MATERIAL SAFETY DATA SHEET

KPX Chemical www.kpxchemical.com	KONIX PP-1000	MSDS No.	Page
		006- 041	1/11

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Identification of the substance or mixture : KONIX PP-1000

1.1.1. Product description : Polyether Polyol

1.2. Use of the substance/mixture : Use of the manufacture of polyurethane products.

1.3. Company/undertaking identification

1.3.1. Producer : - Company : KPX Chemical Co., Ltd.

- Address : 680-090, Yeocheon-Dong, Nam-Gu, Ulsan, Korea

- Telephone : 82-52-279-0200 **- Fax:** 82-52-268-6410

- E-mail address of responsible person : rd@kpxchemical.com

1.4. Emergency telephone : 82-52-279-0306 (Fax: 82-52-268-6410), 82-2-2014-4000 (Fax: 82-2-362-0034)

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance/mixture: Skin sensitization, Category 1

2.2. GHS label element, including precautionary statements

2.2.1. Pictogram :

2.2.2. Signal word : Warning

2.2.3. Hazard statement:

a) Physical Hazard: Not applicable

b) Health Hazard: May cause an allergic skin reaction.

c) Environmental Hazard : Not applicable

2.2.4. Precautionary statement

a) Prevention precautionary statements:

P261 : Avoid breathing dust / fume / gas / mist / vapors / spray.

P272 : Contaminated work clothing should not be allowed out of the workplace.

P280 : Wear protective gloves / protective clothing / eye protective / face protection.

b) Response precautionary statements:

P302 + P352 : IF ON SKIN : Wash with plenty of soap and water.

P333 + P313 : IF skin irritation or rash occurs : Get medical advice / attention.

P321 : Specific treatment may specify a cleansing agent if appropriate.

P363 : Wash contaminated clothing before use.

c) Storage precautionary statements: Not applicable

d) Disposal precautionary statements:

P501 : Dispose of contents / container to in accordance with local / regional / national / International regulation (to be specified).

2.3. Other Hazards which do not result in classification : Not classified as flammable but will burn.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Ingredients:

Substance name	CAS No.	Concentration (wt%)
Polyether Polyol	25322-69-4	100

• This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

4. FIRST AID MEASURES

4.1. Description of necessary first-aid measures.

4.1.1. Eye contact

- Immediately flush eyes with large amounts of water for at least 15 minutes while holding eyelids open.
- Transport to the nearest medical facility for additional treatment.

4.1.2. Skin contact

- Remove contaminated clothing.
- Flush exposed area with water and follow by washing with soap if available.

4.1.3. Inhalation

- Remove to fresh air.
- If rapid recovery does not occur, transport to nearest medical facility for additional treatment.

4.1.4. Ingestion

- Wash out mouth with water and obtain medical attention.

4.2. Most important symptoms/effects, acute and delayed : No specific adverse effects.

4.3. Indication of immediate medical attention and special treatment needed, if necessary.

- Treat symptomatically.
- Following cases of gross overexposure, investigation of liver, kidney and eye function may be advisable.
- Records of such incidents should be maintained for future reference.

5. FIRE-FIGHTING MEASURES

5.1. Suitable (and unsuitable) extinguishing media

5.1.1. Suitable extinguishing media

- Large fires should only be fought by properly trained fire fighters.
- Alcohol-resistant foam, water spray or fog.
- Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

5.1.2. Unsuitable extinguishing media

- Do not use water in a jet.

5.2. Special hazards arising from the chemical.

- Will only burn if enveloped in a pre-existing fire.
- Hazardous combustion products may include: Carbon dioxide. Carbon monoxide. Unidentified organic and inorganic compounds.

5.3. Special protective equipment and precautions for fire-fighters

- Wear full protective clothing and self-contained breathing apparatus.

5.4. Other information

- All storage areas should be provided with adequate fire fighting facilities.
- Keep adjacent containers cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures.

- Avoid contact with spilled or released material.
- For guidance on selection of personal protective equipment see Chapter 8 of his Material Safety Data Sheet.
- Avoid inhaling vapor and/or mists.
- Avoid contact with the skin.
- Extinguish any naked flames.
- Do not smoke.
- Remove ignition sources.
- Avoid sparks.

6.2. Environmental precautions.

- Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other

appropriate barriers.

- Use appropriate containment to avoid environmental contamination.
- Ventilate contaminated area thoroughly.

6.3. Methods and materials for containment and cleaning up

6.3.1. For large liquid spills (> 1 drum)

- Transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal.
- Do not flush away residues with water.
- Retain as contaminated waste.
- Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely.
- Remove contaminated soil and dispose of safely.

6.3.2. For small liquid spills (< 1 drum)

- Transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal.
- Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely.
- Remove contaminated soil and dispose of safely.

6.4. Other information

- Proper disposal should be evaluated based on regulatory status of this material (refer to Section 13), potential contamination from subsequent use and spillage, and regulations governing disposal in the local area.
- Observe all relevant local and international regulations.
- For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet.

7. HANDLING AND STORAGE

7.1. Precautions for safe Handling

- Avoid breathing vapors or contact with material.
- Only use in well ventilated areas.
- Wash thoroughly after handling.
- In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material.
- Use local exhaust extraction over processing area.
- Avoid unintentional contact with isocyanates to prevent uncontrolled polymerization. Avoid contact with skin, eyes, and clothing.
- Air dry contaminated clothing in a well-ventilated area before laundering.
- Extinguish any naked flames.
- Do not smoke. Remove ignition sources.

· Avoid sparks.
· Do not empty into drains.
· Handling Temperature: Ambient.
· When handling product in drums, safety footwear should be worn and proper handling equipment should be used.

7.2. Conditions for safe storage, including any incompatibilities.

· Prevent all contact with water and with moist atmosphere.
· Tanks must be clean, dry and rust-free.
· Prevent ingress of water.
· Must be stored in a well-ventilated area, away from sunlight, ignition sources and other sources of heat.
· Drums should be stacked to a maximum of 3 high.
· Maximum storage time : 12 months, storage temperature : ambient.
· Prevent Storage should be handled at temperatures such that viscosities are less than 500 cst : typically at 25~50℃.
· Nitrogen blanket recommended for large tanks.
· Tanks should be fitted with heating coils in areas where the ambient temperatures are below the recommended product handling temperatures.

7.3. Other information

· Ensure that all local regulations regarding handling and storage facilities are followed.
· Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
· Lines should be purged with nitrogen before and after transfer.
· Keep containers closed when not in use.
· Unsuitable materials : Copper, Copper alloys.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

8.1.1. Occupational Exposure limit : Workplace exposure limits for glycerol, propylene oxide, ethylene oxide and glycerol, propylene oxide, ethylene oxide polymer styrene, acrylonitrile polymer are not listed in EH40/2005 Workplace Exposure Limits.

8.1.2. Biological Exposure limit : No biological limit allocated.

8.2. Appropriate 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.

8.3. Individual protection measures, such as personal protective equipment(PPE)

8.3.1. Respiratory protection

· No respiratory protection is ordinarily required under normal conditions of use.

· In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material.

8.3.2. Hand protection

· Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739, AS/NZS:2161) made from the following materials may provide suitable chemical protection: Incidental contact/Splash protection: PVC. Neoprene rubber. Nitrile rubber. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity.

· Always seek advice from glove suppliers.

· Contaminated gloves should be replaced.

· Thin disposable gloves should be avoided for long term use.

· When worn, use once and dispose.

· Personal hygiene is a key element of effective hand care.

· Gloves must only be worn on clean hands.

· After using gloves, hands should be washed and dried thoroughly.

· Application of a non perfumed moisturizer is recommended.

8.3.3. Eye protection

· Chemical splash goggles (chemical mono-goggles) approved to EU Standard EN166, AS/NZS:1337.

8.3.4. Skin protection

· Wear appropriate chemical resistant clothing.

8.4. Monitoring methods

· Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls.

· For some substances biological monitoring may also be appropriate.

· Examples of sources of recommended air monitoring methods are given below or contact supplier.

· Further national methods may be available.

- Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances, http://www.hsl.gov.uk/search.htm.

- Berufsgenossenschaftliches Institut für Arbeitssicherheit (BIA), Germany http://www.hvbg.de/d/bia/index.html.

- L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/securite/hygiene_securite_travail.html.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless transparent liquid
Odor	slight
Odor threshold	No data available
pH	5.0 ~ 8.0
Melting point/freezing point	No data available
Initial boiling point/boiling range	No data available
Flash point	235 ℃ (C.O.C method)
Evaporation rate	No data available
Flammability (solid, gas)	Not applicable
Flammable limits in air	Not applicable
Explosive properties	Not applicable
Oxidizing properties	Not applicable
Vapor pressure	Negligible at ambient temperature
Solubility	Slightly soluble (in water)
Vapor density	Not applicable
Relative density	1.010 ~ 1.020 (at 25 ℃)
Partition coefficient: n-octanol/water	Log Pow:3.478
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	130 ~ 170 (cps at 25 ℃)
Molecular weight	1000 approximately

10. STABILITY AND REACTIVITY

10.1. Reactivity : No data available

10.2. Chemical stability: In a usual handling condition, chemically stable against light, heat, and the impact.

10.3. Possibility of hazardous reactions: No data available

10.4. Conditions to avoid: Heat, flames, and sparks.

10.5. Incompatible Materials : Avoid contact with isocyanates, copper and copper alloys, zinc, strong

oxidizing agents, and water.

10.6. Hazardous decomposition products: Unknown toxic products may be formed.

10.7. Other information

- Hygroscopic.
- Polymerizes exothermically with isocyanates at ambient temperatures.
- The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of reaction partners is good or is supported by stirring or by the presence of solvents.
- Reacts with strong oxidizing agents.
- Hazardous Polymerization: No

11. TOXICOLOGICAL INFORMATION

11.1. Likely routes of exposure

- Exposure may occur via inhalation, ingestion, skin absorption, skin or eye contact, and accidental ingestion.

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

11.2.1. Acute Oral Toxicity : LD50 >2000 mg/kg(Rat)

11.2.2. Acute Dermal Toxicity : LD50 >2000 mg/kg(Rat)

11.2.3. Acute Inhalation Toxicity(Gas) : Classification not possible (Because this item was a liquid).

11.2.4. Acute Inhalation Toxicity(Vapor) : Classification not possible(No data available).

11.2.5. Acute Inhalation Toxicity(Dust/mist) : Classification not possible(No data available).

11.2.6. Skin Corrosion / Irritation: Classification not possible(Not irritating to skin).

11.2.7. Serious eye damage / irritation : Classification not possible
(May cause eye irritant but no data available)

11.2.8. Respiratory Sensitization: Classification not possible(No data available).

11.2.9. Skin Sensitization: May cause an allergic skin reaction.

11.2.10. Germ cell mutagenicity : Classification not possible(No evidence of mutagenic activity).

11.2.11. Carcinogenicity : Classification not possible(Not expected to be carcinogenic).

11.2.12. Reproductive Toxicity : Classification not possible(No data available).

11.2.13. Specific target organ toxicity-single exposure : Classification not possible(No data available).

11.2.14. Specific target organ toxicity-repeated exposure : Classification not possible(No data available).

11.2.15. Aspiration hazard : Classification not possible(No data available).

11.3. Signs and symptoms of Exposure : To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

11.4. Other information: Not available.

Source: U.S. EPA ECOTOX, Version 4 - http://cfpub.epa.gov/ecotox/quick_query.htm

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity: Incomplete ecotoxicological data are available for this product

12.1.1. Acute Toxicity:

- **Fish** : Expected to have low toxicity: LC/EC/IC50 > 10000 mg/l
- **Aquatic Invertebrates** : Expected to have low toxicity: LC/EC/IC50 > 100 mg/l
- **Algae** : Expected to have low toxicity: LC/EC/IC50 > 1000 mg/l
- **Microorganisms** : Expected to have low toxicity: LC/EC/IC50 > 100 mg/l

12.2. Persistence and degradability: Expected to be not inherently biodegradable.

12.3. Bioaccumulative potential: Does not bioaccumulate significantly.

12.4. Mobility in soil.

- If product enters soil, it will be highly mobile and may contaminate groundwater.
- Sinks in fresh water; may float or sink in seawater.

12.5. Results of PBT assessment: Not available.

12.6. Other adverse effects: Small particles may have physical effects on aquatic and terrestrial organisms.

13. DISPOSAL CONSIDERATIONS

13.1. Material Disposal

- Dispose off in accordance with local and national regulations.
- Dispose off and store in a sealed container.
- Recover or recycle if possible.
- Do not dispose into the environment, in drains or in water courses.
- Waste product should not be allowed to contaminate soil or water.

13.2. Container Disposal

- The container is recycled after cleaned, or is disposed appropriately according to the standard of related regulations and the local government.
- Drain container thoroughly
- After draining, vent in a safe place away from sparks and fire.
- Send to drum recoverer or metal reclaimer.

13.3. Waste type: Waste Code No. in accordance with Council Directive 75/422/EEC.

14. TRANSPORT INFORMATION

14.1. UN Number : Not Applicable.

14.2. UN Proper Shipping Name : Not Applicable.

14.3. Transport Hazard class(es) : Not Applicable.

14.4. Packing group : Not Applicable.

14.5. Environmental hazards.

14.5.1. Land transport

· Transport in accordance with your country and regions regulations(RID,ADR,DOT etc.).

14.5.2. Sea transport

· This material is not classified as dangerous under IMDG regulations.

14.5.3. Air transport

· This material is not classified as dangerous under IATA regulations.

14.6. Transport in bulk according to AnnexⅡof MARPOL 73/78 and the IBC Code.

14.7. Special precautions for user : No data available

14.8. Other information: No data available.

15. REGULATORY INFORMATION

15.1. Chemical Safety Assessment: No data available.

15.2. Provisions in relation to protection of man or the environment at Community level (e.g. authorizations given under Title VII or restrictions under Title VIII): Not applicable for the substances.

15.3. National laws which implement these provisions and any other national measures that may be relevant:

United States Federal Regulations

· OSHA Hazcom Standard Rating: Non-Hazardous

· US. Toxic Substances Control Act: Listed on the TSCA Inventory.

· US. EPA CERCLA Hazardous Substances (40 CFR 302): Components-None

· SARA Section 311/312 Hazard Categories: Non-hazardous under Section 311/312

· US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A): Components-None

· US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required: Components –None

· US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261)

: Under RCRA, it is the responsibility of the person who generates a solid waste, as defined in 40 CFR 261.2, to determine if that waste is a hazardous waste.

State Right-To-Know Information

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

EC Regulations

· Corrigendum to Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (OJ L 396, 30.12.2006);

· Corrigendum to Directive No 2006/121/EC of the European Parliament and of the Council of 18 December 2006 amending Council Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labeling of dangerous substances in order to adapt it to Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency (OJ L 396, 30.12.2006);

· Regulation (EC) No 1272/2008 of the European parliament and of the Council of 16 December 2008 on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (OJ L 353, 31.12. 2008).

16. OTHER INFORMATION

16.1. Instructions for the training: Product handling instruction shall be included into the educational system about the safety work (initial training, training at the workplace, repeated training) according to specific conditions at the workplace.

16.2. Recommended restrictions on use (i.e. non-statutory recommendations by supplier)

· Substance should not be used for any other purpose than for which is appointed (point 1.2). Because of the fact that specific conditions of use of substance are out of supplier's control, it is responsibility of the user to adjust the prescribed warnings to local laws and regulations.

• Safety information describes the product in terms of safety and it cannot be considered as technical information about product.

16.3. Purpose of SDS: Purpose of this SDS is to provide relevant information for users of **KONIX PP-1000** to ensure proper handling and control of risks/hazards.

16.4. Date of draft: Jun.1. 1996

16.5. Number of revision and date of final revision: 3 / Sep. 18. 2012