Piperylene

Safety Data Sheet

according to US HazCom 2024

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SECTION 1 Identification

1.1. Product identifier

Product form	:	Substance
Trade name	:	Piperylene
CAS-No.	:	102110-15-6
Product code	:	P510
Formula	:	Unspecified

1.2. Other means of identification

EC Index No. (Report)	:	649-399-00-9
EC-No.	:	310-013-6

1.3. Recommended use of the chemical and restrictions on use

Use of the substance/mixture	:	Product for industrial use only
Restrictions on use	:	No additional information available

1.4. Supplier's details

Braskem America, Inc.
1735 Market Street
Philadelphia, PA 19103-7583
Tel: (800) 396 - 5251
productsafety@braskem.com

1.5. Emergency phone number

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

SECTION 2 Hazard Identification

2.1. Classification of the substance or mixture

GHS US classification

Flammable liquid, Category 2	Highly flammable liquid and vapor.
Acute toxicity (oral), Category 4	Harmful if swallowed.
Acute toxicity (inhalation), Category 4	Harmful if inhaled.
Skin corrosion/irritation, Category 2	Causes skin irritation.
Serious eye damage/eye irritation, Category 2A	Causes serious eye irritation.
Germ cell mutagenicity, Category 2	Suspected of causing genetic defects.
Carcinogenicity, Category 1B	May cause cancer (Inhalation, oral).
Reproductive toxicity, Category 2	Suspected of damaging fertility or the unborn child (Inhalation, oral).
Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation	May cause respiratory irritation.
Specific target organ toxicity — Repeated exposure, Category 1	Causes damage to organs (Auditory system, nervous system, visual system) through prolonged or repeated exposure.
Aspiration hazard, Category 1	May be fatal if swallowed and enters airways.

2.2. Label elements

GHS US labeling

Hazard pictograms (GHS US) :

Signal word (GHS US) : Danger

Hazard statements (GHS US)	:	Highly flammable liquid and vapor Harmful if swallowed or if inhaled May be fatal if swallowed and enters airways Causes skin irritation Causes serious eye irritation May cause respiratory irritation Suspected of causing genetic defects. May cause cancer (Inhalation, oral). Suspected of damaging fertility or the unborn child (Inhalation, oral) Causes damage to organs (Auditory system, nervous system, visual system) through prolonged or repeated exposure
Precautionary statements (GHS US)	:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground/Bond container and receiving equipment. Use explosion-proof electrical, lighting, ventilating equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe mist, spray, vapors. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves. If swallowed: Immediately call a poison center or doctor. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed or concerned: Get medical advice/attention. Call a poison center or doctor if you feel unwell. Rinse mouth. Do NOT induce vomiting. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. In case of fire: Use carbon dioxide (CO2), dry extinguishing powder, foam to extinguish. Store in a well-ventilated place. Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up. Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

2.3. Hazards associated with known or reasonably anticipated uses

No additional information available

2.4. Hazards not otherwise classified

Other hazards which do not result in classification	:	Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level. Burning liquid may float on water. May spread fire. Very toxic to aquatic life with long lasting effects.

2.5. Unknown acute toxicity

No additional information available

SECTION 3 Composition/information on ingredients

3.1. Substances

Substance type : UVCB
Name : Hydrocarbons, C5-rich, dicyclopentadiene-containing
CAS-No. : 102110-15-6

Name	Product identifier	%	GHS US classification
Hydrocarbons, C5-rich, dicyclopentadiene-containing	CAS-No.: 102110-15-6	100	Flam. Liq. 2, H225 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Muta. 2, H341 Carc. 1B, H350 Repr. 2, H361 STOT SE 3, H335 STOT RE 1, H372 Asp. Tox. 1, H304
1,3-Pentadiene, (E)-	CAS-No.: 2004-70-8	15 - 40	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Asp. Tox. 1, H304
1,3-Pentadiene, (Z)-	CAS-No.: 1574-41-0	10 - 30	Flam. Liq. 2, H225 Asp. Tox. 1, H304
Cyclopentene	CAS-No.: 142-29-0	10 - 30	Flam. Liq. 2, H225 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Skin Irrit. 2, H315 Asp. Tox. 1, H304
Cyclopentane	CAS-No.: 287-92-3	7 -13	Flam. Liq. 2, H225
2-Methyl-2-butene	CAS-No.: 513-35-9	>5	Flam. Liq. 2, H225 Acute Tox. 4 (Oral), H302 Skin Irrit. 2, H315 Muta. 2, H341 Carc. 2, H351 STOT SE 3, H336 Asp. Tox. 1, H304
Cyclopentadiene	CAS-No.: 542-92-7	0 – 5	Flam. Liq. 3, H226 Acute Tox. 3 (Oral), H301 Acute Tox. 3 (Dermal), H311 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H335
n-Pentane	CAS-No.: 109-66-0	< 5	Flam. Liq. 2, H225 STOT SE 3, H336 Asp. Tox. 1, H304

Name	Product identifier	%	GHS US classification
Dicyclopentadiene	CAS-No.: 77-73-6	0 – 4	Flam. Liq. 2, H225 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H335
Neohexane	CAS-No.: 75-83-2	0 – 1.5	Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304
1,3-Butadiene, 2-methyl-	CAS-No.: 78-79-5	< 1	Flam. Liq. 1, H224 Muta. 2, H341 Carc. 1B, H350
.beta.-Amylene-trans	CAS-No.: 646-04-8	0 – 1	Flam. Liq. 1, H224 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H335 Asp. Tox. 1, H304
cis-2-Pentene	CAS-No.: 627-20-3	0 – 1	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H335 Asp. Tox. 1, H304

*Chemical name, CAS number and/or exact concentration have been withheld as a trade secret

3.2. Mixtures

Not applicable

SECTION 4 First aid measures

4.1. Description of necessary first-aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). In all cases of doubt, or when symptoms persist, seek medical attention.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. Do not apply mouth-to-mouth resuscitation. Get medical advice/attention if you feel unwell.

First-aid measures after skin contact : After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water and soap. Immediately rinse with plenty of water (for at least 15 minutes). Wash contaminated clothing before reuse. Seek medical attention if ill effect or irritation develops. In case of doubt or persistent symptoms, consult always a physician.

First-aid measures after eye contact : Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum). Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical attention if ill effect or irritation develops.

First-aid measures after ingestion : If swallowed, rinse mouth with water (only if the person is conscious). Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Seek immediate medical advice.

4.2. Most important symptoms/effects, acute and delayed

Symptoms/effects : Causes damage to organs (Auditory system, nervous system, visual system) through prolonged or repeated exposure. May cause cancer (Inhalation, oral). Suspected of damaging fertility or the unborn child (Inhalation, oral). Suspected of causing genetic defects.

Symptoms/effects after inhalation : Harmful if inhaled. May cause respiratory irritation. Overexposure to vapors may result in cough.

Symptoms/effects after skin contact	:	Causes skin irritation.
Symptoms/effects after eye contact	:	Causes serious eye irritation.
Symptoms/effects after ingestion	:	Harmful if swallowed. May be fatal if swallowed and enters airways. May result in aspiration into the lungs, causing chemical pneumonia. Ingestion may cause nausea, vomiting and diarrhea.

4.3. Indication of immediate medical attention and special treatment needed, if necessary

Note to physician :	:	Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media	:	carbon dioxide (CO2), dry chemical powder, foam. Sand.
Unsuitable extinguishing media	:	Do not use water jet. Do not use a heavy water stream.

5.2. Specific hazards arising from the chemical

Fire hazard	:	Highly flammable liquid and vapor. Material can accumulate some static charge during transfer. May mass explode in fire. Vapors are heavier than air and may travel considerable distance to an ignition source and flash back to source of vapors. Incomplete combustion releases dangerous carbon monoxide, carbon dioxide and other toxic gases.
Explosion hazard	:	May mass explode in fire. May form flammable/explosive vapor-air mixture.
Hazardous decomposition products in case of fire	:	Incomplete combustion releases dangerous carbon monoxide, carbon dioxide and other toxic gases.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions	:	In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. In case of fire: Stop leak if safe to do so. Hose down area with water. Cool adjacent tanks / containers / drums with water jet. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.
Protection during firefighting	:	In case of hazardous fumes, wear autonomous breathing apparatus. Full protective flameproof clothing. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6 Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	:	Avoid contact with spilled material. Keep away from sources of ignition - No smoking. Use special care to avoid static electric charges. Spilled material may present a slipping hazard. Do not breathe. vapors. mist. spray. Keep away from open flames, hot surfaces and sources of ignition. Evacuate unnecessary personnel. Notify authorities if product enters sewers or public waters.

For non-emergency personnel

Protective equipment	:	Complete protective clothing. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures	:	Evacuate unnecessary personnel. Avoid contact with skin, eyes and clothing. No open flames, no sparks, and no smoking. Do not breathe mist, spray, vapors.

For emergency responders

Protective equipment	:	Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures	:	Ventilate area. Stop leak if safe to do so. Eliminate all ignition sources if safe to do so. Evacuate unnecessary personnel. Prevent the product from entering drains or confined areas. Notify authorities if liquid enters sewers or public waters.

Environmental precautions	:	Air : Use water curtains to contain the toxic clouds. In soil and sediments : Take up liquid spill into absorbent material, e.g.: sand, earth, vermiculite or powdered limestone. Absorb remaining liquid with sand or inert absorbent and remove to safe place. Water : Containment as appropriate. Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.2. Methods and materials for containment and cleaning up

For containment	:	Clean up any spills as soon as possible, using an absorbent material to collect it. Stop leak, if possible without risk. Keep away from sources of ignition - No smoking. Wear recommended personal protective equipment. Do not touch spilled material. Evacuate unnecessary personnel.
Methods for cleaning up	:	Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents). Stop leak if safe to do so. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials. Handling this product may result in electrostatic accumulation. Use proper grounding procedures.
Other information	:	Dispose in a safe manner in accordance with local/national regulations.

For further information refer to section 8: "Exposure controls/personal protection". For disposal of residues refer to section 13 : "Disposal considerations".

SECTION 7 Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Provide good ventilation in process area to prevent formation of vapor. Do not breathe mist, spray, vapors. Avoid contact with eyes, skin and clothing. Use grounded electrical/mechanical equipment. Use only non-sparking tools. Avoid ignition sources. No open flames. No smoking. Spilled product must never be returned to the original container for recycling. Wash contaminated clothing before reuse.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.
Additional hazards when processed	:	Product can accumulate electrostatic charges that may cause fire by electrical discharges. Handle empty containers with care because residual vapors are flammable.

7.2. Conditions for safe storage, including incompatibilities

Technical measures	:	Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical, lighting, ventilating equipment. Use only non-sparking tools. Keep away from sources of ignition - No smoking.
Storage conditions	:	Keep away from open flames, hot surfaces and sources of ignition. Store in dry, cool, well-ventilated area. At room temperature the product is neither an irritant nor gives off hazardous vapors. Use only non-sparking tools. Keep in fireproof place. Keep container tightly closed. Store locked up.
Storage area	:	Store in dry, cool, well-ventilated area. Keep away from sources of ignition. Keep away from heat and direct sunlight.
Incompatible materials	:	Strong oxidizing agents. Halogens. Strong acids and oxidants. Reducing agents. Certain plastics, rubbers and coatings. Strong bases.
Specific end uses	:	See Heading 1.
Packaging materials	:	Storage in steel recommended.

SECTION 8 Exposure controls/personal protection

8.1. Control parameters

2-Methyl-2-butene (513-35-9)	
USA - ACGIH - Occupational Exposure Limits	
Local name	2-Methyl-2-butene
ACGIH® TLV® TWA	10 ppm
Remark (ACGIH®)	TLV® Basis: Clastogenic eff
Regulatory reference	ACGIH 2025

Cyclopentane (287-92-3)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Cyclopentane
ACGIH® TLV® TWA	1000 ppm (EX - Explosion hazard)
Remark (ACGIH®)	TLV® Basis: CNS impair
Regulatory reference	ACGIH 2025
USA - Cal/OSHA - Occupational Exposure Limits	
Local name	Cyclopentane
Cal/OSHA PEL (OEL TWA)	1720 mg/m³
	600 ppm
Regulatory reference	California Division of Occupational Safety and Health (Cal/OSHA) - Permissible Exposure Limit for Chemical Contaminants (Table AC-1)
USA - NIOSH - Occupational Exposure Limits	
NIOSH REL TWA	1720 mg/m³
	600 ppm

Cyclopentadiene (542-92-7)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Cyclopentadiene
ACGIH® TLV® TWA	2.7 mg/m³
	0.5 ppm
ACGIH® TLV® STEL	5.1 mg/m³
	1 ppm
Remark (ACGIH®)	TLV® Basis: URT, LTR & Eye irr; CNS eff
Regulatory reference	ACGIH 2025
USA - OSHA - Occupational Exposure Limits	
Local name	Cyclopentadiene
OSHA PEL TWA	200 mg/m³
	75 ppm
Regulatory reference (US-OSHA)	OSHA Annotated Table Z-1
USA - Cal/OSHA - Occupational Exposure Limits	
Local name	Cyclopentadiene

Cyclopentadiene (542-92-7)	
Cal/OSHA PEL (OEL TWA)	200 mg/m³
	75 ppm
Regulatory reference	California Division of Occupational Safety and Health (Cal/OSHA) - Permissible Exposure Limit for Chemical Contaminants (Table AC-1)
USA - IDLH - Occupational Exposure Limits	
IDLH	750 ppm
USA - NIOSH - Occupational Exposure Limits	
Local name	Cyclopentadiene
NIOSH REL TWA	200 mg/m³
	75 ppm
NIOSH REL 10h TWA	75 ppm
Regulatory reference (US-NIOSH)	OSHA Annotated Table Z-1 (NIOSH Pocket Guide to Chemical Hazards (NPG))

Dicyclopentadiene (77-73-6)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Dicyclopentadiene, including Cyclopentadiene
ACGIH® TLV® TWA	2.7 mg/m³
	0.5 ppm
ACGIH® TLV® STEL	5.1 mg/m³
	1 ppm
Remark (ACGIH®)	TLV® Basis: URT, LTR & Eye irr; CNS eff
Regulatory reference	ACGIH 2025
USA - Cal/OSHA - Occupational Exposure Limits	
Local name	Dicyclopentadiene
Cal/OSHA PEL (OEL TWA)	30 mg/m³
	5 ppm
Regulatory reference	California Division of Occupational Safety and Health (Cal/OSHA) - Permissible Exposure Limit for Chemical Contaminants (Table AC-1)
USA - NIOSH - Occupational Exposure Limits	
NIOSH REL TWA	30 mg/m³
	5 ppm

n-Pentane (109-66-0)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Pentane
ACGIH® TLV® TWA	2950 mg/m³
	1000 ppm
Remark (ACGIH®)	TLV® Basis: Narcosis; resp tract irr

n-Pentane (109-66-0)	
Regulatory reference	ACGIH 2025
USA - OSHA - Occupational Exposure Limits	
Local name	Pentane
OSHA PEL TWA	2950 mg/m³
	1000 ppm
Regulatory reference (US-OSHA)	OSHA Annotated Table Z-1
USA - Cal/OSHA - Occupational Exposure Limits	
Local name	Pentane
Cal/OSHA PEL (OEL TWA)	1800 mg/m³
	600 ppm
Regulatory reference	California Division of Occupational Safety and Health (Cal/OSHA) - Permissible Exposure Limit for Chemical Contaminants (Table AC-1)
USA - IDLH - Occupational Exposure Limits	
IDLH	1500 ppm (10% LEL)
USA - NIOSH - Occupational Exposure Limits	
Local name	Pentane
NIOSH REL TWA	350 mg/m³
	120 ppm
NIOSH REL 10h TWA	120 ppm
NIOSH REL C	1800 mg/m³
	610 ppm [15-min]
Regulatory reference (US-NIOSH)	OSHA Annotated Table Z-1 (NIOSH Pocket Guide to Chemical Hazards (NPG))

1,3-Butadiene, 2-methyl- (78-79-5)	
USA - AIHA - Occupational Exposure Limits	
WEEL TWA	2 ppm

Neohexane (75-83-2)	
USA - ACGIH - Occupational Exposure Limits	
Local name	2,2-Dimethyl butane
ACGIH® TLV® TWA	200 ppm
Remark (ACGIH®)	TLV® Basis: URT irr; lung dam. Notations: A3 (Confirmed Animal Carcinogen with Unknown Relevance to Humans)
ACGIH® chemical category	Confirmed Animal Carcinogen with Unknown Relevance to Humans
Regulatory reference	ACGIH 2025

8.2. Appropriate engineering controls

Appropriate engineering controls : All equipment used when handling the product must be grounded. Ensure good ventilation of the work station. Mechanical ventilation is recommended. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use spark-/explosionproof appliances and lighting system.

Environmental exposure controls : Avoid release to the environment.

8.3. Individual protection measures, such as personal protective equipment

Hand protection:

Impermeable protective gloves. ISO 374-1. Please follow the instructions related to the permeability and the penetration time provided by the manufacturer. Do not reuse gloves

Type	Material	Permeation	Thickness (mm)	Penetration
Disposable gloves, E.g. KCL Type: 730 or 890 or equivalent	Nitrile, or, Viton	< 480 Minutes.	0,4 / 0,7	Not known

Eye protection:

Full face piece respirator. Chemical goggles or safety glasses. ISO 16321-1

Skin and body protection:

Use chemically protective clothing. Long sleeved protective clothing.

Respiratory protection:

Approved organic vapor respirator. An approved organic vapor respirator/supplied air or self-contained breathing apparatus must be used when vapor concentration exceeds applicable exposure limits. Consult a national health and safety authority for further guidance

Device	Filter type	Condition
Full face mask, with cartridge/filter	Ax	Concentrations exceed max allowed workplace atmospheric concentrations.

Other information:
Do not eat, drink or smoke during use.

SECTION 9 Physical and chemical properties

9.1. Basic physical and chemical properties

Physical state	:	Liquid
Color	:	Colorless
Odor	:	Hydrocarbon-like
Odor threshold	:	No data available
pH	:	No data available
Melting point	:	No data available
Freezing point	:	-141 – -87.5 °C Information refers to cis-1,3-pentadiene and trans-1,3-pentadiene
Boiling point	:	42 – 44 °C Information refers to cis-1,3-pentadiene and trans-1,3-pentadiene
Flash point	:	-29 – -28 °C (closed cup) Information refers to cis-1,3-pentadiene and trans-1,3-pentadiene
Flammability (solid, gas)	:	Not applicable Highly flammable liquid and vapor.
Vapor pressure	:	405 mm Hg (25°C)
Relative vapor density at 20°C	:	2.35
Relative density	:	No data available
Density	:	0.676 g/m³ (20°C)

Solubility	:	Water: 690 mg/l Ethanol: Miscible Ether: Miscible Acetone: Miscible
Partition coefficient n-octanol/water (Log Pow)	:	2.44
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Explosion limits	:	Lower explosion limit: 2 vol % Upper explosion limit: 8.3 vol %
Particle characteristics	:	No data available

9.2. Data relevant with regard to physical hazard classes (supplemental)

No additional information available

SECTION 10 Stability and reactivity

10.1. Reactivity

Highly flammable liquid and vapor. May form flammable/explosive vapor-air mixture. Attacks some forms of plastics, rubber, and coatings.

10.2. Chemical stability

Static-accumulating. Stable at room temperature.

10.3. Possibility of hazardous reactions

Explosive when mixed with oxidizing substances. May polymerize on exposure to temperature rise.

10.4. Conditions to avoid

Minimize exposure to air. No flames, no sparks. Eliminate all sources of ignition. Direct sunlight. Extremely high or low temperatures. Open flame.

10.5. Incompatible materials

Strong oxidizing agents. Halogens. Strong acids and oxidants. Certain plastics, rubbers and coatings. Reducing agents. Strong bases.

10.6. Hazardous decomposition products

Thermal decomposition may produce : Carbon oxides (CO, CO2).

SECTION 11 Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Harmful if swallowed.
Acute toxicity (dermal)	:	Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (inhalation)	:	Harmful if inhaled.

Piperylene (102110-15-6)	
ATE US (oral)	960.822 mg/kg body weight
ATE US (gases)	4500 ppmV/4h
ATE US (vapors)	11 mg/l/4h
ATE US (dust, mist)	1.5 mg/l/4h

1,3-Pentadiene, (E)- (2004-70-8)	
LD50 oral	2500 mg/kg
LD50 dermal	3200 mg/kg
LC50 Inhalation - Rat (Vapors)	58.2 mg/l/4h

Cyclopentene (142-29-0)	
LD50 oral rat	2140 µl/kg (Source: NLM_CIP)
LD50 dermal rabbit	1231 mg/kg (Source: ECHA_API)
LC50 Inhalation - Rat	> 22.9 mg/l/4h

2-Methyl-2-butene (513-35-9)	
LD50 oral rat	700 – 2600 mg/kg (Source: OECD_SIDS)
LD50 oral	1000 mg/kg
LD50 dermal rat	> 2000 mg/kg (Source: OECD_SIDS)
LD50 dermal	2500 mg/kg
LC50 Inhalation - Rat	> 174.97 mg/kg Source: International Uniform ChemicaL Information Database
LC50 Inhalation - Rat [ppm]	> 61000 ppm/4h
LC50 Inhalation - Rat (Vapors)	175 mg/l/4h

Cyclopentane (287-92-3)	
LD50 oral rat	11400 mg/kg (Source: NLM_CIP)
LD50 oral	5000 mg/kg
LC50 Inhalation - Rat	> 25.3 mg/l/4h
LC50 Inhalation - Rat (Vapors)	> 25.3 mg/l Source: ECHA

Cyclopentadiene (542-92-7)	
LD50 oral rat	113 mg/kg (Source: NLM_CIP)
LD50 oral	113 mg/kg
LD50 dermal rabbit	430 mg/kg
LD50 dermal	430 mg/kg
LC50 Inhalation - Rat	39 mg/l (Exposure time: 1 h Source: JAPAN_GHS)
LC50 Inhalation - Rat (Vapors)	19.5 mg/l/4h

Dicyclopentadiene (77-73-6)	
LD50 oral rat	346.5 mg/kg (Source: JAPAN_GHS)
LD50 dermal rat	> 2000 mg/kg body weight Animal: rat, Guideline: OECD Guideline 402 (Acute Dermal Toxicity)
LD50 dermal rabbit	4380 mg/kg (Source: JAPAN_GHS)
LC50 Inhalation - Rat	1910 mg/m³ (Exposure time: 6 h Source: ECHA_API)

n-Pentane (109-66-0)	
LD50 oral rat	> 2000 mg/kg (Source: EU_RAR)
LD50 dermal rabbit	3000 mg/kg (Source: OECD_SIDS)
LC50 Inhalation - Rat	364 g/m³ (Exposure time: 4 h Source: NLM_CIP)
LC50 Inhalation - Rat (Vapors)	364 mg/l Source: ChemIDplus

1,3-Butadiene, 2-methyl- (78-79-5)	
LD50 oral rat	> 2000 mg/kg

1,3-Butadiene, 2-methyl- (78-79-5)	
LD50 oral	2125 mg/kg
LD50 dermal rat	> 1 ml/kg (Source: NLM_CIP)
LC50 Inhalation - Rat	180 mg/l/4h
LC50 Inhalation - Rat (Vapors)	180 mg/l Source: SIDS

Neohexane (75-83-2)	
LD50 dermal rabbit	> 5 ml/kg (Source: ECHA_API)

Skin corrosion/irritation : Causes skin irritation.

Serious eye damage/irritation : Causes serious eye irritation.

Respiratory or skin sensitization : Not classified (Based on available data, the classification criteria are not met)

Germ cell mutagenicity : Suspected of causing genetic defects.

Carcinogenicity : May cause cancer (Inhalation, oral).

1,3-Butadiene, 2-methyl- (78-79-5)	
IARC group	2B - Possibly carcinogenic to humans
National Toxicity Program (NTP) Status	Reasonably anticipated to be Human Carcinogen, Evidence of Carcinogenicity
In OSHA Hazard Communication Carcinogen list	Yes

Reproductive toxicity : Suspected of damaging fertility or the unborn child (Inhalation, oral).

Dicyclopentadiene (77-73-6)	
NOAEL (animal/female, F0/P)	20 mg/kg body weight Animal: rat, Animal sex: female, Guideline: OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)

n-Pentane (109-66-0)	
NOAEL (animal/male, F0/P)	300 mg/kg body weight Animal: rat, Animal sex: male, Guideline: OECD Guideline 415 [One-Generation Reproduction Toxicity Study (before 9 October 2017)]
NOAEL (animal/female, F0/P)	≥ 1000 mg/kg body weight Animal: rat, Animal sex: female, Guideline: OECD Guideline 415 [One-Generation Reproduction Toxicity Study (before 9 October 2017)]

STOT-single exposure : May cause respiratory irritation.

2-Methyl-2-butene (513-35-9)	
STOT-single exposure	May cause drowsiness or dizziness.

Cyclopentadiene (542-92-7)	
STOT-single exposure	May cause respiratory irritation.

Dicyclopentadiene (77-73-6)	
STOT-single exposure	May cause respiratory irritation.

n-Pentane (109-66-0)	
STOT-single exposure	May cause drowsiness or dizziness.

.beta.-Amylene-trans (646-04-8)	
STOT-single exposure	May cause respiratory irritation.

cis-2-Pentene (627-20-3)	
STOT-single exposure	May cause respiratory irritation.

Neohexane (75-83-2)	
STOT-single exposure	May cause drowsiness or dizziness.

STOT-repeated exposure : Causes damage to organs (Auditory system, nervous system, visual system) through prolonged or repeated exposure.

Cyclopentane (287-92-3)	
NOAEC (inhalation,rat,vapor,90 days)	30 mg/l air Animal: rat, Guideline: OECD Guideline 413 (Subchronic Inhalation Toxicity: 90-Day Study), Guideline: EPA OTS 798.2450 (90-Day Inhalation Toxicity)

n-Pentane (109-66-0)	
NOAEC (inhalation,rat,vapor,90 days)	30 mg/l air Animal: rat, Guideline: OECD Guideline 413 (Subchronic Inhalation Toxicity: 90-Day Study), Guideline: EPA OTS 798.2450 (90-Day Inhalation Toxicity),

1,3-Butadiene, 2-methyl- (78-79-5)	
LOAEC (inhalation, rat, dust/mist/fume, 90 days)	> 19.503 mg/l air Animal: rat, Guideline: OECD Guideline 413 (Subchronic Inhalation Toxicity: 90-Day Study)
NOAEC (inhalation, rat, 90 days)	613 mg/m³
NOAEC (inhalation,rat,vapor,90 days)	0.613 mg/l air Animal: rat, Guideline: OECD Guideline 453 (Combined Chronic Toxicity / Carcinogenicity Studies)
NOAEC (inhalation,rat,dust/mist/fume,90 days)	19.503 mg/l air Animal: rat, Guideline: OECD Guideline 413 (Subchronic Inhalation Toxicity: 90-Day Study)

Aspiration hazard : May be fatal if swallowed and enters airways.

Cyclopentene (142-29-0)	
Viscosity, kinematic	0.303 mm²/s

2-Methyl-2-butene (513-35-9)	
Viscosity, kinematic	0.307 mm²/s

Cyclopentane (287-92-3)	
Viscosity, kinematic	0.59 mm²/s

Dicyclopentadiene (77-73-6)	
Viscosity, kinematic	0.791 mm²/s

n-Pentane (109-66-0)	
Viscosity, kinematic	0.358 mm²/s

1,3-Butadiene, 2-methyl- (78-79-5)	
Viscosity, kinematic	0.308 mm²/s

Neohexane (75-83-2)	
Viscosity, kinematic	0.46 mm²/s Temp.: '20°C' Parameter: 'kinematic viscosity (in mm²/s)'

Symptoms/effects : Causes damage to organs (Auditory system, nervous system, visual system) through prolonged or repeated exposure. May cause cancer (Inhalation, oral). Suspected of damaging fertility or the unborn child (Inhalation, oral). Suspected of causing genetic defects.

Symptoms/effects after inhalation : Harmful if inhaled. May cause respiratory irritation. Overexposure to vapors may result in cough.

Symptoms/effects after skin contact : Causes skin irritation.

Symptoms/effects after eye contact	:	Causes serious eye irritation.
Symptoms/effects after ingestion	:	Harmful if swallowed. May be fatal if swallowed and enters airways. May result in aspiration into the lungs, causing chemical pneumonia. Ingestion may cause nausea, vomiting and diarrhea.
Other information	:	Likely routes of exposure: ingestion, inhalation, skin and eye.

SECTION 12 Ecological information

12.1. Ecotoxicity

Hazardous to the aquatic environment, short–term (acute)	:	Not a OSHA HazCom 2024 hazard endpoint
Hazardous to the aquatic environment, long–term (chronic)	:	Not a OSHA HazCom 2024 hazard endpoint

12.2. Persistence and degradability

Piperylene (102110-15-6)	
Persistence and degradability	Not persistent.

12.3. Bioaccumulative potential

Piperylene (102110-15-6)	
Partition coefficient n-octanol/water (Log Pow)	2.44
Bioaccumulative potential	not bioaccumulable. Based on the n-octanol/water partition coefficient accumulation in organisms is not expected.
1,3-Pentadiene, (E)- (2004-70-8)	
Partition coefficient n-octanol/water (Log Pow)	2.44
1,3-Pentadiene, (Z)- (1574-41-0)	
Partition coefficient n-octanol/water (Log Pow)	2.4
2-Methyl-2-butene (513-35-9)	
BCF - Fish [1]	(low potential to bioaccumulate)
Partition coefficient n-octanol/water (Log Pow)	2.67 Source: SIDS
Cyclopentane (287-92-3)	
Partition coefficient n-octanol/water (Log Pow)	3 (at 25 °C (at pH 7)
Cyclopentadiene (542-92-7)	
Partition coefficient n-octanol/water (Log Pow)	2.25 Source: HSDB
Dicyclopentadiene (77-73-6)	
BCF - Fish [1]	(53 dimensionless (edible fraction)
Partition coefficient n-octanol/water (Log Pow)	2.78 (at 25 °C (at pH 7)
n-Pentane (109-66-0)	
Partition coefficient n-octanol/water (Log Pow)	3.45 (at 25 °C (at pH 7)
1,3-Butadiene, 2-methyl- (78-79-5)	
BCF - Fish [1]	(no bioaccumulation expected)
Partition coefficient n-octanol/water (Log Pow)	3.2 – 4.5 (at 20 °C)

.beta.-Amylene-trans (646-04-8)	
Partition coefficient n-octanol/water (Log Pow)	2.58

cis-2-Pentene (627-20-3)	
Partition coefficient n-octanol/water (Log Pow)	2.6 Source: National Library of Medicine/Hazardous Substances Data Bank

Neohexane (75-83-2)	
Partition coefficient n-octanol/water (Log Pow)	3.8

12.4. Mobility in soil

Piperylene (102110-15-6)	
Ecology - soil	Product is volatile. Mobility in soil.

.beta.-Amylene-trans (646-04-8)	
Mobility in soil	81 Source: National Library of Medicine/Hazardous Substances Data Bank

cis-2-Pentene (627-20-3)	
Mobility in soil	81 Source: National Library of Medicine/Hazardous Substances Data Bank

12.5. Other adverse effects

Ozone : Not a OSHA HazCom 2024 hazard endpoint
Fluorinated greenhouse gases : No

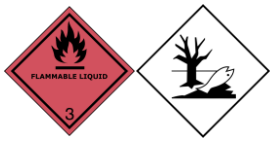
Other information : Avoid release to the environment.

SECTION 13 Disposal considerations

Waste treatment methods : Can be incinerated according to local regulations. Dispose of contents/container in accordance with licensed collector's sorting instructions.
Product/Packaging disposal recommendations : Dispose in a safe manner in accordance with local/national regulations.
Additional information : Do not re-use empty containers. Flammable vapors may accumulate in the container. Handle empty containers with care because residual vapors are flammable.
Ecological waste information : Avoid release to the environment. Hazardous waste due to toxicity.

SECTION 14 Transport information

In accordance with DOT / TDG / IMDG / IATA

DOT	TDG	IMDG	IATA
14.1. UN number			
UN3295	UN3295	3295	3295
14.2. Proper Shipping Name			
Hydrocarbons, liquid, n.o.s.	HYDROCARBONS, LIQUID, N.O.S.	HYDROCARBONS, LIQUID, N.O.S.	Hydrocarbons, liquid, n.o.s.
14.3. Transport hazard class(es)			
3	3	3	3
			

DOT	TDG	IMDG	IATA
14.4. Packing group			
II	II	II	II
14.5. Environmental hazards			
Dangerous for the environment: Yes	Dangerous for the environment: Yes	Dangerous for the environment: Yes Marine pollutant: Yes	Dangerous for the environment: Yes
No supplementary information available			

14.6. Transport in bulk

IBC code : Applicable.
IBC product name : 1,3-Pentadiene (greater than 50%), cyclopentene and isomers, mixtures.
Ship type : Type 2
Pollutant category : Y

14.7. Special precautions for user

DOT

UN-No. (DOT) : UN3295
DOT Special Provisions (49 CFR 172.102) : 144 - If transported as a residue in an underground storage tank (UST), as defined in 40 CFR 280.12, that has been cleaned and purged or rendered inert according to the American Petroleum Institute (API) Standard 1604 (IBR, see 171.7 of this subchapter), then the tank and this material are not subject to any other requirements of this subchapter. However, sediments remaining in the tank that meet the definition for a hazardous material are subject to the applicable regulations of this subchapter.
IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized.
T7 - 4 178.274(d)(2) Normal..... 178.275(d)(3)
TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = 97 / 1 + a (tr - tf) Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.
TP8 - A portable tank having a minimum test pressure of 1.5 bar (150 kPa) may be used when the flash point of the hazardous material transported is greater than 0 C (32 F).
TP28 - A portable tank having a minimum test pressure of 2.65 bar (265 kPa) may be used provided the calculated test pressure is 2.65 bar or less based on the MAWP of the hazardous material, as defined in 178.275 of this subchapter, where the test pressure is 1.5 times the MAWP.
DOT Packaging Exceptions (49 CFR 173.xxx) : 150
DOT Packaging Non Bulk (49 CFR 173.xxx) : 202
DOT Packaging Bulk (49 CFR 173.xxx) : 242
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 5 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 60 L
DOT Vessel Stowage Location : B - (i) The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) ‘‘On deck only’’ on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.

TDG

UN-No. (TDG) : UN3295
TDG Special Provisions : 150 - An approved ERAP is required for the dangerous goods referred to in paragraph 7.2(1)(f) of Part 7 (Emergency Response Assistance Plan).

Explosive Limit and Limited Quantity Index	:	1 L
Excepted quantities (TDG)	:	E2
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index	:	5 L
Emergency Response Guide (ERG) Number	:	128

IMDG

Limited quantities (IMDG)	:	1 L
Excepted quantities (IMDG)	:	E2
Packing instructions (IMDG)	:	P001
IBC packing instructions (IMDG)	:	IBC02
Tank instructions (IMDG)	:	T7
Tank special provisions (IMDG)	:	TP1, TP8, TP28
EmS-No. (Fire)	:	F-E - FIRE SCHEDULE Echo - NON-WATER-REACTIVE FLAMMABLE LIQUIDS
EmS-No. (Spillage)	:	S-D - SPILLAGE SCHEDULE Delta - FLAMMABLE LIQUIDS
Stowage category (IMDG)	:	B
Properties and observations (IMDG)	:	Immiscible with water.
MFAG-No	:	128

IATA

Special provision (IATA)	:	A3, A324
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

SECTION 15 Regulatory information

15.1. Federal regulations

Commercial status of components according to the United States Environmental Protection Agency's Toxic Substances Control Act (TSCA):

Name	CAS-No.	Listing	Commercial status	Flags
1,3-Pentadiene, (E)-	2004-70-8	Present	Active	
1,3-Pentadiene, (Z)-	1574-41-0	Present	Active	
Cyclopentene	142-29-0	Present	Active	
2-Methyl-2-butene	513-35-9	Present	Active	
Cyclopentane	287-92-3	Present	Active	
Cyclopentadiene	542-92-7	Present	Active	SP
Dicyclopentadiene	77-73-6	Present	Active	
n-Pentane	109-66-0	Present	Active	
1,3-Butadiene, 2-methyl-	78-79-5	Present	Active	
.beta.-Amylene-trans	646-04-8	Present	Active	
cis-2-Pentene	627-20-3	Present	Active	
Neohexane	75-83-2	Present	Active	

This product or mixture is not known to contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.		
Dicyclopentadiene	CAS-No. 77-73-6	0 – 4%
1,3-Butadiene, 2-methyl-	CAS-No. 78-79-5	< 1%

1,3-Butadiene, 2-methyl- (78-79-5)	
CERCLA RQ	100 lb

15.2. International regulations

No additional information available

15.3. State regulations

Contact supplier for regulatory information.

SECTION 16 Other information

according to US HazCom 2024

Revision date	:	27 November 2025
Issue date	:	5 October 2011
Data sources	:	Data arise from reference works and literature.
Other information	:	None.

Safety Data Sheet (SDS), USA - Braskem

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. It warns that the handling of any chemical substance requires the previous knowledge of its hazards for the user. It is up to the user of the product company providing this SDS to and promote the training of its employees about possible risks come upon of the product. The information contained herein is not absolute, but only general information on the use of the chemical and indication of safety and security measures.