

Material Safety Data Sheet(MSDS)

1. Substance/preparations and company identification

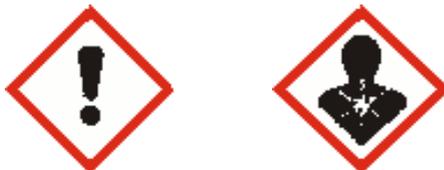
- A. Product name : COSMONATE M-200
- B. Relevant identified uses of the substance or mixture and uses advised against
Component in manufacturing of polyurethane compounds(eg for architecture, furniture, automobile parts, home appliances and industrial use)
- C. Details of the supplier of the safety data sheet.
Company name : KUMHO MITSUI CHEMICALS INC,
Head office) East wing 11F, SignatureTowers Seoul, 100 Cheonggyecheon-ro, Jung-gu, Seoul,
Korea Plant) 305, Yeosusandan2-ro, Yeosu-si Jeonnam 555-290, korea
- D. Emergency telephone number.
Tel) 82-61-688-5000 (9:00 am to 5:00 pm, Mon to Fri, Korean time)

2.Hazard identification

- A. Classification of substance according to Regulation (EC) No. 1272/2008
- Acute Toxicity.(inhalation dust, mist): Cat.4
 - Skin Corrosion/Irritation: Cat.2
 - Serious Eye Damage/Eye Irritation: Cat.2
 - Respiratory Sensitization: Cat.1
 - Carcinogenicity: Cat.2
 - Skin Sensitization: Cat.1
 - Specific Target Organ Toxicity-Single: Cat.3
 - Specific Target Organ Toxicity-Repeated: Cat.2
- B. Classification of substance according to Directive 67/548/EEC
- Xn, R20-48/20
 - Xi, R36/37/38, R42/43
 - Carc Cat 3, R40

C. Label elements and hazard statement

Pictogram



Signal Word : Danger

- Hazard statements

- H315 : Causes skin irritation.
- H317 : May cause an allergic skin reaction.
- H319 : Causes serious eye irritation.
- H332 : Harmful if inhaled.
- H334 : May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H335 : May cause respiratory irritation.
- H351 : Suspected of causing cancer.
- H373 : May cause damage to organs through prolonged or repeated exposure.

- 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/vapors/spray.
- P261 : Avoid breathing dust/fume/gas/mist/vapours/spray.
- P264 : Wash ... thoroughly after handling.(cont'd)
- P271 : Use only outdoors or in a well-ventilated area.
- P272 : Contaminated work clothing should not be allowed out of workplace.
- P280 : Wear protective gloves/protective clothing/eye protection/face protection.
- P281 : Use personal protective equipment as required.
- P285 : In case of inadequate ventilation wear respiratory protection.

- Precautionary statements(Response)

- P312 : Call a POISON CENTER or doctor/physician if you feel unwell.
- P314 : Get medical advice/attention if you feel unwell.
- P321 : Specific treatment.
- P362 : Take off contaminated clothing and wash before reuse.
- P363 : Wash contaminated clothing before reuse.
- P302+P352 : IF ON SKIN: Wash with plenty of soap and water.
- P304+P340 : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P304+P341 : IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position 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
- P332+P313 : If skin irritation or rash 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.
- P308+P313 : If exposed or concerned get medical advice/attention.

- Precautionary statements(Storage)

- P405 : Store locked up.
- P403+P233 : Store in a well-ventilated place. Keep container tightly closed.

- Precautionary statements(Disposal)

- P501 : Dispose of contents/container to ...

D. Other hazard

Ingredient	NFPA Ratings		
	Health	Fire	Reactivity
Polymethylene polyphenyl isocyanate	No data	No data	No data

3. Composition/information on ingredients

Component	CAS Number	Content(w/w %)
Polymethylene polyphenyl isocyanate	9016-87-9	100

4. First-Aid Measures

A. Eye contact

If in eyes, rinse cautiously with room-temperature water for several minutes.
Remove contact lenses if present and easy to do.
If eye irritation persists, get medical attention.

B. Skin contact

Remove contaminated clothing and wash affected area with soap and water (or, if available, polyethylene glycol, followed by copious water).
Get medical attention if irritation or rash occurs.
Launder contaminated clothing before re-use.

C. Inhalation

If inhaled, remove victim to fresh air and keep at rest in a position comfortable for breathing.
If symptoms persist, get medical attention.

D. Ingestion

If swallowed, wash out mouth thoroughly and give water to drink.
Get prompt medical attention.
Do not induce vomiting, unless instructed by medical personnel.

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

If inhaled, the product may cause harmful effects, respiratory irritation, and difficulty in breathing.

F. Indication of any immediate medical attention and special treatment needed

Treat symptoms as they occur.

5. Fire-Fighting Measures

A. Extinguishing media

Dry chemical powder, carbon dioxide, water spray or alcohol-resistant foam.
For larger fires, use water spray, fog or regular foam.

B. Hazardous combustion products

The product is not flammable, but may decompose if involved in a fire, producing smoke, and toxic vapours and gases (including hydrogen cyanide).

C. Fire fighting

Move container from fire area if you can do it without risk.
Leave a maximum space when fight a fire.
Stay away from ends of tanks.

Do not scatter spilled material with high-pressure water streams.
Dike fire-control water for later disposal.
Use agents suitable for type of surrounding fire.
Avoid inhalation noxious vapor, keep with one's own back to the wind.

6. Accidental Release Measures

A. Personal precautions

- Do not touch spilled material.
- Ensure adequate ventilation.
- For large-scale spills, ensure full personal protection is worn.
- Evacuate unauthorized personnel from spillage area.

B. Environmental precautions.

- Prevent product from entering water courses or drainage system by using bunding or absorption with inert material.

C. Methods for cleaning up or taking up

- For large spills, recover by taking up mechanically or with an inert absorbent material such as waster cloth, dry sand, or earth.
 - For small spills, wipe off with cloth or paper.
 - Collect spill and place in a container for disposal. Wash contaminated surfaces with water and detergent, And collect washing for safe disposal.
 - Neutralize with a solution of 5~10% Sodium carbonate, 0.2~2% detergents and 90~95% water.
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7. Handling and Storage

A. Precautions for safe handling

- Observe all federal, state and local regulations when storing this substance.
- Should be handled in a ventilated area.
- Do not eat, drink or smoke in working area.

B. Conditions for safe storage, including any incompatibilities

- Use disposable containers and tools where possible.
 - Store in a cool, well-ventilated area between 5~35 °C, away from direct sunlight.
 - Product reacts with moisture, so keep container tightly closed when not in use.
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8. Exposure controls and personal protection

A. Exposure limits

Component	Korean Regulation	ACGIH Regulation	Biological Exposure limit
Polymethylene polyphenyl isocyanate	No data	No data	No data

- ※ Note. TWA : time-weighted average
STEL: short term exposure limit

B. Exposure controls

Engineering controls

- Local exhaust ventilation or use in a closed system is recommended.

Personal protective equipment

- The need for personal protective equipment should be based on a workplace risk assessment for the particular use.
- Avoid skin and eye contact by wearing chemical resistant gloves (eg nitrile rubber, Viton) and eye protection/face shield. Where more extensive contact may occur, wear protective clothing (eg apron, overalls). Wear respiratory protective equipment (eg vapour mask) if exposure to vapours is possible.
- Facilities for eye washing and showering are recommended within the immediate work area.

9. Physical and Chemical Properties

- A. Description: DARK AMBER TO BROWN, VISCOUS LIQUID.
- B. Odor: MUSTY
- C. Odor threshold value: Not available
- D. pH: Not available
- E. Melting point : <0℃ (<32°F)
- F. Initial boiling point & boiling point range: 200~208℃ (392~406°F)
- G. Flashing point: >200℃
- H. Vaporization velocity: Not available.
- I. Flammability (solid, gas): Not available
- J. Ignition or explosion range maximum/minimum: Not available
- K. Vapor pressure: 1*10⁻⁵hpa(at 25℃)
- L. Solubility: Not soluble in water (reacts); soluble in benzene, nitrobenzene, acetone, chlorobenzene
- M. Vapor density: 8.6
- N. Specific gravity: 1.23(at 25℃)
- O. N-octanol/water division coefficient: 10.46
- P. Spontaneous combustion temp.: > 600℃
- Q. Decomposition temp.: 329℃
- R. Viscosity: 150~220cps (25℃)
- S. Molecular weight: Not available

10. Stability and Reactivity

A. Reactivity

Reacts slowly and exothermically on contact with water, generating sufficient heat and pressure to rupture the container in a closed system.

B. Conditions to avoid

High temperatures, flame, and moisture.

C. Incompatibilities

- Reacts with water. The following materials may react violently, producing heat: acid, alcohol, aluminium Amine, and base. Oxidising agents may produce a fire or explosion hazard.

D. Hazardous decomposition products

Thermal decomposition products may include highly toxic fumes of hydrogen cyanide and toxic oxides of carbon and nitrogen.

11. Toxicological information

A. HEALTH EFFECTS

• SKIN CONTACT

- The product is expected to cause skin irritation and may produce temporary dark staining of the skin.
- The product is expected to cause respiratory and skin sensitisation.
- Isocyanate products are associated with asthma and other respiratory disorders, and skin allergies such as eczema.

• Carcinogenicity

- Suspected of causing cancer. There is limited evidence of carcinogenicity in humans and from animal studies.

• EYE CONTACT

- May cause irritation with redness, pain, and blurred vision
- Repeated and prolonged contact with irritants may cause conjunctivitis.

• Germ cell mutagenicity

- Not classified due to lack of data.

• Reproductive toxicity

- Not classified due to lack of data.

• STOT-single exposure

- The product may cause respiratory irritation if inhaled.

• STOT-repeated exposure

- May cause damage to the respiratory system through prolonged or repeated exposure.

• Aspiration hazard

- Not expected to meet the criteria for classification.

• Acute toxicity

- The product is classified as toxic by inhalation route. May cause irritation of the respiratory system, chest pain, breathing difficulty, and impaired lung function. High concentration may produce chemical pneumonia and inflammation which may be fatal. Other symptoms include headache, nausea, and fever.
- Acute Tox. : LD50 rat(oral):>2,000mg/kg
- Acute Tox.(including STOT(single exposure)): LC50 rat(by inhalation): approx.0.493mg/l 4h
- Acute Tox.(Inhalation: vapor) : Category 4

12. Ecological information

A. Toxicity

- Not toxic to fish, Daphnia, or bacteria

B. Persistence and degradability

- Biodegradability is expected to be low, so that the product may persist in the environment.

C. Bioaccumulation potential

- Not available

D. Mobility in soil

- Not available

E. Other adverse effects

- Not available

13. Disposal Considerations

A. Disposal method

The recommended method of disposal is incineration. Disposal via the drains or landfill is not recommended. Use a licensed waste disposal contractor. Disposal must be in accordance with current national and local regulations. Chemical residues generally count as special waste. General EU requirements are given in Directive 2008/98/EC. Product or wastes may be neutralized with a solution of 5~10% sodium carbonate, 0.2-2% detergent, and 90~95% water. Containers of this Material may be hazardous when emptied due to product residue.

14. Transport Information

A. UN number

- Not classified as dangerous goods for transport

B. UN proper shipping name

- Not applicable

C. Dangerousness grade of transportation

- Not applicable

D. Container grade

- Not applicable

E. Substance of sea pollution

- Not marine pollutant/environmentally hazardous

F. Safety countermeasure

Emergency action(fire) : without corresponding

Emergency action(outflow) : without corresponding

15. Regulatory Information

A. Safety, health and environmental regulations/legislation specific for the substance or mixture

- Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006: None
- Substances in Candidate List (Art, 59 REACH) : None
- Substances subject to authorisation (Annex XIV REACH) : None
- Substances subject to exportation reporting pursuant to (EC) Reg. 689/2008 : None
- Substances subject to Rotterdam Convention : None
- Substances subject to Stockholm Convention : None
- UK: Control of substances Hazardous to Health Regulations 2002(COSHH), as amended
- Workplace Exposure Limits EH40/2005 (Second edition published 2011), Health and Safety Executive.

B. Chemical safety assessment

- Not available
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16. Other Information

A. Reference

EU : http://ec.europa.eu/enterprise/reach/docs/ghs/ghs_prop_vol_iii_en.pdf

KOREA : <http://www.kosha.net>

UN GHS File

ECHA: <http://clp-inventory.echa.europa.eu/>

<http://kischem.nier.go.kr/kischem2/wsp/main/main.jsp>

EU Indicative Occupational Exposure Limit Values (IOELVs): Directives 2000/39/EC, 2006/15/EC and 2009/161/EU

B. List of R-phrases / S-phrases

- R20: Harmful by inhalation.
- R36/37/38: Irritating to eyes, respiratory system and skin.
- R40: Limited evidence of a carcinogenic effect.
- R42/43: May cause sensitization by inhalation and skin contact.
- R48/20: Harmful: danger of serious damage to health by prolonged exposure through inhalation.
- S1/2: Keep locked up and out of the reach of children.
- S23: Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
- S36/37: Wear suitable protective clothing and gloves.
- R45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

C. Registration number: 01-2119457014-47-0011(4,4'-methylene diphenyl diisocyanate)

D. Creation date : 2004. 03. 23

E. Revision date

- 1st revision : 2010. 07. 26
- 2nd revision : 2012. 02. 16
- 3rd revision : 2012. 05. 11
- 4th revision: 2012.06.25

F. The others : -