Test Item	Unit	Result	Test Method
Appearance		Colourless, transparent	ASTM D-4176, VISUAL
Colour (Pt/Co)	max.	25	ASTM D-1209
Purity	% wt min.	99.5	SMS-2886
DEG	% wt max.	0.35	SMS-2886
PEG	% wt max.	0.1	SMS-2886
Water	% wt max.	0.05	ASTM E-203
Ash	mg/kg max.	100	ASTM D-482
Specific Gravity, 20/20 °C		1.124 - 1.126	ASTM D-4052
Boiling Range (0.1013 Mpa)			
5 % vol.	°C min	280	ASTM D-1078
95 % vol.	°C max	295	ASTM D-1078

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

Product name	:	TEG- TRIETHYLENE GLYCOL
Product code	:	U1255
Product type	:	Chemical intermediate.
Use of substance/preparation	:	Use only as a chemical intermediate.
Supplier	:	Shell Chemicals Europe B.V. P.O. Box 8610 3009 AP Rotterdam NL
Contact numbers	:	+31 (0)10 231 7000 Fax: +31 (0)10 231 7180
Emergency telephone number	:	+31 (0)10 431 3233

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substance formal name	:	2,2'-Ethylenedioxydiethanol.
Substance chemical family	:	Glycol.
Common name	:	TEG HP
Synonyms	:	glycol bis (hydroxyethyl) ether Triglycol 2,2 ethylenedioxydiethanol Ethylene triglycol TEG
EINECS	:	203-953-2
CAS-No.	:	112-27-6

Dangerous components/constituents	CAS-No.	EINECS	EC Hazard symbols	EC Risk Phrases	Concentration [%]
	111-46-6	203-872-2	Xn	R22	< 0.50

3. HAZARDS IDENTIFICATION

Human health hazards	:	No specific hazards.
Safety hazards	:	Not classified as flammable but will burn.
Environmental hazards	:	Not classified as dangerous under EC criteria.

4. FIRST AID MEASURES

Symptoms and effects	:	Not expected to give rise to an acute hazard under normal conditions of use.
First Aid - Inhalation	:	Remove to fresh air. If rapid recovery does not occur, obtain medical attention.
First Aid - Skin	:	Wash skin with water using soap if available. If persistent irritation occurs, obtain medical attention.
First Aid - Eye	:	Flush eye with water. If persistent irritation occurs, obtain medical attention.
First Aid - Ingestion	:	Do not induce vomiting. If rapid recovery does not occur, obtain medical attention.

5. FIRE-FIGHTING MEASURES

Specific hazards	:	Hazardous combustion products may include carbon monoxide.
Extinguishing media	:	Alcohol-resistant foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Protective equipment	:	Full protective clothing and self-contained breathing apparatus.
Specific methods	:	Do not use water in a jet.
Other information	:	Keep adjacent containers cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

Protective measures	:	Avoid contact with skin, eyes and clothing. Do not breathe mists, aerosols. Wear monogoggles, PVC gloves, safety shoes or boots - chemical resistant. For guidance on respiratory protection see Section 8.
Environmental precautions	:	Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Inform the local authorities if this cannot be prevented.
Clean-up methods	:	Large spillage: Transfer to a labelled, sealable container for product recovery or safe disposal. Otherwise treat as for small spillage. Small spillage: Absorb or contain liquid with sand, earth or spill control material. Shovel up and place in a labelled, sealable container for subsequent safe disposal. Flush contaminated area with plenty of water.

7. HANDLING AND STORAGE

Handling	:	Avoid prolonged or repeated contact with skin and eyes. Handling temperatures: Ambient. 60 °C maximum.
Storage	:	Keep container tightly closed. Tanks must be clean, dry and rust-free. Storage temperatures: Ambient. 60 °C maximum.
Tank cleaning	:	Cleaning, inspection and maintenance of storage tanks is a specialist operation.
Recommended materials	:	For containers or container linings, use carbon steel, stainless steel.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure standards	:	None established.
Engineering control measures	:	Use local exhaust ventilation.
Hygiene measures	:	Launder overalls and undergarments regularly. Dispose of soiled gloves.

Respiratory protection	:	If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select Respiratory Protective Equipment suitable for the specific conditions of use and meeting relevant legislation. Check with Respiratory Protective Equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure Breathing Apparatus. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapors [boiling point >65℃ (149℉) meeting EN141
Hand protection	:	Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: Longer term protection - PVC gloves 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.
Eye protection	:	monogoggles (EN166)
Body protection	:	standard issue work clothes If splashes are likely to occur, wear: PVC apron safety shoes or boots - chemical resistant
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. Further national methods may be available. National Institute of Occupational Safety and Health (NIOSH), USA: Manual of analytical Methods http://www.cdc.gov/niosh/nmam/nmammenu.html Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha-slc.gov/dts/sltc/methods/toc.html 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/pub/grl/grle.htm L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/indexnosdoss.html

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	:	Liquid
Colour	:	Colourless
Odour	:	Odourless
Boiling point	:	280 - 295 ℃
Melting / freezing point	:	-7 - -4 ℃
Flash point	:	166 ℃ (COC)

Auto-ignition temperature	:	323 °C
Explosion / flammability limits in air	:	0.9 - 9.2 %(V)
Vapour pressure	:	1.33 Pa @ 20 °C
Density	:	1,123 - 1,126 kg/m3 @ 20 °C
Solubility in water	:	Completely miscible.
n-octanol/water partition coefficient (log Pow)	:	-1.24
Kinematic viscosity	:	42.8 mm2/s @ 20 °C

10. STABILITY/REACTIVITY

Stability	:	Stable under normal use conditions. Reacts with strong oxidising agents.
Conditions to avoid	:	Heat, flames and sparks.
Materials to avoid	:	Oxidising agents.
Hazardous decomposition products	:	None expected under normal use conditions.

11. TOXICOLOGICAL INFORMATION

Basis for assessment	:	Information given is based on product data.
Acute toxicity - oral	:	Low toxicity, LD50 > 2000 mg/kg.
Acute toxicity - dermal	:	Low toxicity, LD50 > 2000 mg/kg.
Acute toxicity - inhalation	:	Low toxicity, LD50 > 2000 mg/kg.
Eye irritation	:	Expected to be slightly irritant.
Skin irritation	:	Not irritating.
Skin sensitisation	:	Data not available.
Repeated dose toxicity	:	Repeated exposure does not cause significant toxic effects.
Carcinogenicity	:	Not a carcinogen.
Mutagenicity	:	Positive in in vitro assays. Not considered to be a mutagenic hazard.
Fertility impairment	:	Does not impair fertility.
Development toxicity	:	Causes slight foetotoxicity at doses which are maternally toxic., Effects were seen at high doses only.
Human effects	:	See Section 4 for information regarding acute effects to humans.

12. ECOLOGICAL INFORMATION

Basis for assessment	:	Information given is based on product data.
Mobility	:	If product enters soil, it will be mobile and may contaminate groundwater. Sinks in water.
Persistence/degradability	:	Inherently biodegradable. Oxidises rapidly by photo-chemical reactions in air. Integrated environmental half-life expected to be 10 - < 100 days.
Bioaccumulation	:	Does not bioaccumulate significantly.
Acute toxicity - fish	:	Practically non toxic, LC/EC/IC 50 > 1000 mg/l .
Acute toxicity - algae	:	Expected to be practically non toxic, LC/EC/IC 50 > 1000 mg/l.
Acute toxicity - bacteria	:	Practically non toxic, 100 < LC/EC/IC 50 <= 1000 mg/l .

Acute toxicity - invertebrates	:	Practically non toxic, LC/EC/IC 50 > 1000 mg/l .
Acute toxicity - other organisms	:	Low acute toxicity.
Other information	:	Sewage treatment Practically non toxic, 100 < LC/EC/IC 50 <= 1000 mg/l .

13. DISPOSAL CONSIDERATIONS

Waste disposal	:	Recover or recycle if possible. Otherwise: Incineration.
Product disposal	:	Recover or recycle if possible. Otherwise: Incineration.
Local legislation	:	The recommendations given are considered appropriate for safe disposal. However, local regulations may be more stringent and these must be complied with.

14. TRANSPORT INFORMATION

Other information	:	Not dangerous for conveyance under UN, IMDG, ADR/RID and IATA/ICAO codes.

15. REGULATORY INFORMATION

EC classification	:	Not classified as dangerous under EC criteria.
EINECS	:	203-953-2
TSCA (USA)	:	Listed.
Other information	:	For listing on other inventories, eg MITI (Japan), AICS (Australia) and DSL (Canada), please consult suppliers.

16. OTHER INFORMATION

Uses and restrictions	:	Use only as a chemical intermediate.
Other information	:	Technical contact point For further information, contact your local Shell company or agent. MSDS distribution This document contains important information to ensure the safe storage, handling and use of this product. The information in this document should be brought to the attention of the person in your organisation responsible for advising on safety matters. Reference The content and format of this safety data sheet is in accordance with Commission Directive 2001/58/EC of 27 July 2001, amending for the second time Commission Directive 91/155/EEC.

EC Risk Phrases

R22	Harmful if swallowed.

A vertical bar (|) in the left margin indicates an amendment from the previous version.

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.