H319	Causes serious eye irritation.
Skin Sens. 1;H317	May cause an allergic skin reaction.
Resp. Sens. 1;H334	May cause allergy or asthma symptoms of breathing difficulties if inhaled.
STOT SE 3;H335	May cause respiratory irritation. Specific Target Organs: (narcotic effects)
Aquatic Chronic 3;H412	Harmful to aquatic life with long lasting effects.

2.2. Label elements

Using the Toxicity Data listed in section 11 & 12 the product is labelled as follows.



Danger

H226 Flammable liquid and vapour.
H312 Harmful in contact with skin.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H334 May cause allergic or asthmatic symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H412 Harmful to aquatic life with long lasting effects.

[Prevention]:

P210 Keep away from heat / sparks / open flames / hot surfaces - No smoking.
P235 Keep cool.
P240 Ground / bond container and receiving equipment.
P241 Use explosion-proof electrical / ventilating / light / equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing dust / fume / gas / mist / vapours / spray.
P264 Wash thoroughly after handling.
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 / eye protection / face protection.

[Response]:

P302+352 IF ON SKIN: Wash with soap and water.
P303+361+353 IF ON SKIN (or hair): Remove / Take off immediately all contaminated clothing. Rinse skin with water / shower.
P304+312 IF INHALED: Call a POISON CENTER or doctor / physician if you feel unwell.
P305+351+338 IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.
P321 Specific treatment (see information on this label).
P322 Specific measures (see information on this label).
P333+313 If skin irritation or a rash occurs: Get medical advice / attention.
P337 If eye irritation persists:
P304+340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P304+341 If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

P342+311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor / physician.

P362 Take off contaminated clothing and wash before reuse.

P363 Wash contaminated clothing before reuse.

P370+378 In case of fire: Use alcohol resistant foam, CO2, powder, water spray for extinction. Do not use water jet.

[Storage]:

P403+233 Store in a well ventilated place. Keep container tightly closed.

P405 Store locked up.

[Disposal]:

P501 Dispose of contents / container in accordance with local / national regulations.

2.3. Other hazards

This product contains no PBT/vPvB chemicals.

3. Composition/information on ingredients

This product contains the following hazardous substances.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
HDI homopolymer **CAS Number: 0028182-81-2**	**50- <60**	**Skin Sens. 1;H317** **Resp. Sens. 1;H334**	**[1]**
Xylene **CAS Number: 0001330-20-7**	**30- <40**	**Flam. Liq. 3;H226** **Acute Tox. 4;H312** **Acute Tox. 4;H332** **Skin Irrit. 2;H315** **Eye Dam. 2A;H319** **STOT SE 3;H336** **STOT RE 1;H372**	**[1][2]**
Ethyl Benzene **CAS Number: 0000100-41-4**	**5- <10**	**Flam. Liq. 2;H225** **Acute Tox. 4;H332** **STOT RE 2;H373** **Asp. Tox. 1;H304** **Skin Irrit. 2;H315** **Eye Irrit. 2;H319** **STOT SE 3;H335**	**[1][2]**
Hexamethylene diisocyanate **CAS Number: 0000822-06-0**	**0.1 =< ~ < 0.2**	**Acute Tox. 4;H302** **Acute Tox. 3;H311** **Acute Tox. 1;H330** **Skin Irrit. 2;H315** **Eye Irrit. 2;H319** **Skin Sens. 1;H317** **Resp. Sens. 1;H334** **STOT SE 3;H335**	**[1][2]**

[1] Substance classified with a health or environmental hazard.
[2] Substance with a workplace exposure limit.
[3] PBT-substance or vPvB-substance.

*The full texts of the Hazard (H) phrases are shown in Section 16.

There are no additional ingredients present which, within the current knowledge of the supplier and in the

concentrations applicable, are classified as hazardous to health or the environment and hence do not require reporting in this section.

Common Names

0028182-81-2 (HDI homopolymer)

0001330-20-7 (Xylene)

0000100-41-4 (Ethyl Benzene)

0000822-06-0 (Hexamethylene diisocyanate)

4. First aid measures

4.1. Description of first aid measures

General

In all cases of doubt, or when symptoms persist, seek medical attention.

Never give anything by mouth to an unconscious person.

Inhalation

Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

Skin Contact

Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognised skin cleanser. Do NOT use solvents or thinners.

Eye Contact

Irrigate copiously with clean fresh water for at least 10 minutes, holding the eyelids apart and seek medical attention.

Ingestion

If accidentally swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

No data available

4.3. Indication of any immediate medical attention and special treatment needed and notes for physician

No data available

5. Fire-fighting measures

5.1. Extinguishing media

Recommended extinguishing media; alcohol resistant foam, CO_2, powder, water spray.

Do not use - water jet.

Note; Fire will produce dense black smoke. Decomposition products may be hazardous to health. Avoid exposure and use breathing apparatus as appropriate.

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

5.2. Special hazards arising from the substance or mixture

Fire will produce dense black smoke. Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.
Avoid exposure and use breathing apparatus as appropriate.

5.3. Advice for fire-fighters

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Remove sources of ignition, do not turn lights or unprotected electrical equipment on or off. In case of a major spill or spillage in a confined space evacuate the area and check that solvent vapour levels are below the Lower Explosive Limit before re-entering.

6.2. Environmental precautions

Do not allow spills to enter drains or watercourses.

6.3. Methods and material for containment and cleaning up

Ventilate the area and avoid breathing vapours. Take the personal protective measures listed in section 8. Contain and absorb spillage with non-combustible materials e.g. sand, earth, vermiculite. Place in a suitable container. The contaminated area should be cleaned up immediately with a suitable decontaminant. One possible (flammable) decontaminant comprises (by volume): water (45 parts), ethanol or isopropyl alcohol (50 parts), concentrated (d:0,880) ammonia solution (5 parts). A non-flammable alternative is sodium carbonate (5 parts), water (95 parts). Add the same decontaminant to any residues and allow to stand for several days in a non-sealed container until no further reaction occurs. Once this stage is reached, close container and dispose of in accordance with the waste regulations (see section 13). Do not allow spills to enter drains or watercourses.If drains or sewers are contaminated, inform the local water company immediately. In the case of contamination of rivers, streams or lakes the Environmental Protection Agency should also be informed.

7. Handling and storage

7.1. Precautions for safe handling

Handling

Persons with a history of asthma, allergies or chronic or recurrent respiratory disease should only be employed in processes in which this product is used under appropriate medical supervision.

In Storage

Handle containers carefully to prevent damage and spillage.

Precautions should be taken to minimise exposure to atmospheric humidity or water as carbon dioxide may be formed which, in closed containers can result in pressurisation. Care should be taken when re-opening partly used containers.

Naked flames and smoking should not be permitted in storage areas. It is recommended that fork lift trucks and electrical equipment are protected to the appropriate standard.

This coating contains solvents. Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Areas of storage, preparation and application should be ventilated to prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentrations higher than the occupational exposure limits.

7.2. Conditions for safe storage, including any incompatibilities

Keep away from the following materials: oxidising agents, strong alkalis, strong acids.

Avoid skin and eye contact. Avoid inhalation of vapours and spray mists. Observe label precautions. Use personal protection as shown in section 8.

Smoking, eating and drinking should be prohibited in all preparation and application areas.

Never use pressure to empty a container; containers are not pressure vessels.

There are no exposure scenarios, see details in section 1.

7.3. Specific end use(s)

Store in a well ventilated, dry place away from sources of heat and direct sunlight.

Store on concrete or other impervious floor, preferably with bunding to contain any spillage. Do not stack more than 3 pallets high.

Keep container tightly closed. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in the original container or one of the same material.

Prevent unauthorised access.

All sources of ignition (hot surfaces, sparks, open flames etc) should be excluded from areas of preparation and application. All electrical equipment (including torches) should be protected (Ex) to the appropriate standard.

The product may charge electrostatically. Always use earthing leads when pouring solvents and transferring product. Operators should wear clothing which does not generate static (at least 60% natural fibre) and antistatic footwear; floors should be of conducting type.

8. Exposure controls and personal protection

8.1. Control parameters

Exposure standards are those provided by the ACGIH (American Conference of Government Industrial Hygenists).

Material	Short term (15 min. ave)		Long term (8hr time weighted average)		Comments
	ppm	mg/m³	ppm	mg/M3	
Ethyl Benzene	**125**	**545**	**100**	**435**	
HDI homopolymer				**0.02**	
Hexamethylene diisocyanate			**0.005**	**0.034**	
Xylene	**150**	**655**	**100**	**434**	

Key to notification

(P) Peak exposure limit
(R) Suppliers Recommended Limit
(Sk) There is a risk of absorption through unbroken skin
(Sen) Sensitiser
(Cat1) Category 1 - established human carcinogen
(Cat2) Category 2 - probable human carcinogen
(Cat3) Category 3 - substances suspected of having carcinogenic potential

DNEL/PNEC values

No Data Available

8.2. Exposure controls

Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapour below occupational exposure limits suitable respiratory protection must be worn.

Provide adequate ventilation. This should be achieved by the use of local exhaust ventilation and good general extraction. Air-fed protective respiratory equipment must be worn by spray operators even when good ventilation is provided . In other operations, if local exhaust ventilation and good general extraction are not sufficient to maintain concentrations of particulates and solvent vapour below the WEL, suitable respiratory protection must be worn. (See Personal Protection)

Persons with a history of asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this preparation is used.

Examination of lung function should be carried out on a regular basis on persons spraying this preparation.

Eye Protection

Wear safety eyewear, e.g. safety spectacles, goggles or visors to protect against the splash of liquids. Eyewear should comply with an approved standard.

Wear a full face shield if mixing or pouring operations pose a risk of splashes.

An eye wash station is suggested as a good work place practice.

Skin Protection

Gloves of an appropriate material should be worn during mixing and application.

Other

Overalls which cover the body, arms and legs should be worn. Skin should not be exposed. Barrier creams may help to protect areas which are difficult to cover such as the face and neck. They should however not be applied once exposure has occurred. Petroleum jelly based types such as Vaseline should not be used. All parts of the body should be washed after contact.

Respiratory Protection

When concentrations exceed the exposure limits shown above workers must wear appropriate respirators approved in accordance with Directive 89/656/EEC and the Personal Protection Equipment Regulations. Provision of other controls such as exhaust ventilation should be considered if practical.

An air fed respirator must be worn when applying this product in a confined space. Even in open spaces, an air fed respirator should be worn when spraying.
If applying by brush or roller in an open, well ventilated area, air fed respirators could be replaced by a charcoal filter mask.

Thermal hazards
No Data Available

9. Physical and chemical properties

Appearance	Colourless Liquid
Odour	Smell of Solvent
Odour threshold	Not Measured
pH	N/A
Melting point / freezing point (°C)	Not Measured
Initial boiling point and boiling range (°C)	137
Flash Point (°C)	50
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	Lower Explosive Limit: 1.1 Upper Explosive Limit: 6.6
Vapour pressure (Pa)	Not Measured
Vapour Density	Heavier than air.
Specific Gravity	1.02
Solubility in Water	Immiscible
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Autoignition temperature (℃)	Not Measured
Decomposition temperature	Not Measured
Viscosity (cSt)	N/A
Molecular Weight	Not Measured

9.2. Other information
No further information

10. Stability and reactivity

10.1. Reactivity
No data available
10.2. Chemical stability
Stable under recommended storage and handling conditions (see section 7). In a fire, hazardous decomposition products such as smoke, carbon monoxide, carbon dioxide, oxides of nitrogen, hydrogen cyanide may be produced.

Keep away from oxidising agents, strongly alkaline and strongly acid materials, amines, alcohols and water. Uncontrolled exothermic reactions occur with amines and alcohols. The product reacts slowly with water resulting in evolution of carbon dioxide. In closed containers, pressure build up could result in distortion,blowing and in extreme cases bursting of the container.

10.3. Possibility of hazardous reactions

May react exothermically with: oxidising agents, strong alkalis, strong acids.

10.4. Conditions to avoid

Stable under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

Keep away from the following materials: oxidising agents, strong alkalis, strong acids.

10.6. Hazardous decomposition products

Fire will produce dense black smoke. Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.
Avoid exposure and use breathing apparatus as appropriate.

11. Toxicological information

Acute toxicity

Exposure to solvent vapour concentrations from the component solvents in excess of the stated occupational exposure limits may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Symptoms include headache, nausea, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.

Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in dryness, irritation and possible non-allergic contact dermatitis. Solvents may also be absorbed through the skin. Splashes of liquid in the eyes may cause irritation and soreness with possible reversible damage.

Based on the properties of the isocyanate content of this product, respiratory exposure may cause acute irritation and/or sensitisation of the respiratory system resulting in asthmatic symptoms, wheezing and a tightness of the chest. Sensitised persons may subsequently show asthmatic symptoms when exposed to airborne concentrations of isocyanates well below the occupational exposure limit. Repeated exposure may lead to permanent respiratory disability. Persons with a chronic or recurrent respiratory disease should not be employed in any process in which these products are used.

The preparation has been assessed using the Acute Toxicity Data listed below, and classified for toxicological hazards accordingly. See section 2 for details.

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapour LD50, mg/L/4hr	Inhalation Dust/Mist LD50, mg/L/4hr
Ethyl Benzene - (100-41-4)	3,500.00, Rat	15,433.00, Rabbit	17.20, Rat	Not Available
HDI homopolymer - (28182-81-2)	5,000.00, Rat	Not Available	Not Available	Not Available

Hexamethylene diisocyanate - (822-06-0)	Not Available	Not Available	Not Available	Not Available
Xylene - (1330-20-7)	4,299.00, Rat	1,548.00, Rabbit	Not Available	20.00, Rat

Item	Category	Hazard
Acute Toxicity (mouth)	Not Classified	Not Applicable
Acute Toxicity (skin)	4	Harmful in contact with skin.
Acute Toxicity (inhalation)	4	Harmful if inhaled.
Skin corrosion/irritation	2	Causes skin irritation.
Eye damage/irritation	2	Causes serious eye irritation.
Sensitization (respiratory)	1	May cause allergy or asthma symptoms of breathing difficulties if inhaled.
Sensitization (skin)	1	May cause an allergic skin reaction.
Germ toxicity	Not Classified	Not Applicable
Carcinogenicity	Not Classified	Not Applicable
Reproductive Toxicity	Not Classified	Not Applicable
Specific target organ systemic toxicity (single exposure)	3	May cause respiratory irritation.
Specific target organ systemic Toxicity (repeated exposure)	Not Classified	Not Applicable
Aspiration hazard	Not Classified	Not Applicable

12. Ecological information

12.1. Toxicity

The preparation has been assessed according to the GHS criteria and is classified as dangerous for the environment, using the toxicity data listed below.

There are no data available on the product itself.

The product should not be allowed to enter drains or water courses.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
HDI homopolymer - (28182-81-2)	100.00, Danio rerio	100.00, Daphnia magna	100.00 (72 hr), Scenedesmus subspicatus
Xylene - (1330-20-7)	Not Available	Not Available	Not Available
Ethyl Benzene - (100-41-4)	4.20, Oncorhynchus mykiss	2.93, Daphnia magna	3.60 (96 hr), Pseudokirchneriella subcapitata

Hexamethylene diisocyanate - (822-06-0)	82.80, Danio rerio	89.10, Daphnia magna	77.40 (72 hr), Desmodesmus subspicatus

12.2. Persistence and degradability

There is no data available on the preparation itself.

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available

13. Disposal considerations

13.1. Waste treatment methods

Do not allow into drains or water courses. Wastes and empty containers should be disposed of in accordance with State and Federal regulations.

Using information provided in this data sheet advice should be obtained from the local Waste Regulation Authority as to whether special waste regulations apply.

14. Transport information

14.1. UN number 1263

14.2. UN proper shipping name Paint

14.3. Transport hazard class(es)

Road and Rail Transport UN1263, Paint, CLASS 3, PG III, HAZCHEM *3Y

IMDG reference : **Class/Div** 3 **Sub Class**

Ems F-E,S-E

ICAO/IATA **Class** 3 **Sub Class**

14.4. Packing group III

14.5. Environmental hazards

Road and Rail Transport Environmentally Hazardous: No

IMDG reference : Marine Pollutant: No

14.6. Special precautions for user

No further information

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not Applicable

15. Regulatory information

Some non-disclosed ingredients in section 3 can be disclosed in this section 15 by the MoEL Public Notice for MSDS generation. If you want to know the reason why the non-disclosed ingredient in section 3 was informed in this section, please contact Regulatory Affair representative of the material supplier or this safety data sheet provider.

This product and all its components complies with the chemical and transport regulations from the country listed in section 1.3.
Other regulatory information specific to the hazardous chemical(s):

Dangerous Goods Act Class 4 Flammable Liquid, 2nd Petroleum Division, hazard class III

Waste Control Act Hazardous Waste

KOSHA

Please see section 8 in this MSDS for Harmful Factors Subject to Exposure Limit.

Harmful Factors Subject to Work Environment Measurement:

Ethyl Benzene

Hazard Substances Subject to Control:

Ethyl Benzene

Xylene

Harmful Factors Subject to Special Health Check-up:

Ethyl Benzene

Xylene

Harmful Substances Requiring Permission :

(No Product Ingredients Listed)

Harmful Substances Prohibited for Manufacturing, Importing, Transferring, or Supplying:

(No Product Ingredients Listed)

Chemical Substances Control Act

Toxic Chemicals:

Hexamethylene diisocyanate

Xylene

Observational Chemicals:

(No Product Ingredients Listed)

TRI PRTR Group I:
(No Product Ingredients Listed)

TRI PRTR Group II:

Hexamethylene diisocyanate

Ethyl Benzene

Xylene

Accident Precaution Chemicals:
(No Product Ingredients Listed)

Restricted Chemicals
(No Product Ingredients Listed)

Banned Chemicals:
(No Product Ingredients Listed)

16. Other information

Revision Date: 02/07/2020

Version: 8

Initial Date: 05/09/2012

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

The information on this SDS is based upon the present state of our knowledge and on current law. The product should not be used for purposes other than shown in the product data sheet without first obtaining written advice.

It is always the responsibility of the user to take all necessary steps to meet the demands of applicable legislation.

The information in this Safety Data Sheet is required according to legislation.

The full text of the phrases appearing in section 3 is:

H225 Highly flammable liquid and vapour.

H226 Flammable liquid and vapour.

H304 May be fatal if swallowed and enters airways.

H312 Harmful in contact with skin.

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H319 Causes serious eye irritation.

H332 Harmful if inhaled.

H334 May cause allergic or asthmatic symptoms or breathing difficulties if inhaled.

H335 May cause respiratory irritation.

H336 May cause drowsiness and dizziness.

H372 Causes damage to organs through prolonged or repeated exposure.

H373 May cause damage to organs through prolonged or repeated exposure.

This SDS is valid for 5 years from the revised date on page 1.
The revision date is in American format (e.g. MM/DD/YY).

End of document

All information concerning this product and/or suggestions for handling and use contained herein are offered in good faith and are believed to be reliable. Akzo Nobel however makes no warranty as to the accuracy of and/or sufficiency of such information.

Material Safety Data Sheet

DDP SPECIALTY PRODUCTS KOREA LTD.

Product name: MOLYKOTE® 111 Compound **Issue Date:** 2018.10.18
Print Date: 2020.04.30

DDP SPECIALTY PRODUCTS KOREA LTD. encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: MOLYKOTE® 111 Compound

Recommended use of the chemical and restrictions on use
Identified uses: Lubricants and lubricant additives
Uses advised against: We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

COMPANY IDENTIFICATION
DDP SPECIALTY PRODUCTS KOREA LTD.
430, NONHYEON-RO
GANGNAM-GU SEOUL (YEOKSAM_DONG)
SOUTH KOREA

Customer Information Number: +82-2-2222-5200
SDSQuestion-AP@dupont.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 82-2-2222-5600
Local Emergency Contact: 82-2-2222-5600

2. HAZARDS IDENTIFICATION

GHS Classification
This material is not classified as hazardous under the Article 39 Paragraph 1 of the Industrial Safety and Health Act (ISHA). It is not regulated for the MSDS creation and labeling by the provision of Article 41 Paragraph 1 of the ISHA.

GHS label elements

Hazard pictograms	:	Not applicable
Signal word	:	Not applicable
Hazard statements	:	Not applicable
Precautionary statements	:	Not applicable

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	Common Name	CASRN	Concentration	KECI Number
Silicon dioxide	No data available	7631-86-9	>= 10.0 - < 20.0 %	KE-31032
Siloxanes and silicones, dimethyl	No data available	63148-62-9	>= 80.0 - < 90.0 %	KE-31068
Silicone Metalloid Complex	No data available	Trade secret	>= 1.0 - < 10.0 %	-

4. FIRST AID MEASURES

Description of first aid measures
General advice:
If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Skin contact: Wash off with plenty of water.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Ingestion: No emergency medical treatment necessary.

Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical

Unsuitable extinguishing media: None known.

Special hazards arising from the substance or mixture
Hazardous combustion products: Carbon oxides Silicon oxides Boron oxides Formaldehyde

Unusual Fire and Explosion Hazards: Exposure to combustion products may be a hazard to health.

Advice for firefighters
Fire Fighting Procedures: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.

Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Follow safe handling advice and personal protective equipment recommendations.

Environmental precautions: Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up: Wipe up or scrape up and contain for salvage or disposal. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.
See sections: 7, 8, 11, 12 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling: Take care to prevent spills, waste and minimize release to the environment. Handle in accordance with good industrial hygiene and safety practice.
Use only with adequate ventilation. See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Conditions for safe storage: Keep in properly labelled containers. Store in accordance with the particular national regulations.

Do not store with the following product types: Strong oxidizing agents.
Unsuitable materials for containers**:** None known.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value/Notation
Silicon dioxide	Dow IHG	TWA Respirable fraction.	0.2 mg/m3
	KR OEL	TWA	10 mg/m3

Although some of the components of this product may have exposure guidelines, no exposure would be expected under normal handling conditions due to the physical state of the material.

Exposure controls
Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields).

Skin protection

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. Examples of acceptable glove barrier materials include: Natural rubber ("latex"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Wear clean, body-covering clothing.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.
The following should be effective types of air-purifying respirators: Organic vapor cartridge.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Grease
Color	white translucent
Odor	none
Odor Threshold	No data available

pH	Not applicable
Melting point/range	No data available
Freezing point	No data available
Boiling point (760 mmHg)	Not applicable
Flash point	**Seta closed cup** >101.1 °C
Evaporation Rate (Butyl Acetate = 1)	Not applicable
Flammability (solid, gas)	Not classified as a flammability hazard
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapor Pressure	Not applicable
Relative Vapor Density (air = 1)	No data available
Relative Density (water = 1)	1.1
Water solubility	No data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Dynamic Viscosity	Not applicable
Kinematic Viscosity	Not applicable
Explosive properties	Not explosive
Oxidizing properties	The substance or mixture is not classified as oxidizing.
Liquid Density	1.1 g/cm3
Molecular weight	No data available
Particle size	No data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: Not classified as a reactivity hazard.

Chemical stability: Stable under normal conditions.

Possibility of hazardous reactions: Can react with strong oxidizing agents.

Conditions to avoid: None known.

Incompatible materials: Oxidizing agents

Hazardous decomposition products: Formaldehyde.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Information on the likely route of exposure
Please refer to the information below.
Acute toxicity

Acute oral toxicity
Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

As product: Single dose oral LD50 has not been determined.

Based on information for component(s):
LD50, Rat, > 5,000 mg/kg Estimated.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Based on information for component(s):
LD50, Rabbit, > 2,000 mg/kg Estimated. No deaths occurred at this concentration.

Acute inhalation toxicity
Vapors are unlikely due to physical properties. No adverse effects are anticipated from inhalation.
As product: The LC50 has not been determined.

Skin corrosion/irritation
Brief contact is essentially nonirritating to skin.

Serious eye damage/eye irritation
May cause slight temporary eye irritation.
Corneal injury is unlikely.

Skin and Respiratory Sensitization
Contains component(s) which did not cause allergic skin sensitization in guinea pigs.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
For the component(s) tested:
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Carcinogenicity
For the component(s) tested: Did not cause cancer in laboratory animals.

Teratogenicity
For the component(s) tested: Did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive toxicity
For the component(s) tested: In animal studies, did not interfere with reproduction.

Mutagenicity
For the component(s) tested: In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

COMPONENTS INFLUENCING TOXICOLOGY:

Silicon dioxide

Acute inhalation toxicity
Maximum attainable concentration. LC50, Rat, 4 Hour, dust/mist, > 2.08 mg/l No deaths occurred at this concentration.

Siloxanes and silicones, dimethyl

Acute inhalation toxicity
The LC50 has not been determined.

Silicone Metalloid Complex

Acute inhalation toxicity
No adverse effects expected from single exposure.

The LC50 has not been determined.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Ecotoxicity

Silicon dioxide

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Danio rerio (zebra fish), 96 Hour, 5,000 - 10,000 mg/l

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 24 Hour, > 1,000 mg/l

Acute toxicity to algae/aquatic plants
EC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Biomass, 440 mg/l

Siloxanes and silicones, dimethyl

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Fish, 96 Hour, > 100 mg/l

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 48 Hour, > 100 mg/l

Acute toxicity to algae/aquatic plants

EC50, algae, 14 d, > 2,000 mg/l

Chronic toxicity to fish
NOEC, Cyprinodon variegatus (sheepshead minnow), 33 d, 91 mg/l

Toxicity to Above Ground Organisms
Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).
oral LD50, Colinus virginianus (Bobwhite quail), > 5,000 mg/kg

Silicone Metalloid Complex

Acute toxicity to fish
No relevant data found.

Persistence and degradability

Silicon dioxide

Biodegradability: Biodegradation is not applicable.

Siloxanes and silicones, dimethyl

Biodegradability: The product is not biodegradable.

Silicone Metalloid Complex

Biodegradability: No relevant data found.

Bioaccumulative potential

Silicon dioxide

Bioaccumulation: Partitioning from water to n-octanol is not applicable.

Siloxanes and silicones, dimethyl

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Silicone Metalloid Complex

Bioaccumulation: No relevant data found.

Mobility in Soil

Silicon dioxide

No relevant data found.

Siloxanes and silicones, dimethyl

Expected to be relatively immobile in soil (Koc > 5000).

Silicone Metalloid Complex

No relevant data found.

Results of PBT and vPvB assessment

Silicon dioxide

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Siloxanes and silicones, dimethyl

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Silicone Metalloid Complex
This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Other adverse effects

Silicon dioxide
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Siloxanes and silicones, dimethyl
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Silicone Metalloid Complex
This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device. For additional information, refer to: Handling & Storage Information, MSDS Section 7 Stability & Reactivity Information, MSDS Section10 Regulatory Information, MSDS Section 15

Disposal precautions: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

Contaminated packaging: All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations.

14. TRANSPORT INFORMATION

Classification for ROAD and Rail transport:

UN number	Not applicable
Proper shipping name	Not regulated for transport
Class	Not applicable
Packing group	Not applicable
Environmental hazards	Not applicable
Special precautions for user	No data available.

Classification for SEA transport (IMO-IMDG):

UN number	Not applicable
Proper shipping name	Not regulated for transport
Class	Not applicable
Packing group	Not applicable
Marine pollutant	Not applicable
Special precautions for user	No data available.
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

UN number	Not applicable
Proper shipping name	Not regulated for transport
Class	Not applicable
Packing group	Not applicable
Special precautions for user	No data available.

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Regulation under the Occupational Safety and Health Act
The product is not classified as hazardous by ISHL in Korea.

Harmful Substances Prohibited from Manufacturing

Not applicable

Harmful Substances Required Permission for Manufacture

Not applicable

Harmful Agents to be kept below Occupational Exposure Limits

Components	CASRN
Silicon dioxide	7631-86-9

Harmful Agents Required to be kept below Permission Levels

Not applicable

Hazardous substances requiring management

Not applicable

Controlled Substances Subject to Environment Monitoring

Components	CASRN
Silicon dioxide	7631-86-9

Controlled Substances Subject to Health Examination

Components	CASRN
Silicon dioxide	7631-86-9

Regulation under the Chemical Control Act

Toxic Chemicals

Not applicable

Restricted Chemicals

Not applicable

Prohibited Chemicals

Not applicable

Accident Precaution Chemicals

Not applicable

Dangerous Substances Safety Management Act

Not Applicable to Dangerous Materials

Waste Management Law

Industrial waste
Follow article 13 of the act to dispose the product waste

Other requirements in domestic and other countries
Korea. Korean Existing Chemicals Inventory (KECI):
All intentional components are listed on the inventory, are exempt, or are supplier certified.

16. OTHER INFORMATION

Other information

none

Hazard Rating System
NFPA

Health	Flammability	Instability
0	1	0

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Legend

Dow IHG	Dow Industrial Hygiene Guideline

KR OEL	Harmful Agents to be kept below Occupational Exposure Limits
TWA	Time weighted average

Full text of other abbreviations
AICS - Australian Inventory of Chemical Substances; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; CPR - Controlled Products Regulations; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DDP SPECIALTY PRODUCTS KOREA LTD. urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.
KR

(주)루브캠코리아
LUB CHEM KOREA CO.,LTD

LUBCHEM CORPORATION
Material Safety Data Sheet

Version: 1.1
Revision Date: 2016/1/04

LUBCHEM VA 3012 F

1. IDENTIFICATION THE SUBSTANCE AND OF THE COMPANY

Lubchem Corporation **TEL : (82-54)954-8500**
1762, Songgok-ri, Dasan-myeon, Goryeong-gun, **FAX : (82-54)954-0131**
Gyeongsangbuk-do, Korea **WebSite : http://www.lubchem.co.kr**

MSDS No. : Revision Date:

Generic Description: Organic grease
Physical Form: Grease
Color: Dark Beige
Odor: Odorless

2. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

Acute Effects

Eye:	Direct contact may temporary redness and discomfort.
Skin:	No significant irritation expected from a single short-term exposure.
Inhalation:	Irritates respiratory passages very slightly.
Oral:	Low ingestion hazard in normal use.

Prolonged/Repeated Exposure Effects

Skin:	Repeated or prolonged exposure may cause irritation.
Inhalation:	No known applicable information.
Oral:	Repeated ingestion or swallowing large amounts may injure internally.

Signs and Symptoms of Overexposure

No known applicable information.

Medical Conditions Aggravated by Exposure

No known applicable information.

The above listed potential effects of overexposure are based on actual data, results of studies performed upon similar compositions, component data and/or expert review of the products. Please refer to Section 11 for the detailed toxicology information.

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3. COMPOSITIONS/INFORMATION ON INGREDIENTS

Dec-1-ene, Homopolymer, Hydrogenated	(CAS No. : 68037-01-4) 60 ~ 80%
Urea Soap	(CAS No. : 57-13-6) 10~30%
Polytetrafluoroethylene	(CAS No. : 9002-84-0) 5~10%

4. FIRST AID MEASURES

Eye:	Immediately flush with water.
Skin:	No first aid should be needed.
Inhalation:	No first aid should be needed.
Oral:	Get medical attention.
Notes to Physician:	Treat according to person's condition specifies of exposure.

5. FIRE FIGHTING MEASURES

Flash Point:	Not applicable.
Auto ignition Temperature:	Not determined.
Flammability Limits in Air:	Not determined.
Extinguishing Media:	On large fires use dry chemical, foam or water spray. On small fires use carbon dioxide(CO2), dry chemical or water spray. Water can be used to cool fire exposed containers.
Fire Fighting Measures:	Self-contained breathing apparatus and protective clothing should be worn in fighting large fires involving chemicals. Determine the need to evacuate or isolate the area according to your local emergency plan. Use water spray to keep fire exposed containers cool.
Unusual Fire Hazards:	None.

6. ACCIDENTAL RELEASE MEASURES

Containment/Clean up:	Observe all personals protection equipment recommendations described in Sections 5 and 8. Wipe up or scrape up and contain for salvage or disposal. Clean area as appropriate since spilled materials, even in small quantities, may present a slip hazard. Final cleaning may require use of steam, solvents or detergents. Dispose of saturated absorbant or cleaning materials appropriately, since spontaneous heating may occur. Local, state and federal

laws and regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases.

Note: See Section 8 for personal protective Equipment for Spills.

7. HANDLING AND STORAGE

Use with adequate ventilation. At temperatures above 482F/250C this material may produce highly toxic gaseous compounds such as hydrogen fluoride and perfluorohydrocarbons. Provide adequate ventilation or use the appropriate respiratory protection if the possibility of exceeding 482F/250C exists. Avoid contamination of tobacco products. Fluoropolymers on tobacco goods may cause adverse health effects by inhalation of the decomposition products.
Employees should wash their hands and face before eating, drinking or using tobacco products. Avoid eye contact. Do not take internally.

Use reasonable care and store away from oxidizing materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Component Exposures Limits

There are no components with workplace exposure limits.

Engineering Controls

Local Ventilation:	None should be needed.
General Ventilation:	Recommended.

Personal Protective Equipment for Routine Handling

Eyes:	Use proper protection - safety glasses as a minimum.
Skin:	Washing at mealtime and end of shift is adequate.
Suitable Gloves:	Avoid skin contact by implementing good industrial hygiene practices and procedures. and use gloves and/or protective clothing to further minimize the potential for skin contact. Consult with your glove and/or personnel protective equipment manufacturer for selection of appropriate compatible materials.
Inhalation:	No respiratory protection should be needed.
Suitable Respirator:	None should be needed.

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Personal Protective Equipment for Spills

Eyes:	Use proper protection - safety glasses as a minimum.
Skin:	Washing at mealtime and end of shift is adequate.
Inhalation/Suitable Respitator:	No respiratory protection should be needed.
Precautionary Measures:	Avoid eye contact. Do not take internally. Use reasonable care.
Comments:	At temperatures above 482F/250℃ this material may produce highly toxic gaseous compounds such as hydrogen fluoride and perfluorohydrocarbons. Provide adequate ventilation or use the appropriate respiratory protection if the possibility of exceeding 482F/250℃ exists. Avoid contamination of tobacco products. Fluoropolymers on tobacco goods may cause adverse health effectsby inhalation of the decomposition products. Employees should wash their hands and face before eating, drinking or using tobacco products.

Note: These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:	Grease
Color:	Dark Beige
Odor:	Odorless
Specific Gravity@25。C:	0.90
Viscosity:	Not determined.
Freezing/Melting Point:	Not determined.
Boiling Point:	Not determined.
Vapor Density:	Not determined.
Vapor Pressure@25。C:	Not determined.
Solubility in water:	Not determined.
pH:	Not determined.
Volatile Content:	Not determined.
Flash Point:	Not applicable.
Auto-ignition Temperature:	Not determined.
Flammability Limits in Air:	Not determined.

Note: The above information is not intened for use in preparing product specifications.

LUBCHEM VA 3012 F

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable.
Hazardous Polymerization:	Hazardous polymerization will not occur.
Conditions to Avoid:	None.
Materials to Avoid:	Oxidizing material can cause a reaction.

Hazardous Decomposition Products

Thermal breakdown of this product during fire or very high heat conditions may evolve the following decomposition products: Nitrogen oxides. Carbon oxides and traces of incompletely burned carbon compounds. Phosphorous oxides. Fluorine compounds. Metal oxides. Formaldehyde.

11. TOXICOLOGICAL INFORMATION

Component Toxicology Information

No known applicable information.

Special Hazard Information on Components

No known applicable information.

12. OTHER INFORMATION

Prepared by: LUBCHEM KOREA Corporation

These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is herby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

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13. DISPOSAL CONSIDERATION

RCRA Hazard Class

When a decision is made to discard this material, as received, is it classified as a hazardous waste?

No.

State or local laws may impose additional regulatory requirements regarding disposal. Call(82-54)954-8500, if additional information is required.

14. TRANSPORT INFORMATION

DOT Road Shipment Information

Not subject to DOT.

Ocean Shipment(IMDG)

Not subject to IMDG code.

Air Shipment(IATA)

Not subject to IATA regulations.

Call LUBCHEM Sales dept. (82-54)954-8500, if additional information is required.

15. REGULATORY INFORMATION

Regulation by law for industrial safety and health : Article 41.
Other foreign regulations : none

16. OTHER INFORMATION

Prepared by: LUBCHEM KOREA Corporation

These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is herby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Sikaflex®-221
Product code	:	000000601552
Type of product	:	paste

Manufacturer or supplier's details

Company	:	Sika Korea Ltd. 724, Anseongmatchum-daero Miyang-myeon Anseong-si Gyeonggi-do Korea
Telephone	:	+82-31-8056-7777
Emergency telephone number	:	+82-31-8056-7777
Telefax	:	+82-31-8056-7788
E-mail address	:	ehs@kr.sika.com

2. HAZARDS IDENTIFICATION

GHS Classification

Reproductive toxicity	:	Category 1B
Specific target organ toxicity - single exposure	:	Category 2 (Central nervous system, Kidney, Liver, Respiratory Tract)
Specific target organ toxicity - repeated exposure	:	Category 2 (Nervous system, Respiratory Tract)
Specific target organ toxicity - repeated exposure (Inhalation)	:	Category 2 (Central nervous system)
Long-term (chronic) aquatic hazard	:	Category 3

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : H360 May damage fertility or the unborn child.
H371 May cause damage to organs (Central nervous system, Kidney, Liver, Respiratory Tract).
H373 May cause damage to organs (Nervous system, Respiratory Tract) through prolonged or repeated exposure.
H373 May cause damage to organs (Central nervous system)

through prolonged or repeated exposure if inhaled.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements : **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/ fume/ gas/ mist/ vapours/ spray.
P264 Wash the contact area thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.
P281 Use personal protective equipment as required.
Response:
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
Storage:
P405 Store locked up.
Disposal:
P501 Dispose of contents and container (according to the description in the related regulation).

Other hazards which do not result in classification

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	Common Name	CAS-No.	Concentration (%)
xylene	xylenes	1330-20-7	>= 1 - < 5
Hydrocarbons, C9-C12, n-alkanes, isoalkanes, cyclics, aromatics (2-25%)	Naphtha (petroleum), hydrodesulfurized heavy	64742-82-1	>= 1 - < 5
ethylbenzene	ethylbenzene	100-41-4	>= 0.1 - < 1
4,4'-methylenediphenyl diisocyanate	4,4'-methylenediphenyl diisocyanate	101-68-8	0 - < 1
[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	[3-(2,3-epoxypropoxy)propyl]trimethoxysilane	2530-83-8	0 - < 1

4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.

In case of eye contact	:	Remove contact lenses. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
In case of skin contact	:	Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. If symptoms persist, call a physician.
If inhaled	:	Move to fresh air. Consult a physician after significant exposure.
If swallowed	:	Clean mouth with water and drink afterwards plenty of water. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed	:	No known significant effects or hazards. See Section 11 for more detailed information on health effects and symptoms. May damage fertility or the unborn child. May cause damage to organs. May cause damage to organs through prolonged or repeated exposure. May cause damage to organs through prolonged or repeated exposure if inhaled.
Notes to physician	:	Treat symptomatically.

5. FIREFIGHTING MEASURES

Suitable and unsuitable extinguishing media

Suitable extinguishing media	:	Carbon dioxide (CO2)
Unsuitable extinguishing media	:	Water
Hazardous combustion products	:	No hazardous combustion products are known
Specific extinguishing methods	:	Standard procedure for chemical fires.
Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Deny access to unprotected persons.
Environmental precautions	:	Try to prevent the material from entering drains or water courses.

Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Avoid exceeding the given occupational exposure limits (see section 8). Do not get in eyes, on skin, or on clothing. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Follow standard hygiene measures when handling chemical products
Conditions for safe storage	:	Store in original container. Keep in a well-ventilated place. Observe label precautions. Store in accordance with local regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
xylene	1330-20-7	TWA	100 ppm	KR OEL
		STEL	150 ppm	KR OEL
		TWA	100 ppm	ACGIH
		STEL	150 ppm	ACGIH
ethylbenzene	100-41-4	STEL	125 ppm	KR OEL
	Further information: Limited evidence of carcinogenicity in humans or animals, which is not sufficiently convincing to place the substance in Category 1			
		TWA	100 ppm	KR OEL
	Further information: Limited evidence of carcinogenicity in humans or animals, which is not sufficiently convincing to place the substance in Category 1			
		TWA	20 ppm	ACGIH
		STEL	125 ppm	ACGIH
4,4'-methylenediphenyl diisocyanate	101-68-8	TWA	0.005 ppm	KR OEL
	Further information: Limited evidence of carcinogenicity in humans or animals, which is not sufficiently convincing to place the substance in Category 1			
		TWA	0.005 ppm	ACGIH

Personal protective equipment

Respiratory protection	:	Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates

that exposures are within recommended exposure guidelines. The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self-contained breathing apparatus must be used.

Eye protection	:	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary.
Hand protection	:	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Skin and body protection	:	Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	paste
Colour	:	various
Odour	:	very faint
Odour Threshold	:	No data available
pH	:	Not applicable
Melting point/range / Freezing point	:	No data available
Boiling point/boiling range	:	No data available
Flash point	:	ca. 64.6 °C (148.3 °F) Method: closed cup
Evaporation rate	:	No data available
Flammability	:	No data available
Upper/Lower explosion limit		
Upper explosion limit	:	No data available
Lower explosion limit	:	No data available

Vapour pressure	:	No data available
Solubility(ies)		
Water solubility	:	insoluble
Relative vapour density	:	No data available
Density	:	1.26 g/cm3 (23 °C (73 °F) ())
Partition coefficient: n-octanol/water	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	Not applicable
Explosive properties	:	No data available
Molecular weight	:	No data available

10. STABILITY AND REACTIVITY

Chemical stability and possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use. The product is chemically stable. Stable under recommended storage conditions.
Conditions to avoid	:	No data available
Incompatible materials	:	No data available
Hazardous decomposition products	:	No decomposition if stored and applied as directed.

11. TOXICOLOGICAL INFORMATION

Health hazard information

Acute toxicity

Not classified based on available information.

Components:

xylene:

Acute oral toxicity	:	LD50 Oral (Rat): 3,523 mg/kg
Acute dermal toxicity	:	LD50 Dermal (Rabbit): 1,700 mg/kg

ethylbenzene:

Acute oral toxicity	:	LD50 Oral (Rat): 3,500 mg/kg

Acute dermal toxicity : LD50 Dermal (Rabbit): 5,510 mg/kg

4,4'-methylenediphenyl diisocyanate:

Acute oral toxicity : LD50 Oral (Rat): > 4,700 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : Acute toxicity estimate: 1.5 mg/l
Test atmosphere: dust/mist
Method: Expert judgement

[3-(2,3-epoxypropoxy)propyl]trimethoxysilane:

Acute oral toxicity : LD50 Oral (Rat): 7,010 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 5.3 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Acute dermal toxicity : LD50 Dermal (Rabbit): 4,248 mg/kg

Skin corrosion/irritation

Not classified based on available information.

Serious eye damage/eye irritation

Not classified based on available information.

Respiratory or skin sensitisation

Skin sensitisation: Not classified based on available information.
Respiratory sensitisation: Not classified based on available information.

Carcinogenicity

Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Components:

4,4'-methylenediphenyl diisocyanate:

Genotoxicity in vivo : Species: Bacteria
Method: OECD Test Guideline 471
Result: negative

Method: TA98

Method: TA100

Method: TA1535

Method: TA1537

Reproductive toxicity

May damage fertility or the unborn child.

STOT - single exposure

May cause damage to organs (Central nervous system, Kidney, Liver, Respiratory Tract).

STOT - repeated exposure

May cause damage to organs (Nervous system, Respiratory Tract) through prolonged or repeated exposure.
May cause damage to organs (Central nervous system) through prolonged or repeated exposure if inhaled.

Aspiration toxicity

Not classified based on available information.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

xylene:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 3.3 mg/l Exposure time: 96 h

[3-(2,3-epoxypropoxy)propyl]trimethoxysilane:

Toxicity to fish	:	LC50 (Cyprinus carpio (Carp)): 55 mg/l Exposure time: 96 h

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

Product:

Additional ecological information	:	There is no data available for this product.

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

Disposal precautions

Dispose of in accordance with local regulations.

14. TRANSPORT INFORMATION

International Regulations

UNRTDG
Not regulated as a dangerous good

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

UN number	:	Not applicable
Proper shipping name	:	Not applicable
Class	:	Not applicable
Subsidiary risk	:	Not applicable
Packing group	:	Not applicable
Labels	:	Not applicable
EmS Code	:	Not applicable
Marine pollutant	:	Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

National Regulations
Refer to section 15 for specific national regulation.

Special precautions for user
Not applicable

15. REGULATORY INFORMATION

National regulatory information

Regulation under the Occupational Safety and Health Act

Harmful Substances Prohibited from Manufacturing
Not applicable

Harmful Substances Required Permission for Manufacture
Not applicable

Hazardous substances requiring management

Chemical name	CAS-No.	Threshold limits (%)
Xylene	1330-20-7	>= 1 Vol-%
Ethyl benzene	100-41-4	>= 1 Vol-%

Controlled Substances Subject to Environment Monitoring

Chemical name	CAS-No.	Threshold limits (%)
Titanium dioxide	13463-67-7	>= 1 %
Xylene, o,m,p-isomers	1330-20-7	>= 1 %

Controlled Substances Subject to Health Examination

Chemical name	CAS-No.	Threshold limits (%)
Xylene	1330-20-7	>= 1 %

Act on the Registration and Evaluation, etc. of Chemical Substances, Chemicals Control Act

Toxic Chemicals
Not applicable

Observational chemicals
Not applicable

Restricted Chemicals
Not applicable

Prohibited Chemicals
Not applicable

Toxic Release Inventory

Chemical name	CAS-No.	Group	Threshold limits (%)
Xylene (o-,m-,p- isomer mixture)	1330-20-7	Group II	>= 1 %
Ethylbenzene	100-41-4	Group II	>= 0.1 %

Accident Precaution Chemicals
Not applicable

Dangerous Substances Safety Management Act

Classification : Group 4, Flammable liquids, Type 2 petroleums, Water insoluble liquid

Hazard rank : Hazardous rank III

Designated Quantity : 1000 litre

Safety Warning : Keep away from fire

International Chemical Weapons Convention (CWC) Schedules of Toxic Chemicals and Precursors : Not applicable

Wastes Control Act

Industrial waste
Follow article 13 of the act to dispose the product waste

Other requirements in domestic and other countries

The components of this product are reported in the following inventories:

REACH : Not in compliance with the inventory

ENCS : Not in compliance with the inventory

ISHL : Not in compliance with the inventory

KECI : Not in compliance with the inventory

16. OTHER INFORMATION

Issuing date : 22.12.2015

Revision number and date

Number of Revision	:	3.1
Revision Date	:	02.11.2018
Date format	:	yyyy/mm/dd

The information contained in this Safety Data Sheet corresponds to our level of knowledge at the time of publication. All warranties are excluded. Our most current General Sales Conditions shall apply. Please consult the product data sheet prior to any use and processing.

(주)루브캠코리아
LUB CHEM KOREA CO.,LTD

LUBCHEM CORPORATION
Material Safety Data Sheet

Version: 1.1
Revision Date: 2020/01/02

LUBCHEM CA 8242 HS

1. IDENTIFICATION THE SUBSTANCE AND OF THE COMPANY

Lubchem Corporation
1762, Songgok-ri, Dasan-myeon, Goryeong-gun,
Gyeongsangbuk-do, Korea
TEL : (82-54)954-8500
FAX : (82-54)954-0131
WebSite : http://www.lubchem.co.kr

MSDS No. :
Revision Date:

Generic Description: Organic grease
Physical Form: Grease
Color: White
Odor: Odorless

2. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

Acute Effects

Eye: Direct contact may temporary redness and discomfort.
Skin: No significant irritation expected from a single short-term exposure.
Inhalation: Irritates respiratory passages very slightly.
Oral: Low ingestion hazard in normal use.

Prolonged/Repeated Exposure Effects

Skin: Repeated or prolonged exposure may cause irritation.
Inhalation: No known applicable information.
Oral: Repeated ingestion or swallowing large amounts may injure internally.

Signs and Symptoms of Overexposure

No known applicable information.

Medical Conditions Aggravated by Exposure

No known applicable information.

The above listed potential effects of overexposure are based on actual data, results of studies performed upon similar compositions, component data and/or expert review of the products. Please refer to Section 11 for the detailed toxicology information.

LUBCHEM CA 8242 HS

3. COMPOSITIONS/INFORMATION ON INGREDIENTS

1. Dimethypolysiloxane (CAS No. : 63148-62-9) 65~75%
2. Polytetrafluoroethylene (CAS No. : 9002-84-0) 25~35%

4. FIRST AID MEASURES

Eye:	Immediately flush with water.
Skin:	No first aid should be needed.
Inhalation:	No first aid should be needed.
Oral:	Get medical attention.
Notes to Physician:	Treat according to person's condition specifies of exposure.

5. FIRE FIGHTING MEASURES

Flash Point:	Not applicable.
Auto ignition Temperature:	Not determined.
Flammability Limits in Air:	Not determined.
Extinguishing Media:	On large fires use dry chemical, foam or water spray. On small fires use carbon dioxide(CO2), dry chemical or water spray. Water can be used to cool fire exposed containers.
Fire Fighting Measures:	Self-contained breathing apparatus and protective clothing should be worn in fighting large fires involving chemicals. Determine the need to evacuate or isolate the area according to your local emergency plan. Use water spray to keep fire exposed containers cool.
Unusual Fire Hazards:	None.

6. ACCIDENTAL RELEASE MEASURES

Containment/Clean up:	Observe all personals protection equipment recommendations described in Sections 5 and 8. Wipe up or scrape up and contain for salvage or disposal. Clean area as appropriate since spilled materials, even in small quantities, may present a slip hazard. Final cleaning may require use of steam, solvents or detergents. Dispose of saturated absorbant or cleaning materials appropriately, since spontaneous heating may occur. Local, state and federal

laws and regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases.

Note: See Section 8 for personal protective Equipment for Spills.

7. HANDLING AND STORAGE

Use with adequate ventilation. At temperatures above 482F/250C this material may produce highly toxic gaseous compounds such as hydrogen fluoride and perfluorohydrocarbons. Provide adequate ventilation or use the appropriate respiratory protection if the possibility of exceeding 482F/250C exists. Avoid contamination of tobacco products. Fluoropolymers on tobacco goods may cause adverse health effects by inhalation of the decomposition products.
Employees should wash their hands and face before eating, drinking or using tobacco products. Avoid eye contact. Do not take internally.

Use reasonable care and store away from oxidizing materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Component Exposures Limits

There are no components with workplace exposure limits.

Engineering Controls

Local Ventilation:	None should be needed.
General Ventilation:	Recommended.

Personal Protective Equipment for Routine Handling

Eyes:	Use proper protection - safety glasses as a minimum.
Skin:	Washing at mealtime and end of shift is adequate.
Suitable Gloves:	Avoid skin contact by implementing good industrial hygiene practices and procedures. and use gloves and/or protective clothing to further minimize the potential for skin contact. Consult with your glove and/or personnel protective equipment manufacturer for selection of appropriate compatible materials.
Inhalation:	No respiratory protection should be needed.
Suitable Respirator:	None should be needed.

LUBCHEM CA 8242 HS

Personal Protective Equipment for Spills

Eyes:	Use proper protection - safety glasses as a minimum.
Skin:	Washing at mealtime and end of shift is adequate.
Inhalation/Suitable Respitator:	No respiratory protection should be needed.
Precautionary Measures:	Avoid eye contact. Do not take internally. Use reasonable care.
Comments:	At temperatures above 482F/250℃ this material may produce highly toxic gaseous compounds such as hydrogen fluoride and perfluorohydrocarbons. Provide adequate ventilation or use the appropriate respiratory protection if the possibility of exceeding 482F/250℃ exists. Avoid contamination of tobacco products. Fluoropolymers on tobacco goods may cause adverse health effectsby inhalation of the decomposition products. Employees should wash their hands and face before eating, drinking or using tobacco products.

Note: These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:	Grease
Color:	White
Odor:	Odorless
Specific Gravity@25。C:	1.0
Viscosity:	Not determined.
Freezing/Melting Point:	Not determined.
Boiling Point:	Not determined.
Vapor Density:	Not determined.
Vapor Pressure@25。C:	Not determined.
Solubility in water:	Not determined.
pH:	Not determined.
Volatile Content:	Not determined.
Flash Point:	Not applicable.
Auto-ignition Temperature:	Not determined.
Flammability Limits in Air:	Not determined.

Note: The above information is not intened for use in preparing product specifications.

LUBCHEM CA 8242 HS

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable.
Hazardous Polymerization:	Hazardous polymerization will not occur.
Conditions to Avoid:	None.
Materials to Avoid:	Oxidizing material can cause a reaction.

Hazardous Decomposition Products

Thermal breakdown of this product during fire or very high heat conditions may evolve the following decomposition products: Nitrogen oxides. Carbon oxides and traces of incompletely burned carbon compounds. Phosphorous oxides. Fluorine compounds. Metal oxides. Formaldehyde.

11. TOXICOLOGICAL INFORMATION

Component Toxicology Information

No known applicable information.

Special Hazard Information on Components

No known applicable information.

12. OTHER INFORMATION

Prepared by: LUBCHEM KOREA Corporation

These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is herby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

LUBCHEM CA 8242 HS

13. DISPOSAL CONSIDERATION

RCRA Hazard Class

When a decision is made to discard this material, as received, is it classified as a hazardous waste? No.

State or local laws may impose additional regulatory requirements regarding disposal. Call(82-54)954-8500, if additional information is required.

14. TRANSPORT INFORMATION

DOT Road Shipment Information

Not subject to DOT.

Ocean Shipment(IMDG)

Not subject to IMDG code.

Air Shipment(IATA)

Not subject to IATA regulations.

Call LUBCHEM Sales dept. (82-54)954-8500, if additional information is required.

15. REGULATORY INFORMATION

Regulation by law for industrial safety and health : Article 41.
Other foreign regulations : none

16. OTHER INFORMATION

Prepared by: LUBCHEM KOREA Corporation

These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is herby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

Safety Data Sheet

LOCTITE® 242™ THREADLOCKER MEDIUM STRENGTH

SDS No. : 150233
V001.4
Revision: 06.03.2018
printing date: 17.12.2018

1. Identification of the substance/preparation and of the company/undertaking

A. Product name: LOCTITE® 242™ THREADLOCKER MEDIUM STRENGTH

B. Purpose of the product and limitations:

Purpose of the product Anaerobic
Limitations Prohibition on use except the above

C. Identification of manufacturer, importer or distributor

Importer: Henkel Korea Limited, 121-734, 8th Floor, Henkel Tower Bldg., 41, Mapo-daero 4da-gil, Mapo-gu, Seoul, Korea.
Phone : +82-2-3279-1700

Emergency information: +82-2-3279-1700 or Emergency tel : +82-2-3279-1707 (24hr)

D. Writer division and contact person:
Product Safety & Regulatory Affairs for South Korea, msdsakorea@henkel.com

2. Hazards and Risk identification

A. Hazard Classification:

Hazard Class	Hazard Category	Target organ
Serious eye damage/eye irritation	Category 2	
Specific target organ toxicity - single exposure	Category 3	Respiratory irritation

B. Item of labeling with Risk and Safety assessment phrase:

Hazard pictogram:



Signal word: Warning

Hazard statement:
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H412 Harmful to aquatic life with long lasting effects.

Precautionary Statement(s):
Prevention:
P261 Avoid breathing mist/vapours.
P264 Wash thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear eye protection/face protection.

Response:
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.
P312 Call a POISON CENTER/doctor/… if you feel unwell.
P337+P313 If eye irritation persists: Get medical advice/attention.

Storage:
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 Wastes Control Act .

C. Possible Hazards: None if used properly.

3. Composition / information on ingredients

General description: Mixture

Chemical name	Other name(s)	CAS No. or ID No.	Contents (%)
Polyglycol dimethacrylate	Polyglycol dimethacrylate	Proprietary	60 - 70 %
Modifier	Modifier	Proprietary	1 - 10 %
Silica, amorphous, fumed, crystal-free	Silica, amorphous, fumed, cryst.-free	112945-52-5	1 - 10 %
Alkyl hydroperoxide	Alkyl hydroperoxide	Proprietary	1 - < 3 %
Glycol	Glycol	Proprietary	1 - 10 %

All remaining chemical compositions are trade secret and are not subject to GHS classification according to the Ministry of Employment and Labor Public Notice.

4. First aid measures

A. After eye contact:
Flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time.
Get medical attention.

B. After skin contact:
Wash with soap and water.
Remove contaminated clothing and footwear.
Wash clothing before reuse.
If symptoms develop and persist, get medical attention.

C. After inhalation: Move to fresh air.
If breathing is difficult, give oxygen.
If breathing has stopped, give artificial respiration, and get medical attention immediately.

D. After ingestion: Do not induce vomiting.
Keep individual calm.
Get medical attention.

E. Others / Medical advice: Treat symptomatically and supportively.

5. Explosion / Fire fighting measures

A. Suitable (and unsuitable) extinguishing media:

Suitable extinguishing media: Foam, dry chemical or carbon dioxide.

B. Special exposure hazard arising from product itself:

Hazardous combustion products: Oxides of carbon.
Oxides of sulfur.
Oxides of nitrogen.
Irritating organic vapours.

Fire and Explosion Risk: None

C. Special protective equipments for firefighters and safety measures:
Wear protective equipment.

6. Accidental release measures

A. Personal precautions / measures and equipments:
Ensure adequate ventilation.

B. Environmental precautions / measures:
Do not allow product to enter sewer or waterways.

C. Methods of cleaning up / removing:
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Store in a partly filled, closed container until disposal.

7. Handling and storage

A. Safety Handling precaution:

Safety Handling precaution: Use only in well-ventilated areas.
Gloves and safety glasses should be worn
Prolonged or repeated skin contact should be avoided to minimise any risk of sensitisation.

B. Suitable storage conditions:

Suitable storage conditions: Store in original containers at 8-21°C (46.4-69.8°F) and do not return residual materials to containers as contamination may reduce the shelf life of the bulk product.

8. Exposure controls / personal protection

A. Component exposure limits:

Hazardous components	National standard	OSHA	ACGIH
Polyglycol dimethacrylate	none	None	none
Modifier	none	None	none
Silica, amorphous, fumed, crystal-free 112945-52-5	none	20 MPPCF TWA 0.8 mg/m3 TWA	 10 mg/m3 TWA 3 mg/m3 TWA
Alkyl hydroperoxide	none	None	none
Glycol	none	None	none

B. Engineering controls: Ensure good ventilation/suction at the workplace.

C. Personal protective equipments:

- **Respiratory protection:** An approved mask or respirator fitted with an organic vapour cartridge should be worn if the product is used in a poorly ventilated area
- **Eye protection:** Safety goggles or safety glasses with side shields.
- **Skin protection:** Use impermeable gloves and protective clothing as necessary to prevent skin contact.
- Neoprene gloves.
- Butyl rubber gloves.
- Natural rubber gloves.
- **Personal protection:**

Good industrial hygiene practices should be observed.

9. Physical and chemical properties

A. Appearance (physical state, color): Liquid
Blue
B. Odor: Mild
C. Odor threshold value: Not available.
D. pH: Not applicable
E. Melting point / Freezing point: Not available.
F. Boiling point: > 149 °C (> 300.2 °F)
G. Flash point: > 93.3 °C (> 199.94 °F)
H. Speed of volatilization: Not available.
I. Flammability: Not applicable
J. Upper flammable /Lower flammable:
2.6 %(V)
lower [vol%] 12.5 %(V)
upper [vol%] (propylene glycol)

K. Vapor pressure: < 6.67 mbar
L. Solubility: Slightly soluble
M. Vapor density: Not available.
N. Specific Gravity: 1.1
O. N-Octanol / Water partition coefficient: Not available.
P. Self ignition point: Not available.
Q. Decomposition: Not available.
R. Viscosity: 800 - 1,600 mPa.s
()GRP 2

S. Molecular Weight: Not available.

10. Stability and reactivity

A. Chemical stability: Stable under recommended storage conditions.

B. Possibility of hazardous polymerization: Will not occur.

C. Avoid condition (discharge of static electricity, shock, vibration): See "Handling and Storage" (Section 7) and "Incompatibility" (Section 10).

D. Avoid materials:
Strong oxidizing agents.
Free radical initiators.
Strong reducing agents.
Alkalis.
Oxygen scavengers.
Other polymerization initiators.
Copper.
Iron.
Zinc.
Aluminum.
Rust.

E. Decomposition products:
Oxides of carbon.
Oxides of sulfur.
Oxides of nitrogen.
Irritating organic vapours.

11. Toxicological information

A. Information for exposure route: Skin, Inhalation, Eyes

B. Information for health and hazard identification:

Acute toxicity:

Hazardous components CAS-No.	Value type	Value	Route of application	Exposure time	Species	Method
Alkyl hydroperoxide Proprietary	LD50 LD50	550 mg/kg 1,200 - 1,520 mg/kg	oral dermal		rat	not specified not specified
Glycol Proprietary	LD50 LC0 LD50	22,000 mg/kg 317.042 mg/l > 2,000 mg/kg	oral inhalation dermal	 2 h	rat rabbit rabbit	not specified not specified not specified

Skin corrosion/irritation:

Hazardous components CAS-No.	Result	Exposure time	Species	Method
Silica, amorphous, fumed, crystal-free 112945-52-5	not irritating		rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
Alkyl hydroperoxide Proprietary	corrosive		rabbit	Draize Test
Glycol Proprietary	not irritating	4 h	rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)

Serious eye damage/irritation:

Hazardous components CAS-No.	Result	Exposure time	Species	Method
Silica, amorphous, fumed, crystal-free 112945-52-5	not irritating		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
Glycol Proprietary	not irritating		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)

Respiratory or skin sensitization:

Hazardous components CAS-No.	Result	Test type	Species	Method
Glycol Proprietary	not sensitising	Guinea pig maximisation test	guinea pig	OECD Guideline 406 (Skin Sensitisation)

Germ cell mutagenicity:

Hazardous components CAS-No.	Result	Type of study / Route of administration	Metabolic activation / Exposure time	Species	Method
Silica, amorphous, fumed, crystal-free 112945-52-5	negative negative negative	bacterial reverse mutation assay (e.g Ames test) mammalian cell gene mutation assay in vitro mammalian chromosome aberration test	with and without with and without with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay) OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test) OECD Guideline 473 (In vitro Mammalian Chromosome Aberration Test)
Alkyl hydroperoxide Proprietary	positive	bacterial reverse mutation assay (e.g Ames test)	without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Alkyl hydroperoxide Proprietary	negative	dermal		mouse	not specified
Glycol Proprietary	negative negative	bacterial reverse mutation assay (e.g Ames test) in vitro mammalian chromosome aberration test	without with and without		Ames Test OECD Guideline 473 (In vitro Mammalian Chromosome Aberration Test)
Glycol Proprietary	negative negative negative	oral: gavage intraperitoneal oral: gavage		rat mouse rat	not specified not specified not specified

Carcinogenicity: No data available.

Reproductive toxicity: No data available.

Specific Target Organ Toxicity - Single exposure : No data available.

Specific Target Organ Toxicity – Repeated exposure :

Hazardous components CAS-No.	Hazard category	Target Organs
Alkyl hydroperoxide	Category 2	No data available.

Aspiration hazard: No data available.

Additional Health Hazard Information

Ingredients	Hazard class	Hazard category	Route of exposure	Target organ(s)
Polyglycol dimethacrylate	No classification required.			
Modifier	No classification required.			
Silica, amorphous, fumed, crystal-free	No classification required.			
Alkyl hydroperoxide	Acute toxicity	Category 4	Oral	
	Acute toxicity	Category 3	Inhalation	
	Acute toxicity	Category 4	Dermal	
	Skin corrosion/irritation	Category 1		
	Target Organ Systemic Toxicant - Repeated exposure	Category 2		
Glycol	No classification required.			

12. Ecological information

A. Ecological toxicity

Hazardous components CAS-No.	Value type	Value / Remark	Acute Toxicity Study	Exposure time	Species	Method
Polyglycol dimethacrylate	LC50	> 100 mg/l	Fish	96 h	Danio rerio	OECD Guideline 203 (Fish, Acute Toxicity Test)
Modifier	LC50	18.3 mg/l	Fish	96 h	Pimephales promelas	OECD Guideline 203 (Fish, Acute Toxicity Test)
Silica, amorphous, fumed, crystal-free 112945-52-5	LC50	> 10,000 mg/l	Fish	96 h	Brachydanio rerio (new name: Danio rerio)	OECD Guideline 203 (Fish, Acute Toxicity Test)
Silica, amorphous, fumed, crystal-free 112945-52-5	EL50	> 1,000 mg/l	Daphnia	24 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Silica, amorphous, fumed, crystal-free 112945-52-5	NOELR	10,000 mg/l	Algae	72 h	Desmodesmus subspicatus	OECD Guideline 201 (Alga, Growth Inhibition Test)
	EL50	> 10,000 mg/l	Algae	72 h	Desmodesmus subspicatus	OECD Guideline 201 (Alga, Growth Inhibition Test)
Silica, amorphous, fumed, crystal-free 112945-52-5	EC0	10,000 mg/l	Bacteria	30 min	Pseudomonas putida	DIN 38412, part 27 (Bacterial oxygen consumption test)
Alkyl hydroperoxide	LC50	3.9 mg/l	Fish	96 h	Oncorhynchus mykiss	OECD Guideline 203 (Fish, Acute Toxicity Test)
Alkyl hydroperoxide	EC 50	7 mg/l	Daphnia	24 h	Water flea (Daphnia magna)	
	EC50	18 mg/l	Daphnia	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Alkyl hydroperoxide	ErC50	3.1 mg/l	Algae	72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
Alkyl hydroperoxide	EC10	70 mg/l	Bacteria	30 min		not specified
Glycol	LC50	> 10,000 mg/l	Fish	48 h	Leuciscus idus	DIN 38412-15
Glycol	EC50	34,400 mg/l	Daphnia	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Glycol	EC50	19,000 mg/l	Algae	14 d	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)
	NOEC	15,000 mg/l	Algae	14 d	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)
Glycol	EC50	> 1,000 mg/l	Bacteria	3 h	activated sludge	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)

B. Persistence / degradability:

Hazardous components CAS-No.	Result	Route of application	Degradability	Method

Polyglycol dimethacrylate	readily biodegradable	aerobic	84.3 %	OECD Guideline 301 C (Ready Biodegradability: Modified MITI Test (I))
Alkyl hydroperoxide		no data	0 %	OECD Guideline 301 B (Ready Biodegradability: CO2 Evolution Test)
Glycol	not inherently biodegradable	aerobic	60 %	OECD Guideline 302 B (Inherent biodegradability: Zahn-Wellens/EMPA Test)
	readily biodegradable	aerobic	> 70 %	OECD Guideline 301 A (new version) (Ready Biodegradability: DOC Die Away Test)

C. Bioaccumulative Potential

Hazardous components CAS-No.	LogPow	Bioconcentration factor (BCF)	Exposure time	Species	Temperature	Method
Alkyl hydroperoxide		9.1		calculation		OECD Guideline 305 (Bioconcentration: Flow-through Fish Test)

D. Soil Mobility

Hazardous components CAS-No.	LogPow	Bioconcentration factor (BCF)	Exposure time	Species	Temperature	Method
Modifier	0.91					not specified
Silica, amorphous, fumed, crystal-free 112945-52-5	0.53					QSAR (Quantitative Structure Activity Relationship)
Alkyl hydroperoxide	2.16					not specified
Glycol	-1.07				20.5 °C	EU Method A.8 (Partition Coefficient)

E. Other Adverse Effects: Do not empty into drains, soil or bodies of water.

Additional Ecotoxicity

Ingredients	Hazard class	Hazard category
Alkyl hydroperoxide	Chronic hazards to the aquatic environment	Category 2

13. Disposal considerations

A. Disposal method:

Dispose of in accordance with local and national regulations.

B. Waste information (including waste method of contaminated container and packaging):

Waste disp. packag. not clean:After use, tubes, cartons and bottles containing residual product should be disposed of as chemically contaminated waste in an authorised legal land fill site or incinerated., Disposal must be made according to official regulations.

14. Transport information

A. UN number: Not classified as dangerous goods for transport
B. UN proper shipping name: Not applicable
C. Transport hazard class: Not applicable
D. Packing group (if applicable): Not applicable
E. Marine pollution (yes/no): Not applicable
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: Not hazardous according to RID, ADR, ADN, IMDG, IATA-DGR.

15. Regulatory information

A. According to Industrial Safety & Health Act:

Harmful Substances Prohibited from Manufacturing:
Neither banned nor restricted

Harmful Substances Requiring Permission for Manufacture or Use:
Neither banned nor restricted

Harmful Substances Requiring Workplace Environment Monitoring:
Silica, amorphous, fumed, crystal-free

Controlled Hazardous Substances:
Neither banned nor restricted

Harmful Substances Requiring Special Medical Examination:
Silica, amorphous, fumed, crystal-free

Korea OELs:
Neither banned nor restricted

B. According to Chemicals Control Law:

Toxic Chemicals:
Neither banned nor restricted

Banned Toxic Chemicals:
Neither banned nor restricted

Restricted Toxic Chemicals:
Neither banned nor restricted

Accidental Release Prevention Substances:
Neither banned nor restricted

C. According to Dangerous Substances Safety Management Act Enforcement Rule :
4th Class Flammable Liquids, Class 3 Petroleum

D. According to Enforcement Decree of The wastes control Act :

Designated Wastes, Appendix 4, Code Numbers.
Designated Wastes

E. According to other regulations:
Not available.

16. Other information

A. Reference:

www.KOSHA.net
IUCLID
Henkel MSDS …..etc.
NCIS
HSDB(Hazardous Substances Data Bank): http://toxnet.nlm.nih.gov
The Chemical Database: http://ull.chemistry.uakron.edu/erd/

B. Date of creation:	07.03.2012
C. Revision number and the latest version date	V001.4 06.03.2018
D. Disclaimer:	This information is based on our current level of knowledge and relates to the product in the state in which it is delivered. It is intended to describe our products from the point of view of safety requirements and is not intended to guarantee any particular properties. The data contained herein are furnished for information only and are believed to be reliable. However, Henkel Corporation and its affiliates ("Henkel") does not assume responsibility for any results obtained by persons over whose methods Henkel has no control. It is the user's responsibility to determine the suitability of Henkel's products or any production methods mentioned herein for a particular purpose, and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use of any Henkel's products. In light of the foregoing, Henkel specifically disclaims all warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, arising from sale or use of Henkel's products. Henkel further disclaims any liability for consequential or incidental damages of any kind, including lost profits.

Safety Data Sheet

LOCTITE® 263™ THREADLOCKER

SDS No. : 347828
V001.2
Revision: 12.10.2018
printing date: 17.12.2018

1. Identification of the substance/preparation and of the company/undertaking

A. Product name: LOCTITE® 263™ THREADLOCKER

B. Purpose of the product and limitations:

Purpose of the product Adhesive
Limitations Prohibition on use except the above

C. Identification of manufacturer, importer or distributor

Importer: Henkel Korea Limited, 121-734, 8th Floor, Henkel Tower Bldg., 41, Mapo-daero 4da-gil, Mapo-gu, Seoul, Korea.
Phone : +82-2-3279-1700

Emergency information: +82-2-3279-1700 or Emergency tel : +82-2-3279-1707 (24hr)

D. Writer division and contact person:
Product Safety & Regulatory Affairs for South Korea, msdsakorea@henkel.com

2. Hazards and Risk identification

A. Hazard Classification:

Hazard Class	Hazard Category	Target organ
Skin corrosion/irritation	Category 2	
Serious eye damage/eye irritation	Category 2	
Skin sensitizer	Category 1	
Specific target organ toxicity - single exposure	Category 3	Respiratory irritation

B. Item of labeling with Risk and Safety assessment phrase:

Hazard pictogram:



Signal word: Warning

Hazard statement:
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

Precautionary Statement(s):

Prevention:
P261 Avoid breathing mist/vapours.
P264 Wash thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves, eye protection, and face protection.

Response:
P302+P352 IF ON SKIN: Wash with plenty of water.
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.
P312 Call a POISON CENTER/doctor/… if you feel unwell.
P321 Specific treatment (see on this label).
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+P364 Take off contaminated clothing and wash it before reuse.

Storage:
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 Wastes Control Act .

C. Possible Hazards: None if used properly.

3. Composition / information on ingredients

General description: Mixture

Chemical name	Other name(s)	CAS No. or ID No.	Contents (%)
Methacrylate monomer	Methacrylate monomer	Proprietary	20 - 30 %
Polyglycol dimethacrylate	Polyglycol dimethacrylate	Proprietary	20 - 30 %
thickener	thickener	Proprietary	20 - 30 %
Polyglycol dimethacrylate	Polyglycol dimethacrylate	Proprietary	1 - 10 %
Alkyl hydroperoxide	Alkyl hydroperoxide	Proprietary	1 - < 3 %
Acetic acid, 2-phenylhydrazide	Acetic acid, 2-phenylhydrazide	114-83-0	0.1 - < 1 %

All remaining chemical compositions are trade secret and are not subject to GHS classification according to the Ministry of Employment and Labor Public Notice.

4. First aid measures

A. After eye contact: Flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time.
Get medical attention.

B. After skin contact: Wash with soap and water.
Remove contaminated clothing and footwear.
Wash clothing before reuse.
If symptoms develop and persist, get medical attention.

C. After inhalation: Move to fresh air.
If symptoms develop and persist, get medical attention.

D. After ingestion: Do not induce vomiting.
Keep individual calm.
Get medical attention.

E. Others / Medical advice: Treat symptomatically and supportively.

5. Explosion / Fire fighting measures

A. Suitable (and unsuitable) extinguishing media:

Suitable extinguishing media: If product is involved in fire extinguish with dry powder, foam or carbon dioxide.

B. Special exposure hazard arising from product itself:

Hazardous combustion products: Oxides of carbon.
Oxides of nitrogen.
Thermal decomposition can lead to release of irritating gases and vapors.

Fire and Explosion Risk: None

C. Special protective equipments for firefighters and safety measures:
Wear self contained breathing apparatus.

6. Accidental release measures

A. Personal precautions / measures and equipments:
Avoid skin and eye contact.
Ensure adequate ventilation.

B. Environmental precautions / measures:
Do not let product enter drains.

C. Methods of cleaning up / removing:
For small spills wipe up with paper towel and place in container for disposal.
For large spills absorb onto inert absorbent material and place in sealed container for disposal.

7. Handling and storage

A. Safety Handling precaution:

Safety Handling precaution: Prevent contact with eyes, skin and clothing. Do not breathe vapor and mist. Wash thoroughly after handling.

B. Suitable storage conditions:

Suitable storage conditions: Store in original containers at 8-21°C (46.4-69.8°F) and do not return residual materials to containers as contamination may reduce the shelf life of the bulk product.

8. Exposure controls / personal protection

A. Component exposure limits:

Hazardous components	National standard	OSHA	ACGIH
Methacrylate monomer	none	None	none
Polyglycol dimethacrylate	none	None	none
thickener	none	None	none
Polyglycol dimethacrylate	none	None	none
Alkyl hydroperoxide	none	None	none
Acetic acid, 2-phenylhydrazide 114-83-0	none	None	none

B. Engineering controls: Ensure good ventilation/extraction.

C. Personal protective equipments:

- **Respiratory protection:** Use only in well-ventilated areas.
- **Eye protection:** Safety goggles or safety glasses with side shields.
- **Skin protection:** Use impermeable gloves and protective clothing as necessary to prevent skin contact.
- Natural rubber gloves.
- Neoprene gloves.
- Butyl rubber gloves.
- **Personal protection:**

Good industrial hygiene practices should be observed.

9. Physical and chemical properties

A. Appearance (physical state, color):	Liquid Red
B. Odor:	Characteristic
C. Odor threshold value:	Not available.
D. pH:	Not available.
E. Melting point / Freezing point:	Not available.
F. Boiling point:	Not determined
G. Flash point:	107 °C (224.6 °F)
H. Speed of volatilization:	Not available.
I. Flammability:	Not applicable
J. Upper flammable /Lower flammable:	Not available.
K. Vapor pressure:	Not available.
L. Solubility:	Slightly soluble
M. Vapor density:	Not available.
N. Specific Gravity:	1.08
O. N-Octanol / Water partition coefficient:	Not available.
P. Self ignition point:	Not available.
Q. Decomposition:	Not available.
R. Viscosity:	400 - 600 mPa.s
S. Molecular Weight:	Not available.

10. Stability and reactivity

A. Chemical stability: Stable under recommended storage conditions.

B. Possibility of hazardous polymerization: Will not occur.

C. Avoid condition (discharge of static electricity, shock, vibration): See "Handling and Storage" (Section 7) and "Incompatibility" (Section 10).

D. Avoid materials:
Strong oxidizing agents.
Reducing agents.
Strong acids and strong bases.
Oxygen scavengers.
Other polymerization initiators.
Heavy metals.

E. Decomposition products:
Oxides of carbon.
Oxides of nitrogen.
Irritating organic vapours.

11. Toxicological information

A. Information for exposure route: Skin, Inhalation, Eyes

B. Information for health and hazard identification:

Acute toxicity:

Hazardous components CAS-No.	Value type	Value	Route of application	Exposure time	Species	Method
Polyglycol dimethacrylate Proprietary	LD50 LD50	10,837 mg/kg > 2,000 mg/kg	oral dermal		rat mouse	not specified not specified
Alkyl hydroperoxide Proprietary	LD50 LD50	550 mg/kg 1,200 - 1,520 mg/kg	oral dermal		rat	not specified not specified
Acetic acid, 2-phenylhydrazide 114-83-0	LD50	270 mg/kg	oral		rat	not specified

Skin corrosion/irritation:

Hazardous components CAS-No.	Result	Exposure time	Species	Method
Polyglycol dimethacrylate Proprietary	not irritating	24 h	rabbit	Draize Test
Alkyl hydroperoxide Proprietary	corrosive		rabbit	Draize Test

Serious eye damage/irritation:

Hazardous components CAS-No.	Result	Exposure time	Species	Method
Polyglycol dimethacrylate Proprietary	not irritating		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)

Respiratory or skin sensitization:

Hazardous components CAS-No.	Result	Test type	Species	Method
Polyglycol dimethacrylate Proprietary	sensitising	Mouse local lymphnode assay (LLNA)	mouse	OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)

Germ cell mutagenicity:

Hazardous components CAS-No.	Result	Type of study / Route of administration	Metabolic activation / Exposure time	Species	Method
Polyglycol dimethacrylate Proprietary	negative negative negative	mammalian cell gene mutation assay bacterial reverse mutation assay (e.g Ames test) in vitro mammalian cell micronucleus test	with and without with and without with and without		OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test) OECD Guideline 471 (Bacterial Reverse Mutation Assay) OECD Guideline 487 (In vitro Mammalian Cell Micronucleus Test)
Alkyl hydroperoxide Proprietary	positive	bacterial reverse mutation assay (e.g Ames test)	without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Alkyl hydroperoxide Proprietary	negative	dermal		mouse	not specified

Carcinogenicity:

Hazardous components CAS-No.	Hazard category	Route of exposure
Acetic acid, 2-phenylhydrazide 114-83-0	Category 2	

Reproductive toxicity: No data available.

Specific Target Organ Toxicity - Single exposure :

Hazardous components CAS-No.	Hazard category	Target Organs
Methacrylate monomer	Category 3	No data available.
Acetic acid, 2-phenylhydrazide 114-83-0	Category 3	No data available.

Specific Target Organ Toxicity – Repeated exposure :

Hazardous components CAS-No.	Hazard category	Target Organs
Alkyl hydroperoxide	Category 2	No data available.

Aspiration hazard: No data available.

Additional Health Hazard Information

Ingredients	Hazard class	Hazard category	Route of exposure	Target organ(s)
Methacrylate monomer	Skin corrosion/irritation	Category 2		
	Serious eye damage/eye irritation	Category 2		
	Target Organ Systemic Toxicant - Single exposure	Category 3		respiratory tract irritation
Polyglycol dimethacrylate	No classification required.			
thickener	No classification required.			
Polyglycol dimethacrylate	Skin sensitizer	Category 1		
Alkyl hydroperoxide	Acute toxicity	Category 4	Oral	
	Acute toxicity	Category 3	Inhalation	
	Acute toxicity	Category 4	Dermal	
	Skin corrosion/irritation	Category 1		
	Target Organ Systemic Toxicant - Repeated exposure	Category 2		
Acetic acid, 2-phenylhydrazide	Acute toxicity	Category 3	Oral	
	Skin corrosion/irritation	Category 2		
	Serious eye damage/eye irritation	Category 2		
	Skin sensitizer	Category 1		
	Carcinogenicity	Category 2		

12. Ecological information

A. Ecological toxicity

Hazardous components CAS-No.	Value type	Value / Remark	Acute Toxicity Study	Exposure time	Species	Method
Polyglycol dimethacrylate	LC50	> 100 mg/l	Fish	96 h	Danio rerio	OECD Guideline 203 (Fish, Acute Toxicity Test)
	LC50	16.4 mg/l	Fish	96 h	Danio rerio	OECD Guideline 203 (Fish, Acute Toxicity Test)
Polyglycol dimethacrylate	EC50	> 100 mg/l	Algae	72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
	NOEC	18.6 mg/l	Algae	72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
Alkyl hydroperoxide	LC50	3.9 mg/l	Fish	96 h	Oncorhynchus mykiss	OECD Guideline 203 (Fish, Acute Toxicity Test)
Alkyl hydroperoxide	EC50	18 mg/l	Daphnia	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Alkyl hydroperoxide	ErC50	3.1 mg/l	Algae	72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
Alkyl hydroperoxide	EC10	70 mg/l	Bacteria	30 min		not specified

B. Persistence / degradability:

Hazardous components CAS-No.	Result	Route of application	Degradability	Method
Polyglycol dimethacrylate	readily biodegradable	aerobic	84.3 %	OECD Guideline 301 C (Ready Biodegradability: Modified MITI Test (I))
	readily biodegradable	aerobic	85 %	OECD Guideline 301 B (Ready Biodegradability: CO2 Evolution Test)
Alkyl hydroperoxide		no data	0 %	OECD Guideline 301 B (Ready Biodegradability: CO2 Evolution Test)

C. Bioaccumulative Potential

Hazardous components CAS-No.	LogPow	Bioconcentration factor (BCF)	Exposure time	Species	Temperature	Method
Alkyl hydroperoxide		9.1		calculation		OECD Guideline 305 (Bioconcentration: Flow-through Fish Test)

D. Soil Mobility

Hazardous components CAS-No.	LogPow	Bioconcentration factor (BCF)	Exposure time	Species	Temperature	Method
Polyglycol dimethacrylate	2.3					OECD Guideline 117 (Partition Coefficient (n-octanol / water), HPLC Method)
Alkyl hydroperoxide	2.16					not specified
Acetic acid, 2-phenylhydrazide 114-83-0	0.74					not specified

E. Other Adverse Effects: Do not empty into drains, soil or bodies of water.

Additional Ecotoxicity

Ingredients	Hazard class	Hazard category
Alkyl hydroperoxide	Chronic hazards to the aquatic environment	Category 2

13. Disposal considerations

A. Disposal method:

Dispose of in accordance with local and national regulations.

B. Waste information (including waste method of contaminated container and packaging):

Waste disp. packag. not clean:Disposal must be made according to official regulations.

14. Transport information

A. UN number:	Not classified as dangerous goods for transport
B. UN proper shipping name:	Not applicable
C. Transport hazard class:	Not applicable
D. Packing group (if applicable):	Not applicable
E. Marine pollution (yes/no):	Not applicable
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:	Not hazardous according to RID, ADR, ADN, IMDG, IATA-DGR.

15. Regulatory information

A. According to Industrial Safety & Health Act:

Harmful Substances Prohibited from Manufacturing:
Neither banned nor restricted

Harmful Substances Requiring Permission for Manufacture or Use:
Neither banned nor restricted

Harmful Substances Requiring Workplace Environment Monitoring:
Neither banned nor restricted

Controlled Hazardous Substances:
Neither banned nor restricted

Harmful Substances Requiring Special Medical Examination:
Neither banned nor restricted

Korea OELs:
Neither banned nor restricted

B. According to Chemicals Control Law:

Toxic Chemicals:
Neither banned nor restricted

Banned Toxic Chemicals:
Neither banned nor restricted

Restricted Toxic Chemicals:
Neither banned nor restricted

Accidental Release Prevention Substances:
Neither banned nor restricted

C. According to Dangerous Substances Safety Management Act Enforcement Rule :

4th Class Flammable Liquids, Class 3 Petroleum (Non Water Soluble)

D. According to Enforcement Decree of The wastes control Act :

Designated Wastes, Appendix 4, Code Numbers.
Designated Wastes

E. According to other regulations:

Not available.

16. Other information

A. Reference:	www.KOSHA.net IUCLID Henkel MSDS …..etc. NCIS
B. Date of creation:	08.01.2017
C. Revision number and the latest version date	V001.2 12.10.2018
D. Disclaimer:	This Safety Data Sheet has been generated based on KOSHA Standard (MoEL Notice No. 2016-19) and provides information in accordance with Korea law only. No warranty or representation of any kind is given with respect to the substantive or export laws of any other jurisdiction or country. Please confirm that the information provided herein conforms to the substantive export or other law of any other jurisdiction prior to export. Please contact Henkel Product Safety and Regulatory Affairs for additional assistance.This information is based on our current level of knowledge and relates to the product in the state in which it is delivered. It is intended to describe our products from the point of view of safety requirements and is not intended to guarantee any particular properties. The data contained herein are furnished for information only and are believed to be reliable. However, Henkel Corporation and its affiliates ("Henkel") does not assume responsibility for any results obtained by persons over whose methods Henkel has no control. It is the user's responsibility to determine the suitability of Henkel's products or any production methods mentioned herein for a particular purpose, and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use of any Henkel's products. In light of the foregoing, Henkel specifically disclaims all warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, arising from sale or use of Henkel's products. Henkel further disclaims any liability for consequential or incidental damages of any kind, including lost profits.