MSDS

MATERIAL SAFETY DATA SHEET

MSDS# 26-003

Date: Jan. 1, 2006

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **MELCROSS™ 26 Resin**

SYNONYMS : Butylated melamine formaldehyde resin

CHEMICAL FAMILY : Alkylated melamine-formaldehyde resin

MOLECULAR FORMULA : MIXTURE

MOLECULAR WEIGHT : MIXTURE

TIC, Ulsan College, Muger2-dong, Nam-gu, Ulsan, 680-808, KOREA

MSDS REQUEST : +82-52-223-2104

CUSTOMER SERVICE : +82-52-22

COMPANY : **P&ID Co. Ltd.** 3-2104

EMERGENCY TELEPHONE NUMBER

DOMESTIC : +82-52-223-2102

INTERNATIONAL : +82-52-223-2108

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS. NO.	CONTENT(%)	TWA/CEILING	REFERENCE
Formaldehyde	50-00-0	1.0 max	0.75 ppm	OSHA
			2 ppm STEL	OSHA
			0.3 ppm (ceiling)	ACGIH
Butanol	71-36-3	28.0 max	100 ppm	OSHA
			50 ppm(ceiling)	ACGIH
Xylene	1330-20-7	14.0 max	100 ppm	OSHA
			150 ppm(STEL)	ACGIH
Ethylbenzene	100-41-4	5.0 max	100 ppm	OSHA
			125 ppm(STEL)	ACGIH

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR : Low viscous liquid, colorless, butanol and xylene odors

STATEMENTS OF HAZARD : Caution! May Cause Eye Irritation

CHRONIC HAZARD WARNING :

Potential cancer hazard – contains formaldehyde

Inhalation of formaldehyde vapor

Caused cancer in laboratory animal tests

Risk of cancer depends on duration and level of exposure.

POTENTIAL HEALTH EFFECTS

EFFECTS OF OVEREXPOSURE :

Item	Value
acute oral (rat), LD_{50}	>1,200mg/kg
acute dermal (rabbit), LD_{50}	>1,900mg/kg
4-hour inhalation (rat) LC_{50}	>7mg/L

Direct contact with this material may cause mild eye irritation.

Overexposure to vapors may cause respiratory tract irritation and central nervous system depression.

4. FIRST AID MEASURES

Material is not expected to be harmful by ingestion. No specific first aid measures are required.

In case of skin contact, wash affected areas of skin with soap and water.

In case of eye contact, immediately irrigate with plenty of water for 15 minutes.

If vapor or dust of this material is inhaled, remove from exposure. Administer oxygen of there is difficulty in breathing. Obtain medical attention immediately if necessary.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT : 28℃

METHOD : Setaflash Closed Cup

FLAMMABLE LIMITS(% BY VOL) : Not available

AUTOIGNITION TEMP: Not available

DECOMPOSITION TEMP: Not available

EXTINGUSHING MEDIA AND FIRE FIGHTING INSTRUCTIONS

Use water spray, carbon dioxide or dry chemical to extinguish fires. Use water to keep containers cool. Wear self-contained, positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Where exposure level is not known, wear NIOSH approved, positive pressure, self-contained respirator. Where exposure level is known, wear NIOSH approved, respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section 8 (Exposure Controls/Personal Protection), wear impervious boots. Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush area with water.

7. HANDLING AND STORAGE

Handling

Keep away from heat and flame. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Storage

Areas containing this material should have fire safe practices and electric equipment in accordance with applicable regulations and/or guidelines. Standards are primarily based on the material's flashpoint, but mat also take into account properties such as miscibility with water or toxicity.

Storage temperature : 4.4~32.2℃

Reason : Integrity

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

Engineering controls are not usually necessary if good hygiene practices are followed. Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water. Avoid unnecessary skin contact. Impervious gloves and apron are recommended to prevent skin contact. For operations where eye or face contact can occur, wear eye protection such as chemical

splash-proof goggles or face shield. Where exposures are below the Permissible Exposure Limit(PEL), no respiratory protection is required. Where exposures exceed the PEL, use respirator approved by NIOSH for the material and level of exposure.

It is recommended that a shower be taken after completion of workshift especially if significant contact has occurred. Work clothing should then be laundered prior to reuse. Street clothing should be stored separately from work clothing and protective equipment. Work clothing and shoes should not be taken home.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR : Viscous liquid, colorless, butanol and xylene odors.

BOILING POINT : 118℃(for butanol)

MELTING POINT : Not applicable

VAPOR PRESSURE : 5mmHg/20℃(for butanol)

SPECIFIC GRAVITY : 0.96~1.00g/cm^3

VAPOR DENSITY : 2.55(air=1)

%VOLATILE(BY WT) : 48~52

pH : Not applicable

SATURATION IN AIR(%BY VOL) : Not available

EVAPORATION RATE : 0.43(for butanol)

SOLUBILITY IN WATER : Insoluble

VOLATILE ORGANIC CONTENT : Not available

10. STABILITY AND REACTIVITY

STABILITY : Stable

CONDITIONS TO AVOID : None known

POLYMERIZATION : Will Not Occur

CONDITIONS TO AVOID : None known

INCOMPATIBLE MATERIALS : No specific incompatibility

HAZARDOUS DECOMPOSITION PRODUCTS : oxides of carbon; oxides of nitrogen

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3.HAZARDS IDENTIFICATION.

Toxicological information on the OSHA regulated components of this product is as follows:

Formaldehyde has oral(rat) and dermal(rabbit) LD50 values of 100mg/kg and 270 mg/kg, respectively. The LC50 following a 4-hour inhalation exposure to rats is 250-478 ppm. Irritation of the nose and throat has been observed in people exposed to formaldehyde vapor levels in excess of 1 ppm. Normal breathing may be seriously impaired at levels above 10 ppm and serious lung damage can occur at levels exceeding 50 ppm. Formaldehyde has been reported to cause pulmonary hypersensitivity in some individuals who were exposed to concentrations known to cause irritation: however, no pulmonary sensitization has been demonstrated in laboratory animal studies. Formaldehyde solutions can cause severe eye and moderate skin irritation. Repeated skin exposure to solutions of 2% or more formaldehyde has caused allergic skin reactions. Formaldehyde was found to be weakly mutagenic in a number of in vitro genotoxicity tests and positive in certain in vivo screening tests for mutagenicity. Formaldehyde did not cause birth defects in rats inhaling concentrations up to 10 ppm. However, a study using higher levels did show a slight but statistically significant reduction in male fetal body weight. Lifetime inhalation of formaldehyde vapor at concentrations above 5 ppm for 6 hours per day, caused nasal tumors in laboratory animals. Epidemiology studies have failed to link cancer in humans with occupational exposure to formaldehyde. Inhalation caused liver and kidney damage in laboratory animal tests.

Butanol has acute oral(rat) and dermal(rabbit) LD50 values of 0.790g/kg and 3.4g/kg, respectively. The LC50(rat) following a 4-hour inhalation exposure is >8000 ppm(24.24mg/L). Acute overexposure to isobutanol vapor can cause irritation to the eyes(severe), skin(moderate), and mucous membranes, as well as, central nervous system depression. Direct contact with isobutanol may cause severe eye and mild to moderate skin irritation.

Xylene has an acute oral(rat) of 4.3 to 5g/kg and an acute 4-hour LC50(rat) of 19.7 to 29.1mg/L. Inhalation of vapors may be irritating to the nose and throat. Skin contact results in moderate irritation and loss of natural oils. Vapors cause eye irritation.

Ethylbenzene has acute oral(rat) and dermal(rabbit) LD50 values of 3500mg/kg and 5000mg/kg

respectively. The 4-hour inhalation LC50 in rat is 4000 ppm(17.36mg/L). It is a mild eye and skin irritant. Prolonged exposure to the vapor of ethylbenzene may cause irritation of the eyes and upper respiratory tract, motor ataxia, and hematological disorders and hepatobiliary complaints.

12. ECOLOGICAL INFORMATION

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

The ecological assessment for this material is based on an evaluation of its components.

Degradation Test : Biodegradability

Duration : 28 day, <70%

13. DISPOSAL CONSIDERATIONS

The information on waste classification and disposal methodology provided below applies only to the P&ID product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life, the guidance may be inapplicable. To determine lgnitability, see Section 5 of this MSDS (flash point). For Corrosivity, see Sections 9 and 14 (pH and DOT corrosivity). For Reactivity, see Section 10 (incompatible materials). For Toxicity, see Section 2 (composition). P&ID encourages the recycle recovery and reuse of materials, where permitted, as an alternate to disposal as a waste. P&ID has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

D.O.T. SHIPPING INFORMATION

SHIPPING NAME : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S

HAZARD CLASS/PACKING GROUP : 3 / III

UN NUMBER : UN1866

D.O.T HAZARDOUS SUBSTANCES : (PRODUCT REPORTABLE QUANTITY)

Formaldehyde(3333 Ibs.)

Butanol(16129 lbs.)

Xylene(909 lbs.)

TRANSPORT LABEL REQUIRED : Flammable Liquid

ICAO/IATA

SHIPPING NAME : Resin solution

HAZARD CLASS : 3

SUBSIDIARY CLASS : NOT Applicable

UN/ID NUMBER : 1866

PACKING GROUP : III

TRANSPORT LABLE REQUIRED : Flammable Liquid

PACKING INSTR/ MAX NET QTY : PASSENGER Aircraft: 309; 60L

CARGO Aircraft: 310; 220L

ADDITIONAL TRANSPORT INFORMATION

TECHNICAL NAME (N.O.S.) : (Contains formaldehyde)

COMMENTS : DOT – Not regulated if less than Reportable Quantity (RQ) per package.

15. REGULATORY INFORMATION

INVENTORY INFORMATION

USA :

All components of this product are included on the TSCA Inventory in compliance with the Toxic Substances Control Act, 15 U. S. C. 2601 et. Seq.

EU :

The following components of this product are included in the European Inventory of Existing Chemical Substances(EINECS) or are polymers of which the components of which are in EINECS, in compliance with Council Directive 67/548/EEC and its amendments.

CHINA :

All components of this product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.

JAPAN :

All components of this product are included on the Japan(ENCS) inventory or are not required

to be listed on the Chinese inventory.

KOREA :

All components of this product are included on the Korea(ECL) inventory or are not required to be listed on the Chinese inventory.

16. OTHER INFORMATION

NFPA Rating:

Health : 3- Materials that, under emergency conditions, can cause serious or permanent injury.

Fire : 3- Liquid and solids that can be ignited under almost all ambient temperature conditions.

Reactivity : 0- Materials that in themselves are normally stable, even under fire exposure conditions.

MSDS Version Number : 3

MSDS Effective Date : Jan. 1, 2006

Uses and Restrictions : Use only in industrial manufacturing processes.

MSDS Distribution :

The information in this document should be made available to all who may handle the product.