MATERIAL SAFETY DATA SHEET
GLYCERIN MSDS

Section 1 : Chemical Product and Company Identification

Product name : Glycerin
Catalog codes : SLG 1171, SLG1894, SLG1111, SLG1615
CAS#: 56-81-5
RTECS: MA8050000
TSCA 8 (b) inventory: Glycerin
CI#: Not Available
Synonim: 1,2,3 – Propanetriol; Glycerol
Chemical Name : Glycerin
Chemical Formula: C3H5 (OH)3

Contact Information :
PT.DUA KUDA INDONESIA
JL. MADIUN BLOK C2.11-C2.13
UNIT USAHA KAWASAN MARUNDA
JAKARTA-UTARA 14120
PHONE : +62-21-44852388

Section 2: Composition and Information on Ingredients

Composition :

Name	CAS #	%by Weight
Glycerin	56-81-5	100

Toxocological Data on Ingredients : Glycerin: ORAL (LD50): Acute: 12600mg/kg (Rat). 4090 mg/kg (Mouse). DERMAL (LD50): Acute: 10000 mg/kg (Rabbit). MIST (LC50): Acute: > 570 mg/m a hours (Rat)

Section 3 : Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant,permeator), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS:Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4 : First Aid Measures

Eye Contact :
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention if irritation occurs.

Skin Contact :
Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.
Serious Skin Contact : Not available

Inhalation :
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Serious Inhalation: Not available.

Ingestion:
Do not induce vomiting unlessdirected to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately .

Serious inhalation: Not available

Ingestion :
Do not induce vomiting unless directed to do so by medical personnel. Never give anything bu mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion : Not available.

Section 5 : Fire and Explosion Data

Flammability of the Product : May be combustible at high temperature

Auto-Ignition Temperature :
370^{o}C (698^{o}F)(NFPA Fire Protection Guide to Hazardous Materials, 13th ed., 2002; NIOSH ICSC, 2001; CHRIS,2001)392 C (739 F) (Lewis, 1997)

Flash Points:
CLOSED CUP: 160^{o}C (320^{o}F).(Chemical Hazard Response Information System,2001;Lewis,1997). OPEN CU: 177^{o}C (350.6^{o}F)(Budavari,2000; Chemical Response Information System,2001; niosh icsc,2001) OPEN CUP: 199^{o}C (390F) (National Fire Protection Association,Fire Protection Association,Fire Protection Guide to HazardousMaterials,13 ed., 2002)

Flammable Limits : LOWER: 0.9%

Products of Combustion: These products are products are carbon oxides (CO,CO2), irritating and toxic fumes.

Fire Hazards in Presence of Various Substances:
Slightly flammable to flammable in presence of open flames and sparks, of heat, of oxidizing materials. Non-flammable in presence of shocks.

Explosion Hazards in presence of various substances:
Risk of explosion of the product in presence of mechanical impact: Not available. Risk of explosion of the product in presence of static discharge: Not available. Explosive in precense of oxidizing materials.

Fire Fighting Media and Instructions :
SMALL FIRE: Use Dry chemical powder. LARGE FIRE: use water spray, fog or foam. Do not use water jet.

Special Remarks on fire Hazards: Not available.

Special Remarks on Explosion Hazards:
Glycerin is incompatible with strong oxidizers such as chromium trioxide, potassium chlorate, or potassium permanganate and may explode on contact with these compounds. Explosive glyceryl nitrate is formed from a mixture of glycerin and nitric and sulfuric acids. Perchloric acid, lead oxide + glycerin form perchloric esters which may be explosive. Glycerin and chlorine may explode if heated and confined.

Section 6 : Accidential Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Stop leak if without risk. If the product is in its solid form: use a hovel to put the material into a convenient waste disposal container. If the product is in its liquid form: do not get water inside container.Absorb with an inert material and put the spilled material in an appropriate waste disposal. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basement or confined areas;dike if needed. Elimination all ignition sources. Call for assistance on disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concertration level above TLV.Check TLV on the MSDS and with local authorities.

Section 7: Handling and storage

Precautions :
Keep away from heat. Keep away from sources of ignition.Ground all equipment containing material. Do not ingest.Do not breathe gas/fumes/vapor/spray. Wear suitable protective clothing. If ingested,seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage:
Keep container tightly closed. Keep container in a cool, well-ventilated area. Hygroscopic

Section 8: Exposure Controls/ Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in case of a Large Spill:
Splash goggles.full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 10 (mg/m3) from ACGIH (TLV) (United States) (1999) Inhalation Total. TWA: 10 STEL:20 (mg/m3)(Canada) TWA:10 STEL:20 (mg/m3) (Canada)TWA: 5 (mg/m3) from OSHA (PEL) (United States) Inhalation Respirable. Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance : Liquid (viscous (Syrupy)liquid)

Odor: Mild

Taste: Sweet

Molecular Weight: 92.09 g/mole

Color : Clear Colorless

PH (1% soln/water): Not available

Boiling Point: 290^{o}C (554^{o}F)

Melting Point: 19^{o}C (66.2^{o}F)

Critical Temperature: Not available

Specific Gravity : 1.2636 (water = 1)

Vapor Pressure: 0 kPa (@20^{o}C)

Vapor Density: 3.17 (Air=1)

Volatility : Not available

Water/Oil DistCoeff: The product is more soluble in water; log (oil/water)=-1.8

Ionicity (in water): Not available

Dispersion Properties: See solubility in water, acetone

Solubility:
Miscible in cold water, hot water and alcohol.Partially soluble in acetone. Very slightly soluble in diethyl ether (ethyl ether). Limited solubility in ethyl acetate. Insoluble in carbon tetrachloride,benzene,chloroform,petroleum ethers ,and oils.

Section 10: Stability and Reactivity Data

Stability : The product is stable

Instability Temperature : Not Available

Conditions of Instability : avoid contact with incompatible materials, excess heat and ignition, sources, moisture.

Incompatibility with various substances: Highly reactive with oxidizing agents

Corrosivity : non-corrosive in presence of glass

Special Remarks on Reactivity:
Hygroscopic. Glycerin is incompatible with strong oxiders such as chromium trioxide, potassium chlorate, or potassium permanganate. Glycerin may react violently with acetic anhydride, aniline and nitrobenzene, chromic oxide, lead oxide and fluorine, phosphorous triodide, ethylene oxide and heat, silver prechlorate, sodium peroxide, sodium hydride.

Special Remarks on Corrosivity : Not available

Polumerization: will not occur

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LC50): 4090 mg/kg (Mouse). Acute dermal toxicity of the mist (LC50): > 570 mg/m3 1 hours (Rat).

Chronic Effects on Humans: May cause damage to the following organs: kidneys

Other Toxic Effects on Humans : Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals :
TDL (rat) –Route: Oral;dose: 100 mg/kg 1 day prior to mating. TDL (human) – Route: Oral; Dose: 1428 mg/kg

Special Remarks on other Toxic Effects on Humans:
Acute Potensial Health Effects: Low hazards for normal industrial or normal workplace conditions. Skin: May cause skin irritation. May be absorbed through skin eyes: may cause eye irritation with stinging redness, burning sensation, and tearing, but no eye injury. Ingestion: low hazards. Low toxicity except with very large doses. When large doses are ingested , it can cause gastrointestinal tract irritation with thirst (dehydration),nausea or vomiting diarrhea. It may also affect behavior/central nervous system/nervious system (central nervous system depression, general anesthetic, headache,dizziness, confusion, insomnia, toxic psychosis, muscle weakness, paralysisconvulsions), urinary system/kidneys (renal failure,hemoglobinuria),

Cardiovascular system (cardiac arrhythmias), liver. It may also cause elevated
Inhalation: due to low vapor pressure, inhalation of the vapors at room temperatu
Inhalationof mist may cause respiratory tract irritation. Chronic potential health effects: ingestion: prolonged or repeated ingestion may affect the blood (hemolysis, changes in white blood cell count), endocrine system (Change in adneral weight), respiratory system, and may cause kidney injury.

Section 12 : Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 58.5 ppm 96 hours (Trout)

BOD5 and COD : Not Available

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. How ever, long term degradation products may arise.

Toxicity of the products of Biodegradation: The products of degradation products are less toxic than the product itself.

Special Remarks on the products of Biodegration: not available

Section 13: Disposal Consierations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification : Not applicable

Special Provisions for Transport: Not applicable

Section 15: Other Regulatory Information

Federal and state Regulations :
Ilinois toxic substances disclosure to employee act : Glycerin Rhode Islan RTK hazardous substances: Glycerin Pennsylvania RTK: Glycerin Minnesota: Glycerin Massachusetts RTK: Glycerin Tenessee-Hazardous Right to know: Glycerin TSCA 8(B) Inventory: Glycerin.

Other Regulations:
OSHA: Hazardous by definition of hazards communication stacdard (29 CFR 1910.1200). EINECS: This product is on the European inventory of existing Commercial Chemical Substances.

Other Classifications :

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC) : Not available S24/25- Avoid contact with skin and eyes.

HMIS (U.S.A):
Health Hazards: 1
Fire Hazards: 1
Reactivity : 0
Personal Protection: g

National Fire Protection Association (U.S.A):
Health : 1
Flammability : 1
Reactivity: 0
Specific hazards:

Protective Equipment :
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/ certified respirator or equipvalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.