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

Material Name	:	**MPG Industrial TG**
Product Code	:	U1517
Recommended use / Restrictions of use	:	Generally accepted for use as a component in the manufacture of unsaturated polyester resins, functional fluids, paints and coatings and plasticizers. / Please refer to Chapter 16.
Supplier	:	SHELL EASTERN CHEMICALS (S) A REGISTERED BUSINESS OF SHELL EASTERN TRADING (PTE) LTD (UEN:198902087C) The Metropolis Tower 1 9 North Buona Vista Drive , #07-01 Singapore 138588 Singapore
Telephone	:	+65 6384 8737
Fax	:	+65 6384 8454
Emergency Telephone Number	:	+800-253-78-747 (Alert SGS)

2. HAZARDS IDENTIFICATION

GHS Classification : Not classified

GHS Label Elements

Symbol(s) :
No symbol

Signal Words : No signal word

GHS Hazard statements : PHYSICAL HAZARDS:
Not classified as a physical hazard under GHS criteria.
HEALTH HAZARDS:
Not classified as a health hazard under GHS criteria.
ENVIRONMENTAL HAZARDS:
Not classified as an environmental hazard under GHS criteria.

GHS Precautionary Statements

Prevention : No precautionary phrases.

Response : No precautionary phrases.

Storage : No precautionary phrases.

Disposal: : No precautionary phrases.

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Identity : Propane-1,2-diol
CAS No. : 57-55-6

Classification of components according to GHS

Chemical Name	Synonyms	CAS	Hazard Class (category)	Hazard statement	Conc.
Monopropylene glycol		57-55-6	None, None;	None;	100.00 %W

4. FIRST-AID MEASURES

General Information : Not expected to be a health hazard when used under normal conditions.

The first aid measures for different exposure routes:

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

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

Eye Contact : Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

Ingestion : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.

Notes to physician

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

Immediate medical attention, special treatment : Treat symptomatically. Following cases of gross over-exposure, investigation of liver, kidney and eye function may be advisable. Records of such incidents should be maintained for future reference.

5. FIRE-FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Specific Hazards : Clear fire area of all non-emergency personnel. The vapour is

heavier than air, spreads along the ground and distant ignition is possible. Will only burn if enveloped in a pre-existing fire. Hazardous combustion products may include: Carbon monoxide.

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.
Unsuitable Extinguishing Media	:	Do not use water in a jet.
Protective Equipment for Firefighters	:	Wear full protective clothing and self-contained breathing apparatus.
Other Advice	:	All storage areas should be provided with adequate fire fighting facilities. Keep adjacent containers cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

Observe all relevant local and international regulations.

Personal Precautions, Protective Equipment and Emergency Procedures	:	Avoid inhaling vapour and/or mists. Avoid contact with the skin. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.
Environmental Precautions	:	Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Ventilate contaminated area thoroughly.
Methods and Material for Containment and Cleaning Up	:	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. For small liquid spills (< 1 drum), transfer by mechanical means to a labelled, 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.
Additional Advice	:	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 regulations. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. For guidance on disposal of spilled material see Chapter 13 of this Material Safety Data Sheet.

7. HANDLING AND STORAGE

General Precautions	:	Avoid breathing vapours or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. On guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. 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.
Precautions for Safe Handling	:	In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. Use local exhaust extraction over processing area. For lines and fittings, avoid copper, copper alloys, zinc. 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. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Must be stored in a diked (bunded) area.
Conditions for Safe Storage	:	Prevent all contact with water and with moist atmosphere. Tanks must be clean, dry and rust-free. Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat. Nitrogen blanket recommended for large tanks (capacity 100 m3 or higher). Drums should be stacked to a maximum of 3 high. Keep container tightly closed. Keep dry. Must be stored in a well-ventilated area, away from sunlight, ignition sources and other sources of heat. Prevent ingress of water. Storage Temperature : 40°C maximum. Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.
Product Transfer	:	Lines should be purged with nitrogen before and after product transfer. Keep containers closed when not in use.
Recommended Materials	:	Stainless steel. Aluminum Non-transparent plastic
Unsuitable Materials	:	Data not available.
Container Advice	:	Keep containers closed when not in use. Must be stored in a well-ventilated area, away from sunlight, ignition sources and other sources of heat.
Other Advice	:	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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

If the American Conference of Governmental Industrial Hygienists (ACGIH) value is provided on this document, it is provided for information only.

Occupational Exposure Limits

None established.

Additional Information : Wash hands before eating, drinking, smoking and using the toilet.

Biological Exposure Index (BEI)

Biological Limit Values (BLV) have not been established for this material.

Appropriate Engineering Controls : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: No exposure controls are ordinarily required under normal conditions of use. It is good general industrial hygiene practice to minimize exposure to the material. Eye washes and showers for emergency use. Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping. Define procedures for safe handling and maintenance of controls. Educate and train workers in the hazards and control measures relevant to normal activities associated with this product. Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation. Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle

Individual Protection Measures : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

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.

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. Thin disposable gloves should be avoided for long term use. When worn, use once and dispose. For continuous

		contact we recommend gloves with breakthrough time of more 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognise that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time may be acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. 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.
Eye Protection	:	
Body protection	:	Skin protection not ordinarily required beyond standard issue work clothes.
Thermal hazards	:	Not applicable
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. Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory. Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available. National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/ Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/ Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances, http://www.hse.gov.uk/ Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA), Germany. http://www.dguv.de/inhalt/index.jsp L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/accueil
Environmental Exposure Controls	:	Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour. Take appropriate measures to fulfill the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Chapter 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Colourless Liquid.
Odour	:	Odourless
Odour threshold	:	Not applicable
pH	:	7
Initial Boiling Point and Boiling Range	:	186 - 189 °C / 367 - 372 °F
Melting / freezing point	:	-59 °C / -74 °F
Flash point	:	99 °C / 210 °F(ASTM D-93 / PMCC)
Upper / lower Flammability or Explosion limits	:	2.6 - 12.6 %(V)
Auto-ignition temperature	:	421 °C / 790 °F
Flammability (solid, gas)	:	Not applicable
Vapour pressure	:	ca. 10 Pa at 20 °C / 68 °F
Relative Density	:	1.04 at 3.89 °C / 39.00 °F
Density	:	1,036 kg/m3 at 20 °C / 68 °F
Water solubility	:	Completely miscible.
Solubility in other solvents	:	Readily soluble in various organic solvents.
n-octanol/water partition coefficient (log Pow)	:	ca. -1
Decomposition temperature	:	Note:: Stable., Hygroscopic., No hazardous reaction is expected when handled and stored according to provisions.
Dynamic viscosity	:	55 mPa.s at 20 °C / 68 °F
Kinematic viscosity	:	Data not available.
Vapour density (air=1)	:	2.5 at 20 °C / 68 °F
Electrical conductivity	:	Data not available.
Evaporation rate (nBuAc=1)	:	Not applicable
Surface tension	:	71.6 mN/m at 21.5 °C / 70.7 °F
Molecular weight	:	76.09 g/mol
Hygroscopicity	:	Hygroscopic.

10. STABILITY AND REACTIVITY

Chemical stability	:	Stable. Hygroscopic. No hazardous reaction is expected when handled and stored according to provisions.
Conditions to Avoid	:	Heat, flames, and sparks. Temperatures above 40°C
Incompatible Materials	:	Strong oxidising agents. Strong acids.
Hazardous Decomposition Products	:	Carbonyl and dioxolane derivatives may be formed.
Possibility of Hazardous Reactions	:	Stable under normal conditions of use.
Sensitivity to Static Discharge	:	Not applicable

11. TOXICOLOGICAL INFORMATION

Information on Toxicological effects

Basis for Assessment : Information given is based on product testing, and/or similar products, and/or components.

Likely Routes of Exposure : Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

Acute Toxicity

Acute Oral Toxicity : Low toxicity: LD50 >5000 mg/kg

Acute Dermal Toxicity : Expected to be of low toxicity: LD50 >5000 mg/kg

Acute Inhalation Toxicity : Low toxicity if inhaled.

Skin Corrosion/Irritation : Not irritating to skin.

Serious Eye Damage/Irritation : Not irritating to eye.

Respiratory Irritation : Not expected to be a respiratory irritant.

Respiratory or skin sensitisation : Not expected to be a sensitiser.

Aspiration hazard : Not considered an aspiration hazard.

Germ Cell Mutagenicity : Not mutagenic.

Carcinogenicity : Not expected to be carcinogenic.

Material	:	**Carcinogenicity Classification**
Monopropylene glycol	:	GHS / CLP: No carcinogenicity classification

Reproductive and Developmental Toxicity : Not a developmental toxicant. Does not impair fertility.

Specific target organ toxicity - single exposure : Not expected to be a hazard.

Specific target organ toxicity - repeated exposure : Low systemic toxicity on repeated exposure.

Cats given high doses of MPG in diet showed a decrease in red blood cell survival.

Additional Information : Not applicable

12. ECOLOGICAL INFORMATION

Basis for Assessment : Information given is based on product testing.

Ecotoxicity:

Acute Toxicity

Fish	:	Practically non toxic: LC/EC/IC50 > 100 mg/l
Aquatic crustacea	:	Practically non toxic: LC/EC/IC50 > 100 mg/l
Algae/aquatic plants	:	Practically non toxic: LC/EC/IC50 > 100 mg/l
Microorganisms	:	Expected to be practically non toxic: LC/EC/IC50 > 100 mg/l
Chronic Toxicity		
Fish	:	NOEC/NOEL expected to be > 100 mg/l (based on modeled data)
Aquatic crustacea	:	NOEC/NOEL > 100 mg/l
Mobility	:	If product enters soil, one or more constituents will be mobile and may contaminate groundwater. Dissolves in water.
Persistence/degradability	:	Readily biodegradable.
Bioaccumulative Potential	:	Not expected to bioaccumulate significantly.
Other Adverse Effects	:	Data not available.

13. DISPOSAL CONSIDERATIONS

Material Disposal	:	Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses. Waste product should not be allowed to contaminate soil or water.
Container Disposal	:	Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Send to drum recoverer or metal reclaimer.
Local Legislation	:	Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be in compliance.

14. TRANSPORT INFORMATION

Land (as per ADR classification): Not regulated
UN No: not classified as hazard
UN proper shipping name: Not applicable
Transport hazard class: Not applicable
Packing group (if applicable): Not applicable
Marine pollution (yes/no): No
Special precaution which a user to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises:
- Emergency treat on fire: Not applicable
- Emergency act on leakage: Not applicable

IMDG
UN No: not classified as hazard
UN proper shipping name: Not applicable
Transport hazard class: Not applicable
Packing group (if applicable): Not applicable
Marine pollution (yes/no): No
Special precaution which a user to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises:
- Emergency treat on fire: Not applicable
- Emergency act on leakage: Not applicable

IATA (Country variations may apply)
UN No: not classified as hazard
UN proper shipping name: Not applicable
Transport hazard class: Not applicable
Packing group (if applicable): Not applicable
Marine pollution (yes/no): No
Special precaution which a user to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises:
- Emergency treat on fire: Not applicable
- Emergency act on leakage: Not applicable

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Chemical Inventory Status

AICS	:	Listed.	
DSL	:	Listed.	
EINECS	:	Listed.	200-338-0
ENCS (JP)	:	Listed.	(2)-234
ISHL (JP)	:	Listed.	2-(8)-321
ISHL (JP)	:	Listed.	2-(8)-323
ISHL (JP)	:	Listed.	(2)-234
JEX (JP)	:	Listed.	(2)-234
KECI (KR)	:	Listed.	KE-29267
NZIOC	:	Listed.	
PICCS (PH)	:	Listed.	
TSCA	:	Listed.	
IECSC	:	Listed.	

Local Regulations

INDUSTRY SAFETY HEALTH ACT	:	Prohibited chemicals: Not applicable
	:	Chemicals subject to approval: Not applicable
	:	Chemicals subject to control: Not applicable

TOXIC CHEMICAL CONTROL ACT	:	Toxic chemicals: Not applicable
	:	Observation chemicals: Not applicable
	:	Restricted. Prohibited chemicals: Not applicable
	:	Priority chemicals for chemical accidents: Not applicable
HAZARDOUS MATERIAL ACT	:	Category/Classification of dangerous material: Category 4 Dangerous Goods (Flammable Liquids), Grade 3 petroleum chemicals
WASTE MANAGEMENT ACT	:	Dispose in compliance with local requirements and regulations as applicable.

16. OTHER INFORMATION

Additional Information	:	There are no significant changes to this SDS (i.e. no changes relating to classification and/or safe handling procedures). All changes relate to minor inclusion and/or deletion of phrases.

GHS Hazard statements

None None

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SDS Version Number	:	1.0
SDS Effective Date	:	2013/10/03
SDS Revisions	:	A vertical bar (|) in the left margin indicates an amendment from the previous version.
SDS Regulation	:	In accordance with the provisions of Article 41, Industrial Safety & Health Act
SDS Distribution	:	The information in this document should be made available to all who may handle the product
Key Literature References	:	The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID date base, EC 1272 regulation, etc).
Disclaimer	:	This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.