SAFETY DATA SHEET

Flexane 80P Resin

Date of issue: 2016-02-04
Revision date: 2016-02-04
Version: R0002.0001

1. IDENTIFICATION

A. Product name
- Flexane 80P Resin

B. Recommended use and restriction on use
- General use: Rubber ripair
- Restriction on use: Do not use except in prescribed application.

2. HAZARD IDENTIFICATION

A. GHS Classification
- Acute toxicity (inhalation: vapor) : Category4
- Skin corrosion/irritation : Category2
- Serious eye damage/irritation : Category2A
- Respiratory sensitization : Category1
- Skin sensitization : Category1
- Specific target organ toxicity(Single exposure) : Category3(Respiratory tract irritation)
- Specific target organ toxicity(Repeated exposure) : Category2

B. GHS label elements
- Hazard symbols
- Signal words
  - 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.
  - H337 May cause damage to organs through prolonged or repeated exposure (Refer Section SDS 11)
- Precautionary statements
  1) Prevention
    - 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.
    - P280 Wear protective gloves/protective clothing/eye protection/face protection.
    - P285 In case of inadequate ventilation wear respiratory protection.
  2) Response
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Trade names and Synonyms</th>
<th>CAS No.</th>
<th>Content(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>polyetherpolyol</td>
<td>Listed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,1’-Methylenebis[4-isocyanatocyclohexane]</td>
<td>4,4’-Methylenedicyclohexyl disocyanate</td>
<td>5124-30-1</td>
<td>20-30</td>
</tr>
<tr>
<td>Isocyanic acid polymethylene polyphenylene ester</td>
<td>Polymethylene polyphenylene disocyanate</td>
<td>9016-87-9</td>
<td>1-10</td>
</tr>
<tr>
<td>1,1’-Methylenebis[isocyanatobenzene]</td>
<td>Methylene diphenyl disocyanate</td>
<td>26447-40-5</td>
<td>1-10</td>
</tr>
<tr>
<td>Diphenyl methane disocyanate</td>
<td>4,4’-Methylenedi phenyl diisocyanate</td>
<td>101-68-8</td>
<td>1-5</td>
</tr>
</tbody>
</table>

*Regulated ingredients only

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.
- Laundering enough contaminated clothing before reuse.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms (flare, irritate) occur.
- Remove contact lenses if worn.

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

D. Ingestion contact
- About whether I should induce vomiting Take the advice of a doctor.
- Rinse your mouth with water immediately.
- Get medical attention immediately.

C. Other hazards which do not result in classification : (NFPA Classification)
- Health : 2, Flammability : 1, Reactivity : 0
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.
- Remove to fresh air and keep at rest in a position comfortable for breathing.

5. FIREFIGHTING MEASURES

A. Suitable (Unsuitable) extinguishing media
- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

B. Specific hazards arising from the chemical
- Not available

C. Special protective actions for firefighters
- Cool containers with water until well after fire is out.
- Keep unauthorized personnel out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Notify your local firestation and inform the location of the fire and characteristics hazard.
- Keep containers cool with water spray.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures
- Ventilate closed spaces before entering.
- Move container to safe area from the leak area.
- Remove all sources of ignition.
- Handling the damaged containers or spilled material after wearing protective equipment.
- Avoid skin contact and inhalation.

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

C. Methods and materials for containment and cleaning up
- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notification to central government, local government. When emissions at least of the standard amount
- Dispose of waste in accordance with local regulation.
- Appropriate container for disposal of spilled material collected.

7. HANDLING AND STORAGE

A. Precautions for safe handling
- Avoid direct physical contact.
- Comply with all applicable laws and regulations for handling
- Do not handle until all safety precautions have been read and understood.
- Operators should wear antistatic footwear and clothing.

B. Conditions for safe storage, including any incompatibilities
- Check regularly for leaks.
- Do not use damaged containers.
- Do not apply direct heat.
- Save applicable laws and regulations.
- Collected them in sealed containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits
- ACGIH TLV
  - [1,1'-Methylenebis[4-isocyanatocyclohexane]] : TWA, 0.005 ppm (0.054 mg/m3)
  - [Diphenyl methane diisocyanate] : TWA, 0.005 ppm (0.051 mg/m3)
- OSHA PEL
- [Diphenyl methane diisocyanate]: (C) 0.02 (C) 0.2

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

### C. Individual protection measures, such as personal protective equipment
- **Respiratory protection**
  - Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
  - Respiratory protection is ranked in order from minimum to maximum.
  - Consider warning properties before use.
- **Eye protection**
  - Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
  - Provide an emergency eye wash station and quick drench shower in the immediate work area.
- **Hand protection**
  - Wear appropriate glove.
- **Skin protection**
  - Wear appropriate clothing.
- **Others**
  - Not available

### 9. PHYSICAL AND CHEMICAL PROPERTIES

| A. Appearance | B. Odor | C. Odor threshold | D. pH | E. Melting point/Freezing point | F. Initial Boiling Point/Boiling Ranges | G. Flash point | H. Evaporation rate | I. Flammability(solids, gas) | J. Upper/Lower Flammability or explosive limits | K. Vapour pressure | L. Solubility | M. Vapour density | N. Specific gravity(Relative density) | O. Partition coefficient of n-octanol/water | P. Autoignition temperature | Q. Decomposition temperature | R. Viscosity | S. Molecular weight |
|---------------|--------|-------------------|------|-------------------------------|----------------------------------------|---------------|--------------------|-----------------------------|------------------------------------------|----------------|--------------|----------------|-------------------|-----------------------------|----------------|-----------------|----------------|-----------------|------------------|
| - Appearance  | - Odor | - Odor threshold  | - pH | - Melting point/Freezing point | - Initial Boiling Point/Boiling Ranges | - Flash point | - Evaporation rate | - Flammability(solids, gas) | - Upper/Lower Flammability or explosive limits | - Vapour pressure | - Solubility | - Vapour density | - Specific gravity(Relative density) | - Partition coefficient of n-octanol/water | - Autoignition temperature | - Decomposition temperature | - Viscosity | - Molecular weight |
| Putty         | Mild   | Not available     | Not available | Not available | > 204.4 °C                     | > 233.8 °C    | Not available | Not available    | Not available           | <10mmHg@23°C    | Not available | 8.5MDI         | 1.1               | Not available                      | Not available | Not available | Not available | Not available | Not available |

### 10. STABILITY AND REACTIVITY

#### A. Chemical Stability
- This material is stable under recommended storage and handling conditions.

#### B. Possibility of hazardous reactions
- Hazardous Polymerization will not occur.

#### C. Conditions to avoid
- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces

#### D. Incompatible materials
- Not available

#### E. Hazardous decomposition products
- May emit flammable vapour if involved in fire.
II. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure

- (Respiratory tracts)
  - May cause allergy or asthma symptoms or breathing difficulties if inhaled
  - May cause respiratory irritation.

- (Oral)
  - Not available

- (Eye·Skin)
  - Causes serious eye irritation
  - Causes skin irritation
  - May cause an allergic skin reaction

- Acute toxicity
  * Oral - ATE MIX : >5000mg/kg
    - [1,1’-Methylenebis[4-isocyanatocyclohexane]]: LD50 9900 mg/kg Rat
    - [Isocyanic acid polymethylenepolyphenylene ester]: LD50 = 49000 mg/kg Rat
    - [1,1’-Methylenebis[isocyanatobenzene]]: LD50 > 2000 mg/kg Rat
    - [Diphenyl methane disiocyanate]: LD50 31600 mg/kg Rat
  * Dermal - ATE MIX : >5000mg/kg
    - [1,1’-Methylenebis[4-isocyanatocyclohexane]]: LD50 10000 mg/kg rabbit
    - [Isocyanic acid polymethylenepolyphenylene ester]: LD50 > 9500 mg/kg Rabbit
    - [1,1’-Methylenebis[isocyanatobenzene]]: LD50 > 6200 mg/kg Rat
  * Inhalation - ATE MIX : 0.05mg/L–0.5mg/L
    - [1,1’-Methylenebis[4-isocyanatocyclohexane]]: LC50 0.434 mg/L 4 hr (GLP) Rat
    - [Isocyanic acid polymethylenepolyphenylene ester]: Steam LC50 = 0.49 mg/L 4 hr Rat
    - [1,1’-Methylenebis[isocyanatobenzene]]: LC50 0.369 mg/L 4 hr Rat
    - [Diphenyl methane disiocyanate]: dust LC50 0.369 mg/L 4 hr Rat

- 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
    - [Isocyanic acid polymethylenepolyphenylene ester]: Group 3
    - [Diphenyl methane disiocyanate]: Group 3
  * OSHA
    - Not available
  * ACGIH
    - Not available
  * NTP
    - Not available
  * EU CLP
    - [Diphenyl methane disiocyanate]: Carc.2
    - [1,1’-Methylenebis[isocyanatobenzene]]: Carc.2

- Germ cell mutagenicity
  - Not available

- Reproductive toxicity
  - Not available

- STOT-single exposure
  - May cause respiratory irritation.

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

- Aspiration hazard
  - Not available

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

A. Ecotoxicity

- Fish
- [1,1’-Methylenebis(isocyanatobenzene)] : LC50 > 1000 µg/l 96 hr Brachydanio rerio
  - |Crustaceans|
  - [1,1’-Methylenebis(isocyanatobenzene)] : EC50 129.7 µg/l 24 hr Daphnia magna
  - |Algae|
  - | Persistence and degradability |
  - | Persistence |
  - | Degradability |
  - | Not available |
  - Not available
  - Not available

- [1,1’-Methylenebis(isocyanatobenzene)] : BCF 3 – 14
  - [1,1’-Methylenebis(4-isocyanatocyclohexane)] : ((28 days Aerobic, Activated Sludge))
  - [1,1’-Methylenebis(isocyanatobenzene)] : 0 (%) 28 day

- Not available

- Not available

- Not available

- Not available

13. DISPOSAL CONSIDERATIONS

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

B. Special precautions for disposal
  - The user of this product must dispose by oneself or entrust to waste disposer or person who other’s waste recycle and dispose, person who establish and operate waste disposal facilities.
  - Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

A. UN No. (IMDG)
  - Not available

B. Proper shipping name
  - Not available

C. Hazard Class
  - Not available

D. IMDG Packing group
  - Not available

E. Marine pollutant
  - Not available

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 : Not available
  - EmS SPILLAGE SCHEDULE : Not available

15. REGULATORY INFORMATION

A. National and/or international regulatory information
  - | POPs Management Law |
  - | Not applicable |
Information of EU Classification

* Classification
  - [1,1’-Methylenebis[4-isocyanatocyclohexane]]: T; R23 Xi; R36/37/38 R42/43
  - [1,1’-Methylenebis[isocyanatobenzene]]: Xi; R20 Xi; R36/37/38 R42/43
  - [Diphenyl methane diisocyanate]: Carc. Cat.; R40 Xi; R20-48/20 Xi; R36/37/38 R42/43

* Risk Phrases
  - [1,1’-Methylenebis[4-isocyanatocyclohexane]]: R23, R36/37/38, R42/43
  - [1,1’-Methylenebis[isocyanatobenzene]]: R20, R36/37/38, R42/43
  - [Diphenyl methane diisocyanate]: R20, R36/37/38, R40, R42/43, R48/20

* Safety Phrase
  - [1,1’-Methylenebis[4-isocyanatocyclohexane]]: S1/2, S26, S28, S38, S45
  - [1,1’-Methylenebis[isocyanatobenzene]]: S1/2, S23, S36/37, S45
  - [Diphenyl methane diisocyanate]: S1/2, S23, S36/37, S45

U.S. Federal regulations

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

* CERCLA Section 103 (40CFR302.4)
  - [Diphenyl methane diisocyanate]: 2267.995 kg 5000 lb

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

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

* EPCRA Section 313 (40CFR372.65)
  - [1,1’-Methylenebis[4-isocyanatocyclohexane]]: Applicable
  - [Isocyanic acid polymethylenepolyphenylene ester]: Applicable
  - [Diphenyl methane diisocyanate]: 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
   - This Safety Data Sheet was compiled with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS, IPCS

B. Issue date
   - 2016-02-04

C. Revision number and Last date revised
   - 1 times, 2016-02-04

D. Other
   - This SDS is prepared according to the Globally Harmonized System (GHS).
# SAFETY DATA SHEET

## Flexane 80P Hardener

**Date of issue:** 2016-02-04  
**Revision date:** 2016-02-04  
**Version:** R0002.0001

### 1. IDENTIFICATION

#### A. Product name

- Flexane 80P Hardener

#### B. Recommended use and restriction on use

- **General use**: Rubber repair  
- **Restriction on use**: Do not use except in prescribed application.

#### C. Manufacturer / Supplier / Distributor information

- **Company name** - ITW Polymers Adhesives, North America  
  **Address**: 30 Endicott Street, Danvers, MA 01933  
- **Company name** - ITW Performance Polymers Fluids Japan  
  **Address**: 30-32, Enoki-cho, Suita-city, Osaka, Japan, 564-0053  
  **Dept.** - Quality control  
  **Telephone number** - +81-6-6330-7118  
  **Fax number** - +81-6-6330-7118

### 2. HAZARD IDENTIFICATION

#### A. GHS Classification

- **Acute toxicity (oral)**: Category 4  
- **Serious eye damage/irritation**: Category 2A  
- **Specific target organ toxicity (Repeated exposure)**: Category 2

#### B. GHS label elements

- **Hazard symbols**
  - ![Hazard symbol]

- **Signal words**  
  - Warning

- **Hazard statements**  
  - H302 Harmful if swallowed  
  - H319 Causes serious eye irritation  
  - H373 May cause damage to organs through prolonged or repeated exposure (Refer Section SDS 11)

- **Precautionary statements**
  1) **Prevention**  
     - P260 Do not breathe dust/fume/gas/mist/vapours/spray.  
     - P264 Wash hands thoroughly after handling.  
     - P270 Do not eat, drink or smoke when using this product.  
     - P280 Wear protective gloves/protective clothing/eye protection/face protection.
  2) **Response**  
     - P301+P311 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.  
     - P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
     - P314 Get medical advice/attention if you feel unwell.  
     - P330 Rinse mouth.  
     - P337+P313 If eye irritation persists: Get medical advice/attention.
  3) **Storage**  
     - Not applicable
  4) **Disposal**  
     - P501 Dispose of contents/container in accordance with local/regional/national/international regulation

#### C. Other hazards which do not result in classification: (NFPA Classification)
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Trade names and Synonyms</th>
<th>CAS No.</th>
<th>Content(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxybispropanol dibenzoate</td>
<td>Oxydipropyl dibenzoate</td>
<td>27138-31-4</td>
<td>40-50</td>
</tr>
<tr>
<td>ar,ar-Diethyl-ar-methylbenzenediamine</td>
<td></td>
<td>-</td>
<td>40-50</td>
</tr>
<tr>
<td>Carbon black</td>
<td>Acetylene black</td>
<td>1333-86-4</td>
<td>40-50</td>
</tr>
<tr>
<td>Epoxidized soybean oil (ESBO)</td>
<td>Soybean oil, epoxidized</td>
<td>8013/7/8</td>
<td></td>
</tr>
</tbody>
</table>

*Regulated ingredients only

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.
- Laundering enough contaminated clothing before reuse.
- Get medical attention immediately.

C. Inhalation contact
- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.
- Get medical attention immediately.

D. Ingestion contact
- About whether I should induce vomiting. Take the advice of a doctor.
- Rinse your mouth with water immediately.
- Get medical attention immediately.

E. Delayed and immediate effects and also chronic effects from short and long term exposure
- Not available

F. Notes to physician
- Notify medical personnel of contaminated situations and have them take appropriate protective measures.

5. FIREFIGHTING MEASURES

A. Suitable (Unsuitable) extinguishing media
- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

B. Specific hazards arising from the chemical
- Not available

C. Special protective actions for firefighters
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Using an unattended and water devices in case of large fire and leave alone to burn if you do not imperative.
- Avoid inhalation of materials or combustion by-products.
- Do not access if the tank on fire.
- Use appropriate extinguishing measure suitable for surrounding fire.
- Keep containers cool with water spray.
- Vapor or gas is burned at distant ignition sources can be spread quickly.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures
- Must work against the wind, let the upwind people to evacuate.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Handling the damaged containers or spilled material after wearing protective equipment.
- Do not direct water at spill or source of leak.
- Avoid skin contact and inhalation.

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

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

7. HANDLING AND STORAGE

A. Precautions for safe handling
- Avoid direct physical contact.
- Since emptied containers retain product residue(vapor, liquid, solid) follow all MSDS and label warnings even after container is
- Comply with all applicable laws and regulations for handling
- Dealing only with a well-ventilated place.
- Do not inhale the steam prolonged or repeated.

B. Conditions for safe storage, including any incompatibilities
- Save applicable laws and regulations.
- Do not apply any physical shock to container.
- Avoid direct sunlight.
- Keep in the original container.
- Please pay attention to incompatibilities materials and conditions to avoid.
- Collected them in sealed containers.
- Do not eat, drink or smoke when using this product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits
- ACGIH TLV
  - [Carbon black] : TWA, 3 mg/m3, Inhalable particulate matter
- OSHA PEL
  - [Carbon black]: 3.5mg/m3

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

C. Individual protection measures, such as personal protective equipment
- Respiratory protection
  - Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
  - Respiratory protection is ranked in order from minimum to maximum.
  - Consider warning properties before use.
  - Any chemical cartridge respirator with organic vapor cartridge(s).
  - Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).
  - Any air-purifying respirator with a full facepiece and an organic vapor canister.
  - For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.
- Eye protection
  - Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
  - Provide an emergency eye wash station and quick drench shower in the immediate work area.
- Hand protection
  - Wear appropriate glove.
9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>A. Appearance</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Appearance</td>
<td>Liquid</td>
</tr>
<tr>
<td>- Color</td>
<td>Black</td>
</tr>
<tr>
<td>B. Odor</td>
<td>Mild ammonia like</td>
</tr>
<tr>
<td>C. Odor threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>D. pH</td>
<td>7월 8일</td>
</tr>
<tr>
<td>E. Melting point/Freezing point</td>
<td>Not available</td>
</tr>
<tr>
<td>F. Initial Boiling Point/Boiling Ranges</td>
<td>&gt; 232.2 ℃</td>
</tr>
<tr>
<td>G. Flash point</td>
<td>&gt; 135 ℃</td>
</tr>
<tr>
<td>H. Evaporation rate</td>
<td>&lt;&lt;1 (BuAc=1)</td>
</tr>
<tr>
<td>I. Flammability(solid, gas)</td>
<td>Not available</td>
</tr>
<tr>
<td>J. Upper/Lower Flammability or explosive limits</td>
<td>Not available</td>
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<tr>
<td>K. Vapour pressure</td>
<td>&lt;1mmHg@23 ℃</td>
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<tr>
<td>L. Solubility</td>
<td>Not available</td>
</tr>
<tr>
<td>M. Vapour density</td>
<td>&gt;1 (air=1)</td>
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<tr>
<td>N. Specific gravity (Relative density)</td>
<td>1.08</td>
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<tr>
<td>O. Partition coefficient of n-octanol/water</td>
<td>Not available</td>
</tr>
<tr>
<td>P. Autoignition temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Q. Decomposition temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>R. Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>S. Molecular weight</td>
<td>Not available</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

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

B. Possibility of hazardous reactions
- Hazardous Polymerization will not occur.

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

D. Incompatible materials
- Not available

E. Hazardous decomposition products
- May emit flammable vapour if involved in fire.

II. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure
- (Respiratory tracts)
  - Not available
- (Oral)
  - Harmful if swallowed
- (Eye·Skin)
  - Causes serious eye irritation

B. Delayed and immediate effects and also chronic effects from short and long term exposure
- Acute toxicity
  * Oral - ATE MIX: 300mg/kg~2000mg/kg
    - [Oxybispropanol dibenzoate]: LD50 4673 mg/kg Rat (Van Waters and Rogers)
    - [ar,ar-Diethyl-ar-methylbenzenediamine]: LD50 = 472 mg/kg Rat
    - [Carbon black]: LD50 = 15400 mg/kg Rat
    - [Epoxidized soybean oil (ESBO)]: LD50 = 21000 mg/kg Rat
* Dermal - ATE MIX : 2000mg/kg–5000mg/kg
  - [Carbon black] : LD50 = 3000 mg/kg; rabbit
  - [Epoxidized soybean oil (ESBO)] : LD50 > 2000 mg/kg; Rabbit

* Inhalation - ATE MIX : Not available
  - [Oxybispropanol dibenzoate] : (> 2000 mg/L, 4hr Rat - LC50 (Van Waters and Rogers))

○ Skin corrosion/irritation
  - Not available
○ Serious eye damage/irritation
  - Causes serious eye irritation
○ Respiratory sensitization
  - Not available
○ Skin sensitization
  - Not available
○ Carcinogenicity
  * IARC
    - [Carbon black] : Group 2B
  * OSHA
    - Not available
  * ACGIH
    - [Carbon black] : A3
  * NTP
    - Not available
  * EU CLP
    - Not available

○ Germ cell mutagenicity
  - Not available
○ Reproductive toxicity
  - Not available
○ STOT-single exposure
  - Not available
○ STOT-repeated exposure
  - May cause damage to organs through prolonged or repeated exposure (Refer Section SDS 11)
○ Aspiration hazard
  - Not available

12. ECOLOGICAL INFORMATION

A. Ecotoxicity

○ Fish
  - [Oxybispropanol dibenzoate] : LC50 5.114 mg/L 96 hr Other
  - [Epoxidized soybean oil (ESBO)] : LC50 = 900 mg/L 48 hr Leuciscus idus

○ Crustaceans
  - [Oxybispropanol dibenzoate] : LC50 5.239 mg/L 48 hr Other
  - [Carbon black] : EC50 = 5600 mg/L 24 hr
  - [Epoxidized soybean oil (ESBO)] : EC50 > 100 mg/L 24 hr Daphnia magna

○ Algae
  - [Oxybispropanol dibenzoate] : EC50 1.436 mg/L 96 hr Other
  - [Epoxidized soybean oil (ESBO)] : EC50 = 8 mg/L 72 hr Scenedesmus subspicatus

B. Persistence and degradability

○ Persistence
  - [Oxybispropanol dibenzoate] : log Kow = 3.88 (Estimates)
  - [ar,ar-Diethyl-ar-methylbenzenediamine] : log Kow = 2.23

○ Degradability
  - Not available

C. Bioaccumulative potential

○ Bioaccumulative potential
  - [Oxybispropanol dibenzoate] : BCF 192.5

○ Biodegradation
  - [Epoxidized soybean oil (ESBO)] : Biodegradability = 79 (%) 28 day

D. Mobility in soil
  - Not available
E. Other adverse effects
- Not available

13. DISPOSAL CONSIDERATIONS
A. Disposal methods
- Since more than two kinds of designed waste is mixed, it is difficult to treat separately, then can be reduction or stabilization by
incineration or similar process.
- If water separation is possible, pre-process with Water separation process.
- Dispose by incineration.

B. Special precautions for disposal
- The user of this product must dispose by oneself or entrust to waste disposer or person who other’s waste recycle and dispose,
person who establish and operate waste disposal facilities.
- Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION
A. UN No. (IMDG)
- Not available

B. Proper shipping name
- Not available

C. Hazard Class
- Not available

D. IMDG Packing group
- Not available

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 : Not available
- EmS SPILLAGE SCHEDULE : Not available

15. REGULATORY INFORMATION
A. National and/or international regulatory information
- POPs Management Law
  - Not applicable
- Information of EU Classification
  * Classification
    - [ar,ar-Diethyl-ar-methylbenzenediamine] : Xn; R21/22-48/22/Xi; R36/N; R50-53
  * Risk Phrases
    - [ar,ar-Diethyl-ar-methylbenzenediamine] : R21/22, R36, R48/22, R50/53
  * Safety Phrase
    - [ar,ar-Diethyl-ar-methylbenzenediamine] : S2, S26, S28, S36/37/39, S60, S61
- OSHA PROCESS SAFETY (29CFR1910.119)
  - Not applicable
- CERCLA Section 103 (40CFR302.4)
  - Not applicable
- EPCRA Section 302 (40CFR355.30)
  - Not applicable
- EPCRA Section 304 (40CFR355.40)
  - Not applicable
- EPCRA Section 313 (40CFR372.65)
  - Not applicable
- Rotterdam Convention listed ingredients
  - Not applicable
- Stockholm Convention listed ingredients
  - Not applicable
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.
- This Safety Data Sheet was compiled with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS,

B. Issue date
- 2016-02-04

C. Revision number and Last date revised
- 1 times, 2016-02-04

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