

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

1.1. Product identifier

Product form	: Substance
Physical state	: Liquid
Substance name	: CYCLOHEXENE
Product code	: ENEC0620
Formula	: C6H10
Synonyms	: TETRAHYDROBENZENE BENZENETETRAHYDRIDE
Chemical family	: HYDROCARBON

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

1.2.1. Relevant identified uses

Use of the substance/mixture : Chemical intermediate

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

GELEST, INC.

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1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Flammable liquids, Category 2	H225
Acute toxicity (oral), Category 4	H302
Acute toxicity (dermal), Category 4	H312
Full text of H statements : see section 16	

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

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

Hazard pictograms (CLP) :



GHS02

GHS07

Signal word (CLP) :

Danger

Hazard statements (CLP) :

H225 - Highly flammable liquid and vapour.
H302+H312 - Harmful if swallowed or in contact with skin

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Precautionary statements (CLP) : P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240 - Ground/bond container and receiving equipment.
P264 - Wash hands thoroughly after handling.
P330 - Rinse mouth.
P301+P312 - IF SWALLOWED: Call a doctor if you feel unwell.

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance type : Mono-constituent
Name : CYCLOHEXENE
CAS-No. : 110-83-8
EC-No. : 203-807-8

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Cyclohexene	(CAS-No.) 110-83-8 (EC-No.) 203-807-8	95 - 100	Flam. Liq. 2, H225 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312

Full text of H-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.
First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If you feel unwell, seek medical advice.
First-aid measures after skin contact : Wash with plenty of water/.... Get medical advice/attention.
First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention.
First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Get medical advice/attention.

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

Symptoms/effects after inhalation : May cause irritation to the respiratory tract.
Symptoms/effects after skin contact : May cause mild skin irritation. Harmful in contact with skin.
Symptoms/effects after eye contact : May cause eye irritation.
Symptoms/effects after ingestion : Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

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

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Water fog. Foam. Carbon dioxide. Dry chemical.
Unsuitable extinguishing media : None known.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Highly flammable liquid and vapour. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame.
Explosion hazard : May form flammable/explosive vapour-air mixture.

5.3. Advice for firefighters

Firefighting instructions : Exercise caution when fighting any chemical fire. Use water spray or fog for cooling exposed containers.
Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapour and mist.

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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Eliminate every possible source of ignition. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel

Protective equipment : Wear protective equipment as described in Section 8.

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it. Collect spillage. Use only non-sparking tools.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Handle empty containers with care because residual vapours are flammable. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Precautions for safe handling : Avoid all eye and skin contact and do not breathe vapour and mist. Ground/bond container and receiving equipment. Provide good ventilation in process area to prevent formation of vapour. Take precautionary measures against static discharge. Use only non-sparking tools.

Hygiene measures : Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.

Storage conditions : Keep container tightly closed. Keep in a cool place.

Incompatible materials : Oxidizing agent.

Storage area : Store in a well-ventilated place. Store away from heat.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Cyclohexene (110-83-8)		
Austria	MAK (mg/m ³)	1015 mg/m ³
Austria	MAK (ppm)	300 ppm
Austria	MAK Short time value (mg/m ³)	4060 mg/m ³
Austria	MAK Short time value (ppm)	1200 ppm
Belgium	Limit value (mg/m ³)	1025 mg/m ³
Belgium	Limit value (ppm)	300 ppm
France	VME (mg/m ³)	1015 mg/m ³
France	VME (ppm)	300 ppm
Greece	OEL TWA (mg/m ³)	1015 mg/m ³
Greece	OEL TWA (ppm)	300 ppm
Italy - Portugal - USA ACGIH	ACGIH TWA (ppm)	300 ppm
USA IDLH	US IDLH (ppm)	2000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1015 mg/m ³
USA NIOSH	NIOSH REL (TWA) (ppm)	300 ppm
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1015 mg/m ³
USA OSHA	OSHA PEL (TWA) (ppm)	300 ppm
Spain	VLA-ED (mg/m ³)	1020 mg/m ³

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Cyclohexene (110-83-8)		
Spain	VLA-ED (ppm)	300 ppm
Switzerland	MAK (mg/m ³)	1015 mg/m ³
Switzerland	MAK (ppm)	300 ppm
Czech Republic	Expoziční limity (PEL) (mg/m ³)	1000 mg/m ³
Denmark	Grænseværdie (langvarig) (mg/m ³)	1015 mg/m ³
Denmark	Grænseværdie (langvarig) (ppm)	300 ppm
Finland	HTP-arvo (8h) (mg/m ³)	1000 mg/m ³
Finland	HTP-arvo (8h) (ppm)	300 ppm
Finland	HTP-arvo (15 min)	1300 mg/m ³
Finland	HTP-arvo (15 min) (ppm)	380 ppm
Ireland	OEL (8 hours ref) (mg/m ³)	1015 mg/m ³
Ireland	OEL (8 hours ref) (ppm)	300 ppm
Ireland	OEL (15 min ref) (mg/m ³)	3045 mg/m ³ (calculated)
Ireland	OEL (15 min ref) (ppm)	900 ppm (calculated)
Lithuania	IPRV (mg/m ³)	50 mg/m ³
Norway	Grenseverdier (AN) (mg/m ³)	510 mg/m ³
Norway	Grenseverdier (AN) (ppm)	150 ppm
Norway	Grenseverdier (Korttidsverdi) (mg/m ³)	510 mg/m ³
Norway	Grenseverdier (Korttidsverdi) (ppm)	150 ppm
Poland	NDS (mg/m ³)	300 mg/m ³
Poland	NDSCh (mg/m ³)	900 mg/m ³
Romania	OEL TWA (mg/m ³)	700 mg/m ³
Romania	OEL TWA (ppm)	208 ppm
Romania	OEL STEL (mg/m ³)	1200 mg/m ³
Romania	OEL STEL (ppm)	357 ppm
Slovakia	NPHV (priemerná) (mg/m ³)	1000 mg/m ³
Slovakia	NPHV (priemerná) (ppm)	300 ppm
Canada (Quebec)	VEMP (mg/m ³)	1010 mg/m ³
Canada (Quebec)	VEMP (ppm)	300 ppm
Australia	TWA (mg/m ³)	1010 mg/m ³
Australia	TWA (ppm)	300 ppm
Portugal	OEL TWA (ppm)	300 ppm

8.2. Exposure controls

Appropriate engineering controls:

Provide local exhaust or general room ventilation.

Personal protective equipment:

Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection:

Neoprene or nitrile rubber gloves

Eye protection:

Chemical goggles. Contact lenses should not be worn

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified organic vapor (black cartridge) respirator.

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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Clear liquid.
Molecular mass	: 82.14 g/mol
Colour	: No data available
Odour	: strong.
Odour threshold	: No data available
Refractive index	: 1.446
pH	: No data available
Relative evaporation rate (butylacetate=1)	: > 1
Melting point	: -104 °C
Freezing point	: No data available
Boiling point	: 83 °C
Flash point	: -12 °C
Auto-ignition temperature	: 250 °C
Decomposition temperature	: No data available
Flammability (solid, gas)	: Highly flammable liquid and vapour.
Vapour pressure	: 160 mm Hg @ 30°C
Relative vapour density at 20 °C	: 2.8
Relative density	: 0.811
% Volatiles	: 100 %
Solubility	: Insoluble in water. Water: 1.8 mg/l
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: 1.2 - 7.7 vol % (lower; upper)

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Heat. Open flame. Sparks.

10.5. Incompatible materials

Oxidizing agent.

10.6. Hazardous decomposition products

Organic acid vapors.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Harmful if swallowed. Harmful in contact with skin.

CYCLOHEXENE (110-83-8)

ATE CLP (oral)	1300 mg/kg bodyweight
ATE CLP (dermal)	1231 mg/kg bodyweight

Cyclohexene (110-83-8)

LD50 oral rat	1300 mg/kg
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Cyclohexene (110-83-8)

LD50 dermal rabbit	1231 mg/kg
ATE CLP (oral)	1300 mg/kg bodyweight
ATE CLP (dermal)	1231 mg/kg bodyweight

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified
STOT-repeated exposure	: Not classified
Aspiration hazard	: Not classified
Symptoms/effects after inhalation	: May cause irritation to the respiratory tract.
Symptoms/effects after skin contact	: May cause mild skin irritation. Harmful in contact with skin.
Symptoms/effects after eye contact	: May cause eye irritation.
Symptoms/effects after ingestion	: Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic toxicity	: Not classified
Chronic aquatic toxicity	: Not classified

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

Other adverse effects : This substance may be hazardous to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Sewage disposal recommendations	: Do not dispose of waste into sewer.
Product/Packaging disposal recommendations	: Incinerate. Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.
Additional information	: Handle empty containers with care because residual vapours are flammable.
Ecology - waste materials	: Avoid release to the environment.

SECTION 14: Transport information

14.1. UN number

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No. (ADR)	: 2256
UN-No. (IMDG)	: 2256
UN-No. (IATA)	: 2256
UN-No. (ADN)	: 2256
UN-No. (RID)	: 2256

14.2. UN proper shipping name

Proper Shipping Name (ADR)	: CYCLOHEXENE
Proper Shipping Name (IMDG)	: CYCLOHEXENE
Proper Shipping Name (IATA)	: Cyclohexene

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Proper Shipping Name (ADN)	: CYCLOHEXENE
Proper Shipping Name (RID)	: CYCLOHEXENE
Transport document description (ADR)	: UN 2256 CYCLOHEXENE, 3, II, (D/E)
Transport document description (IMDG)	: UN 2256 CYCLOHEXENE, 3, II
Transport document description (IATA)	: UN 2256 Cyclohexene, 3, II
Transport document description (ADN)	: UN 2256 CYCLOHEXENE, 3, II
Transport document description (RID)	: UN 2256 CYCLOHEXENE, 3, II

14.3. Transport hazard class(es)

ADR

Transport hazard class(es) (ADR)	: 3
Danger labels (ADR)	: 3



IMDG

Transport hazard class(es) (IMDG)	: 3
Danger labels (IMDG)	: 3



IATA

Transport hazard class(es) (IATA)	: 3
Hazard labels (IATA)	: 3



ADN

Transport hazard class(es) (ADN)	: 3
Danger labels (ADN)	: 3



RID

Transport hazard class(es) (RID)	: 3
Danger labels (RID)	: 3



14.4. Packing group

Packing group (ADR)	: II
Packing group (IMDG)	: II

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Packing group (IATA) : II
Packing group (ADN) : II
Packing group (RID) : II

14.5. Environmental hazards

Dangerous for the environment : No
Marine pollutant : No
Other information : No supplementary information available

14.6. Special precautions for user

- Overland transport

Classification code (ADR) : F1
Limited quantities (ADR) : 1I
Excepted quantities (ADR) : E2
Packing instructions (ADR) : P001, IBC02, R001
Mixed packing provisions (ADR) : MP19
Portable tank and bulk container instructions (ADR) : T4
Portable tank and bulk container special provisions (ADR) : TP1
Tank code (ADR) : LGBF
Vehicle for tank carriage : FL
Transport category (ADR) : 2
Special provisions for carriage - Operation (ADR) : S2, S20
Hazard identification number (Kemler No.) : 33
Orange plates :

33
2256

Tunnel restriction code (ADR) : D/E
EAC code : 3YE

- Transport by sea

Limited quantities (IMDG) : 1 L
Excepted quantities (IMDG) : E2
Packing instructions (IMDG) : P001
IBC packing instructions (IMDG) : IBC02
Tank instructions (IMDG) : T4
Tank special provisions (IMDG) : TP1
EmS-No. (Fire) : F-E
EmS-No. (Spillage) : S-D
Stowage category (IMDG) : E

- Air transport

PCA Excepted quantities (IATA) : E2
PCA Limited quantities (IATA) : Y341
PCA limited quantity max net quantity (IATA) : 1L
PCA packing instructions (IATA) : 353
PCA max net quantity (IATA) : 5L
CAO packing instructions (IATA) : 364
CAO max net quantity (IATA) : 60L
ERG code (IATA) : 3H

- Inland waterway transport

Classification code (ADN) : F1
Limited quantities (ADN) : 1 L
Excepted quantities (ADN) : E2
Equipment required (ADN) : PP, EX, A
Ventilation (ADN) : VE01

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Number of blue cones/lights (ADN) : 1

- Rail transport

Classification code (RID) : F1
Limited quantities (RID) : 1L
Excepted quantities (RID) : E2
Packing instructions (RID) : P001, IBC02, R001
Mixed packing provisions (RID) : MP19
Portable tank and bulk container instructions (RID) : T4
Portable tank and bulk container special provisions (RID) : TP1
Tank codes for RID tanks (RID) : LGBF
Transport category (RID) : 2
Colis express (express parcels) (RID) : CE7
Hazard identification number (RID) : 33

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

No REACH Annex XVII restrictions

CYCLOHEXENE is not on the REACH Candidate List

CYCLOHEXENE is not on the REACH Annex XIV List

CYCLOHEXENE is not subject to REGULATION (EU) No 649/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 concerning the export and import of hazardous chemicals.

CYCLOHEXENE is not subject to Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC

% Volatiles : 100 %

15.1.2. National regulations

Germany

Reference to AwSV : Water hazard class (WGK) 2, Significantly hazardous to water (KBwS-Beschluss; ID No. 65)
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands

SZW-lijst van kankerverwekkende stoffen : CYCLOHEXENE is listed
SZW-lijst van mutagene stoffen : The substance is not listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : The substance is not listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : The substance is not listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : The substance is not listed

Denmark

Classification remarks : Emergency management guidelines for the storage of flammable liquids must be followed
Danish National Regulations : Pregnant/breastfeeding women working with the product must not be in direct contact with the product

15.2. Chemical safety assessment

No additional information available

SECTION 16: Other information

Abbreviations and acronyms:

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Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development; GHS: The Globally Harmonized System of Classification and Labelling; APF: Assigned Protection Factor

Other information : Prepared by safety and environmental affairs.

Full text of H- and EUH-statements:

Acute Tox. 4 (Dermal)	Acute toxicity (dermal), Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Flam. Liq. 2	Flammable liquids, Category 2
H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.

SDS EU (REACH Annex II) - Custom

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The logo for Gelest, featuring the word "Gelest" in a large, white, serif font. The letters are set against a light blue background that is shaped like a right-angled triangle pointing to the right. The "G" is partially cut off by the left edge of the frame.