

## Propylene Oxide

### ! SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1 . Product identifier

|                                  |                  |
|----------------------------------|------------------|
| <b>Name of product</b>           | Propylene oxide  |
|                                  | Art-Nr(n).: 3600 |
| <b>Name of substance</b>         | Propylene oxide  |
| <b>Index No</b>                  | 603-055-00-4     |
| <b>EC No</b>                     | 200-879-2        |
| <b>REACH registration number</b> | 01-2119480483-35 |
| <b>CAS No</b>                    | 75-56-9          |

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

##### Identified uses

##### Sector of uses [SU]

SU8 - Manufacture of bulk, large scale chemicals (including petroleum products)

##### ! Process categories [PROC]

PROC1 - Use in closed process, no likelihood of exposure

PROC2 - Use in closed, continuous process with occasional controlled exposure

PROC3 - Use in closed batch process (synthesis or formulation)

PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at nondedicated facilities

##### ! Environmental release categories [ERC]

ERC1 - Manufacture of substances.

ERC2 - Formulation of preparations.

ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

##### Uses advised against

##### Remark

Do not use for private purposes (household).

##### Recommended intended purpose(s)

Basic substance. Intermediate.

#### 1.3. Details of the supplier of the safety data sheet

## Propylene Oxide

### Manufacturer / Distributor:

#### Ehsan International Gases

40/9, Aurangabad, Nazimabad  
#3, Karachi 74600, Pakistan.  
+92 21 36612091 – 36612907

[info@ehsan.com.pk](mailto:info@ehsan.com.pk)

[www.ehsan.com.pk](http://www.ehsan.com.pk)

## SECTION 2: Hazards identification

### 2.1 . Classification of the substance or mixture

#### Classification according to 67/548/EEC or 1999/45/EC

F+; R12

Xn; R20/21/22

Xi; R36/37/38

Carc. Cat. 2; R45

Muta. Cat. 2; R46 R-

#### phrases

45 May cause cancer.

46 May cause heritable genetic damage.

12 Extremely flammable.

36/37/38 Irritating to eyes, respiratory system and skin.

20/21/22 Also harmful by inhalation, in contact with skin and if swallowed.

#### Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

| Hazard classes and Hazard categories | Hazard Statements | Classification procedure |
|--------------------------------------|-------------------|--------------------------|
|--------------------------------------|-------------------|--------------------------|

|                     |             |  |
|---------------------|-------------|--|
| <b>Flam. Liq. 1</b> | <b>H224</b> |  |
|---------------------|-------------|--|

|                     |             |  |
|---------------------|-------------|--|
| <b>Acute Tox. 3</b> | <b>H311</b> |  |
|---------------------|-------------|--|

|                     |             |  |
|---------------------|-------------|--|
| <b>Acute Tox. 3</b> | <b>H331</b> |  |
|---------------------|-------------|--|

|                     |             |  |
|---------------------|-------------|--|
| <b>Acute Tox. 4</b> | <b>H302</b> |  |
|---------------------|-------------|--|

|                      |             |  |
|----------------------|-------------|--|
| <b>Skin Irrit. 2</b> | <b>H315</b> |  |
|----------------------|-------------|--|

|                     |             |  |
|---------------------|-------------|--|
| <b>Eye Irrit. 2</b> | <b>H319</b> |  |
|---------------------|-------------|--|

|                 |             |  |
|-----------------|-------------|--|
| <b>Muta. 1B</b> | <b>H340</b> |  |
|-----------------|-------------|--|

|                 |             |  |
|-----------------|-------------|--|
| <b>Carc. 1B</b> | <b>H350</b> |  |
|-----------------|-------------|--|

|                  |             |  |
|------------------|-------------|--|
| <b>STOT SE 3</b> | <b>H335</b> |  |
|------------------|-------------|--|

#### Hazard statements for physical hazards

H224 Extremely flammable liquid and vapour.

#### Hazard statements for health hazards

H302 Harmful if swallowed.

H311 + H331 Toxic in contact with skin or if inhaled.

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H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H335 May cause respiratory irritation.  
H340 May cause genetic defects. H350 May cause cancer.

### 2.2 . Label elements

Labelling according to Regulation (EC) No 1272/2008 [ CLP/GHS ]



GHS02



GHS06



GHS08

### Signal word

Danger

### Hazard statements for physical hazards

H224 Extremely flammable liquid and vapour.

### Hazard statements for health hazards

H302 Harmful if swallowed.  
H311 + H331 Toxic in contact with skin or if inhaled.  
H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H335 May cause respiratory irritation.  
H340 May cause genetic defects. H350 May cause cancer.

### Precautionary Statements

#### Prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking.  
P260 Do not breathe mist/vapours.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.

#### Response

P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P304 + P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.  
P308 + P313 IF exposed or concerned: Get medical advice/attention.

#### Storage

P405 Store locked up.

### Special rules for supplemental label elements for certain mixtures

Restricted to professional users.

### Additional information

#### Remark

The substance may only be used as feedstock.

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### 2.3 . Other hazards

#### Adverse physicochemical effects

In the case of insufficient ventilation and/or through the formation of a explosive/highly flammable mixture is possible.

#### Adverse human health effects and symptoms

Asphyxiant in high concentrations.

#### Information pertaining to special dangers for human and environment

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

## SECTION 3: Composition/ information on ingredients

### 3.1 . Substances

**CAS No 75-56-9 Propylene oxide**

EC No 200-879-2

Index No 603-055-00-4

REACH registration number 01-2119480483-35

### 3.2 . Mixtures

#### Additional advice

The substance has been added to the candidate list for substances of very high concern (SVHC) in accordance with Article 59 (10) of Regulation (EC) No 1907/2006 [ REACH ].

## SECTION 4: First aid measures

### 4.1 . Description of first aid measures

#### General information

Remove contaminated soaked clothing immediately.

Adhere to personal protective measures when giving first aid.

#### In case of inhalation

Remove the casualty into fresh air and keep him immobile.

In the event of pulmonary irritation treat initially with corticoid spray, e.g. Ventolair- or Pulmicort- metered-dose aerosol (Ventolair and Pulmicort are registered trademarks).

Seek medical treatment immediately.

In case of respiratory standstill give artificial respiration by respiratory bag (Ambu bag) or respirator. Send for a doctor.

#### In case of skin contact

In case of contact with skin wash off with warm water.

Refer for medical treatment.

#### In case of eye contact

Eye rinsing with water carefully while protecting unhurt eye.

Call for a doctor immediately.

#### In case of ingestion

Do not induce vomiting.

Medical treatment.

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If swallowed seek medical advice immediately and show the doctor packing or label. Rinse out mouth and give plenty of water to drink.

### 4.2. Most important symptoms and effects, both acute and delayed

#### Physician's information / possible symptoms

Coughing  
Delirious state  
Depression of central nervous system  
Headache  
Nausea  
Dizziness

#### Physician's information / possible dangers

Risk of respiratory disorders  
Risk of pulmonary oedema

### 4.3. Indication of any immediate medical attention and special treatment needed

**Treatment (Advice to doctor)** Treat symptoms.

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## SECTION 5: Firefighting measures

### 5.1 . Extinguishing media

#### Suitable extinguishing media

Alcohol-resistant foam  
Dry powder  
Carbon dioxide

#### Unsuitable extinguishing media

Full water jet

### 5.2. Special hazards arising from the substance or mixture

In case of fire formation of dangerous gases possible.

Formation of explosive gas mixtures in air.

In the event of fire the following can be released:

Carbon monoxide (CO)

### 5.3 . Advice for firefighters

#### Special protective equipment for fire-fighters

Use breathing apparatus with independent air supply ( isolated ). Wear full protective clothing.

#### Additional information

Cool endangered containers with water spray jet.

Exposure to fire may cause containers to rupture / explode.

## Propylene Oxide

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### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

See chapter 8.

Remove persons to safety.

Evacuate area.

Keep away sources of ignition.

#### 6.2 . Environmental precautions

Eliminate ignition sources.

Do not discharge into the drains/surface waters/groundwater.

Prevent spread over a wide area (e.g. by containment or oil barriers).

Do not discharge into the subsoil/soil.

#### 6.3. Methods and material for containment and cleaning up

Ensure adequate air ventilation.

Take up with absorbent material (e.g. general-purpose binder).

Flush away residues with water.

After taking up the material dispose according to regulation.

#### 6.4 . Reference to other sections

Informations for safe handling see chapter 7.

Informations for personal protective equipment see chapter 8.

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### SECTION 7: Handling and storage

#### 7 .1 . Precautions for safe handling

##### Advice on safe handling

Use only in thoroughly ventilated areas.

Transfer and handle only in enclosed systems.

Barrels and installations thoroughly earthing (grounding ).

Treatment only in suitable rooms and systems.

Provide good room ventilation even at ground level (vapours are heavier than air). Prevent cylinders from falling over.

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Ensure valve protection device is correctly fitted.  
Open valve slowly to avoid pressure shock.  
Do not allow backfeed into the container.  
Suck back of water into the container must be prevented.  
No water to valves, flanges and other fittings.  
Purging of pipes and valves with inert gases - to avoid: water, solvents.

### General protective measures

Do not inhale vapours.

### Hygiene measures

At work do not eat, drink and smoke.

### Advice on protection against fire and explosion

The product is combustible.  
Because of risk of explosion avoid vapours getting into cellar, sewage system and holes.  
Take precautionary measures against static discharges.  
Formation of explosive gas mixtures in air.  
Do not use sparking tools.  
Use explosion-proof equipment / fittings and non-sparking tools.

### 7.2. Conditions for safe storage, including any incompatibilities

#### Requirements for storage rooms and vessels

Keep in closed original container.  
Storage: use steel or stainless steel containers.  
Do not use containers, leads, pipes a.s.o. of copper or copper-containing alloys. Ventilate store-rooms thoroughly.

#### Advice on storage compatibility

Do not store with gases.  
Do not store together with animal feedstuffs.  
Do not store together with explosives.  
Do not store together with infectious substances.  
Do not store together with radioactive material.  
Do not store together with toxic liquids or toxic solids.  
Do not store together with food.  
Do not store together with oxidizing agents.

#### Further information on storage conditions

Keep container tightly closed and store at cool and aired place.  
Protect of heat.  
Storage temperature may not exceed 50°C (=122°F).

### 7.3 . Specific end use(s )

#### Recommendation(s) for intended use

Use as an intermediate under strictly controlled conditions.

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## SECTION 8: Exposure controls/personal protection

### 8 .1 . Control parameters

Ingredients with occupational exposure limits to be monitored

## Propylene Oxide

| CAS No  | Name            | Code         | [mg/m <sup>3</sup> ][ppm] | Remark     |
|---------|-----------------|--------------|---------------------------|------------|
| 75-56-9 | Propylene oxide | TWA, 8 hours | 12 5                      | EH40 //UK  |
| 75-56-9 | Propylene oxide | TLV, 8 hours | 4.75 2                    | ACGIH, USA |

### Additional advice

DNEL (workers, inhalation, acute, local effects): 170 mg/m<sup>3</sup>.

DNEL (workers, inhalation, long-term, local effects): 5 mg/m<sup>3</sup>

## 8.2 . Exposure controls

### Respiratory protection

Keep self contained breathing apparatus readily available for emergency use.

In case of rescue and maintenance activities in storage containers use environment-independent breathing apparatus because of risk of suffocation by edging out of air oxygen

Short-term: filter apparatus, filter AX, otherwise environment-independent breathing apparatus.

**Hand protection** chemical-resistant gloves

Glove material specification [make/type, permeation time/life]: CR, <= 15 min

### Eye protection

Safety goggles, in case of increased risk add protective face shield

### Skin protection

Safety shoes with steel toe.

Body covering work clothing, or chemical resistant suit at increased risk.

### Limitation and surveillance of the environment

PNEC (sewage treatment plant): 10 mg/l

PNEC (freshwater): 0.052 mg/l

PNEC (marine water): 0.0052 mg/l

PNEC (water): 0.52 mg/l (intermittent release).

PNEC (freshwater sediment): 0.245 mg/kg sediment dw

PNEC (marine water sediment): 0.0245 mg/kg sediment dw

PNEC (soil): 0.0186 mg/kg soil dw See chapter 7.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

#### Form

liquid

#### Colour

colourless

#### Odour

ethereal

#### Odour threshold

8 .4 - 480 mg/m<sup>3</sup>

### Important health, safety and environmental information

|                                   | Value   | Temperature | at       | Method | Remark |
|-----------------------------------|---------|-------------|----------|--------|--------|
| <b>pH value in delivery state</b> | ca. 7   | 20 °C       | 400 g/l  |        |        |
| <b>boiling point</b>              | 34 °C   |             | 1013 hPa |        |        |
| <b>melting point</b>              | -112 °C |             |          |        |        |



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|                              |             |            |
|------------------------------|-------------|------------|
| <b>Flash point</b>           | -37 °C      | closed cup |
| <b>Ignition temperature</b>  | 430 °C      |            |
| <b>Lower explosion limit</b> | 1 ,9 Vol-%  |            |
| <b>Upper explosion limit</b> | 38 ,8 Vol-% |            |
| <b>Vapour pressure</b>       | 590 hPa     | 20 °C      |

|   | Value                    | Temperature | at | Method | Remark  |
|---|--------------------------|-------------|----|--------|---|
| <b>Relative density</b>                           | 0,83 g/cm <sup>3</sup>   | 20 °C       |    |        | Water = 1 - information concerns to liquid phase. |
| <b>Vapour density</b>                             | 2,01                     |             |    |        | air = 1   |
| <b>Solubility in water</b>                        | 405 g/l                  | 20 °C       |    |        |   |
| <b>Solubility/other</b>                           |                          |             |    |        | soluble in organic solvent                        |
| <b>Partition coefficient (log p<sub>OW</sub>)</b> | 0 , 03                   |             |    |        |   |
| <b>Viscosity dynamic</b>                          | 0,31 mPa*s               | 20 °C       |    |        |   |
| <b>Viscosity kinematic</b>                        | 0,374 mm <sup>2</sup> /s | 20 °C       |    |        |   |
| <b>Vapourisation rate</b>                         | not determined           |             |    |        |   |
| <b>Oxidising properties</b>                       | no                       |             |    |        |   |

### 9.2 . Other information

Vapours are heavier than air.

## SECTION 10: Stability and reactivity

## Propylene Oxide

### 10.1 . Reactivity

See section "Possibility of hazardous reactions".

### 10.2 . Chemical stability

Stable under normal conditions.

This material can be decomposed by high temperatures.

### 10.3 . Possibility of hazardous reactions

Reactions with numerous chemical compounds.

Reactions with alkalis.

Formations of peroxides possible.

Reactions with acids.

Reactions with oxidising agents.

polymerisation

Reactions with amines.

### 10.4 . Conditions to avoid

Formation of explosive gas/air mixtures.

Heat sources / heat - risk of bursting.

### 10.5 . Incompatible materials

#### Materials to avoid

Alkali (lye)

Ammonia

Peroxide

Oxidising agent

Copper, brass and other copper alloys.

Acids.

Plastics may be corroded.

Amine.

### 10.6 . Hazardous decomposition products

Carbon monoxide

### Thermal decomposition

Remark No decomposition if used as directed.

### Additional information

Unstable product may polymerize spontaneously.

## SECTION 11: Toxicological information

### 11.1 . Information on toxicological effects

#### Acute toxicity/Irritability/Sensitization

|                   | Value/Validation | Species             | Method   | Remark |
|-------------------|------------------|---------------------|----------|--------|
| LD50 acute oral   | 382 - 587 mg/kg  | rat (male / female) | OECD 401 |        |
| LD50 acute dermal | 950 mg/kg        | rabbit              |          |        |

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**LC50 acute inhalation** 9,95 mg/l (4 h) rat (male / female) OECD 403

**Irritability skin** irritant rabbit OECD 404

**Irritability eye** irritant rabbit eye

**Skin sensitization** non-sensitizing Guinea pig

**Sensitization respiratory system** not determined

### Subacute Toxicity - Carcinogenicity

|                              | Value                                     | Species             | Method               | Validation   |
|------------------------------|---|---------------------|----------------------|--|
| <b>Subchronic Toxicity</b>   | NOAEC 30 ppm (861 - 868 d)<br>Inhalation  | Rat (male / female) | OECD 453             | Low sub-chronic toxicity.  |
| <b>Mutagenicity</b>          |   |                     | OECD 471 / 475 / 476 | Information on genotoxicity in vivo and in vitro available.              |
| <b>Reproduction-Toxicity</b> | NOAEC (F1) 300 ppm                        | Rat (male / female) | OECD 416             | No reproductive toxicity.  |
| <b>Carcinogenicity</b>       | NOAEC 100 ppm (861 - 868 d)<br>Inhalation | Rat                 | OECD 453             | Indications of carcinogenic effects are available from long-term trials. |

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**Specific target organ toxicity (single exposure)**

May cause respiratory irritation.

### SECTION 12: Ecological information

#### 12.1 . Toxicity

**Ecotoxicological effects**

|                 | Value                | Species                            | Method               | Validation |
|-----------------|----------------------|------------------------------------|----------------------|------------|
| <b>Fish</b>     | LC50 52 mg/l (96 h)  | Oncorhynchus mykiss                | EPA 660/3-75/<br>009 |            |
| <b>Daphnia</b>  | EC50 350 mg/l (48 h) | Daphnia magna                      | EPA 660/3-75/<br>009 |            |
| <b>Algae</b>    | EC50 240 mg/l (96 h) | Pseudokirchneriella<br>subcapitata | EPA 660/3-75/<br>009 |            |
| <b>Bacteria</b> | NOEC 100 mg/l (28 d) |                                    | OECD 301C            |            |

#### 12.2 . Persistence and degradability

|                                       |                |                            |                  |                    |
|---------------------------------------|----------------|----------------------------|------------------|--------------------|
| <b>Physico-chemical degradability</b> |                | Phototransformation<br>air | DT50 air         |                    |
| <b>Biological degradability</b>       | 89 % (28 d)    |                            | modif. MITI-test | readily degradable |
| <b>Degradability</b>                  | not determined |                            |                  |                    |

## Propylene Oxide

### 12.3 . Bioaccumulative potential

Because of the n-octanol/water distribution coefficient (log K o/w) accumulation in organisms is not expected.

### 12.4 . Mobility in soil

Adsorption in the soil is not likely.

### 12.5 . Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

### 12.6 . Other adverse effects

#### Behaviour in sewage plant

When low concentrations are discharged correctly into adapted biological sewage treatment plants, interference with the degradation activity of activated sludge is not likely.

#### Additional ecological information

|     | Value          | Method | Remark |
|-----|----------------|--------|--------|
| COD | not determined |        |        |
| BOD | not determined |        |        |

#### General regulation

Do not allow uncontrolled leakage of product into the environment.

## SECTION 13: Disposal considerations

### 13.1 . Waste treatment methods

#### Waste code No. Name of waste

16 05 08\* discarded organic chemicals consisting of or containing dangerous substances

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 91/689/EEC on hazardous waste.

#### Recommendations for the product

Dispose of as hazardous waste.

#### Recommendations for packaging

Totally emptied packaging: Return to supplier / manufacturer.

## SECTION 14: Transport information

#### Land and inland navigation transport ADR/RID

UN 1280 PROPYLENE OXIDE, 3, I, (D/E), Classification code: F 1

#### Marine transport IMDG

## Propylene Oxide

UN 1280 PROPYLENE OXIDE, 3, I  
Ems: F-E, S-D

### Air transport ICAO/IATA-DGR

UN 1280 Propylene oxide, 3, I  
Cargo aircraft only: max. 30 l.  
Passenger aircraft: max. 1 l.

### Special precautions for user

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

### Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

No transport as bulk according IBC - Code.

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## SECTION 15: Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

#### Other regulations (EU)

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 28 - 30.

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 40.

Verordnung (EG) Nr. 1907/2006 zur Registrierung, Bewertung, Zulassung und Beschränkung chemischer Stoffe (REACH), Anhang XVII Nr. 3.

Directive 96/82/EC on the control of major-accident hazards involving dangerous substances.

#### VOC standard

**VOC content** >=99 % 20 °C 590 hPa

### 15.2. Chemical Safety Assessment

An exposure scenario is not required.

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## SECTION 16: Other information

### Recommended uses and restrictions

National and local regulations concerning chemicals shall be observed.

### Further information

All declarations of safety-data-sheet refer to pure substance.

The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product. Indication of changes: "!" = Data changed compared with the previous version.

### Wording of the R/H-phrases specified in chapter 3 (not the classification of the mixture!)

R 12 Extremely flammable.

## Propylene Oxide

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 45 May cause cancer.

R 46 May cause heritable genetic damage.

H224 Extremely flammable liquid and vapour.

H302 Harmful if swallowed.

H311 Toxic in contact with skin.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H331 Toxic if inhaled.

H335 May cause respiratory irritation.

H340 May cause genetic defects (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard).

H350 May cause cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard).