

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

1.1. Product identifier

Product form : Substance
Trade name : Piperylene
CAS No : 102110-15-6

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

Use of the substance/mixture : Product for industrial use only

1.3. Details of the supplier of the safety data sheet

US office:
Braskem S.A.
5100 Westheimer Rd - Suite 495
Houston, 77056 - USA
Tel: 713 255 4747
Fax: 713 255 4740

Manufacturer:
Braskem S.A.
Rua Eteno, 1561
Polo Petroquímico de Camaçari
42810-000 – Camaçari – BA – Brasil
Tel. (55 71) 3413-1111 or 0800-71-5454

1.4. Emergency telephone number

Emergency number : +55 71 3413-1111

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Flam. Liq. 2 H225
Acute Tox. 4 (Oral) H302
Skin Irrit. 2 H315
Eye Irrit. 2A H319
Muta. 1B H340
Carc. 1B H350
Asp. Tox. 1 H304

Full text of H statements : see section 16

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US) :



GHS02



GHS07



GHS08

Signal word (GHS-US) :

: Danger

Hazard statements (GHS-US) :

: H225 - Highly flammable liquid and vapour
H302 - Harmful if swallowed
H304 - May be fatal if swallowed and enters airways
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H340 - May cause genetic defects
H350 - May cause cancer

Precautionary statements (GHS-US) :

: P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, open flames, hot surfaces, sparks. - No smoking
P233 - Keep container tightly closed
P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical, lighting, ventilating equipment
P242 - Use only non-sparking tools

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P243 - Take precautionary measures against static discharge
P264 - Wash hands thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P280 - Wear eye protection, protective gloves
P301+P310 - If swallowed: Immediately call a doctor, a POISON CENTER
P301+P312 - If swallowed: Call a doctor, a POISON CENTER if you feel unwell
P302+P352 - If on skin: Wash with plenty of water
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P308+P313 - If exposed or concerned: Get medical advice/attention
P330 - Rinse mouth
P331 - Do NOT induce vomiting
P332+P313 - If skin irritation occurs: Get medical advice/attention
P337+P313 - If eye irritation persists: get medical advice/attention
P362+P364 - Take off contaminated clothing and wash it before reuse
P370+P378 - In case of fire: Use carbon dioxide (CO₂), dry extinguishing powder, foam to extinguish
P403+P235 - Store in a well-ventilated place. Keep cool
P405 - Store locked up
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

2.3. Other hazards

other hazards which do not result in classification : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level. Burning liquid may float on water. May spread fire.

2.4. Unknown acute toxicity (GHS US)

Not applicable.

SECTION 3: Composition/information on ingredients

3.1. Substance

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 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Muta. 1B, H340 Carc. 1B, H350 Asp. Tox. 1, H304
Trans-1,3 pentadiene	(CAS No) 2004-70-8	38.84	Not classified
1,3-Pentadiene, (Z)-	(CAS No) 1574-41-0	24.17	Flam. Liq. 2, H225 Asp. Tox. 1, H304
Cyclopentene	(CAS No) 142-29-0	16.32	Flam. Liq. 2, H225 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H311 Skin Irrit. 2, H315 Asp. Tox. 1, H304
Cyclopentane	(CAS No) 287-92-3	9.5	Flam. Liq. 2, H225
Cyclopentadiene + Dicyclopentadiene	(CAS No) 542-92-7	<7	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 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

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Name	Product identifier	%	GHS-US classification
2-Methyl-2-butene	(CAS No) 513-35-9	>= 1	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
Pentane	(CAS No) 109-66-0	< 5	Flam. Liq. 2, H225 STOT SE 3, H336 Asp. Tox. 1, H304
hydrocarbonates	(CAS No) Not available	1.97	Not classified
Isoprene	(CAS No) 78-79-5	< 1	Flam. Liq. 1, H224 Muta. 2, H341 Carc. 1B, H350

Full text of H-statements: see section 16

Synonym: 1,3 pentadiene; Petroleum Destilates, NOS

3.2. Mixture

Not applicable

4.1. Description of 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).
First-aid measures after inhalation	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. In case of irregular breathing or respiratory arrest provide artificial respiration. Do not apply mouth-to-mouth resuscitation.
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. Rinse skin with water/shower. Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation persists, seek medical attention.
First-aid measures after eye contact	: In case of contact with eyes, rinse immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Subsequently consult an ophthalmologist. Avoid any direct contact with the product. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: get medical advice/attention.
First-aid measures after ingestion	: If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Do not induce vomiting. If accidentally swallowed rinse the mouth with plenty of water (only if the person is conscious) and obtain immediate medical attention. Keep victim warm and rested. Seek immediate medical advice.

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

Symptoms/injuries	: May cause genetic defects. May cause cancer.
Symptoms/injuries after inhalation	: Overexposure to vapours may result in cough.
Symptoms/injuries after skin contact	: May be harmful in contact with skin. Causes skin irritation.
Symptoms/injuries after eye contact	: Causes serious eye irritation.
Symptoms/injuries after ingestion	: Harmful if swallowed. Ingestion may cause nausea, vomiting and diarrhea. May result in aspiration into the lungs, causing chemical pneumonia. May be fatal if swallowed and enters airways.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

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

5.2. Special hazards arising from the substance or mixture

Fire hazard	: Highly flammable liquid and vapour. This material can accumulate static charge by flow or agitation and can be ignited by static discharge. May mass explode in fire. Vapours can travel considerable distances to a source of ignition where they can ignite, flash back, or explode. Incomplete combustion releases dangerous carbon monoxide, carbon dioxide and other toxic gases.
Explosion hazard	: May mass explode in fire. May form flammable/explosive vapour-air mixture.
Reactivity	: No dangerous reactions known under normal conditions of use.

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5.3. Advice for firefighters

- 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.
- Protective equipment for firefighters : 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 ignition sources. Remove ignition sources. Use special care to avoid static electric charges. No open flames. No smoking.
- 6.1.1. For non-emergency personnel**
- Protective equipment : Complete protective clothing. Refer to section 8.
- Emergency procedures : Eliminate all ignition sources if safe to do so. Do not drink, eat or smoke in the workplace. Full impermeable protective equipment. Evacuate unnecessary personnel.
- 6.1.2. For emergency responders**
- Protective equipment : Complete protective clothing. In case of fire: Wear self-contained breathing apparatus. Evacuate unnecessary personnel. Refer to section 8. Equip cleanup crew with proper protection.
- Emergency procedures : Eliminate all ignition sources if safe to do so. Evacuate unnecessary personnel. Full impermeable protective equipment. Ventilate area.

6.2. Environmental precautions

Air. Use water curtains to contain the toxic clouds. In soil and sediments : Take up liquid spill into inert absorbent material, e.g.: sand, earth, vermiculite or powdered limestone. Absorb remaining liquid with sand or inert absorbent and remove to safe place. Water : Prevent spread over a wide area (e.g. by containment or oil barriers). Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

- For containment : Clean up any spills as soon as possible, using an absorbent material to collect it. Eliminate leaks immediately. 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 : Depending on the local regulations it may be disposed of as solid waste or incinerated in a suitable installation. Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents). Eliminate leaks immediately. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.

6.4. Reference to other sections

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

- Additional hazards when processed : Handle empty containers with care because residual vapours are flammable.
- Precautions for safe handling : Avoid ignition sources. This material can accumulate static charge by flow or agitation and can be ignited by static discharge. Use only antistatically equipped (spark-free) tools. Use grounded electrical/mechanical equipment. Spilled product must never be returned to the original container for recycling. Provide good ventilation in process area to prevent formation of vapour. No open flames. No smoking. Use only non-sparking tools.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practices. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Keep container closed when not in use. Keep away from sources of ignition. Use only in well-ventilated areas. Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical equipment.
- 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 vapours. Use only non-sparking tools. Keep in fireproof place. Keep container tightly closed.

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Incompatible materials	: Strong oxidizing agents. Halogens. Strong acids and oxidants. Reducing agents. Certain plastics, rubbers and coatings. Strong bases.
Storage area	: Store in dry, cool, well-ventilated area. Keep away from sources of ignition. Keep away from heat and direct sunlight.
Packaging materials	: Store in tightly closed, leak-proof containers of carbon steel or stainless steel.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Cyclopentane (287-92-3)		
ACGIH	ACGIH TWA (ppm)	600 ppm
ACGIH	Remark (ACGIH)	URT, eye, & skin irr; CNS impair
Cyclopentadiene (542-92-7)		
ACGIH	ACGIH TWA (ppm)	75 ppm
ACGIH	Remark (ACGIH)	URT & eye irr
OSHA	OSHA PEL (TWA) (mg/m ³)	200 mg/m ³
OSHA	OSHA PEL (TWA) (ppm)	75 ppm
Dicyclopentadiene (77-73-6)		
ACGIH	ACGIH TWA (ppm)	5 ppm
ACGIH	Remark (ACGIH)	URT, LRT, & eye irr
Pentane (109-66-0)		
ACGIH	ACGIH TWA (ppm)	1000 ppm
OSHA	OSHA PEL (TWA) (mg/m ³)	2950 mg/m ³
OSHA	OSHA PEL (TWA) (ppm)	1000 ppm

8.2. Exposure controls

Appropriate engineering controls	: Mechanical ventilation is recommended. Explosion-proof electrical equipment and lighting with earth.
Hand protection	: VITON gloves. Protective gloves made of PVC. No. Butyl caoutchouc (butyl rubber). Wear protective gloves.
Eye protection	: Full face piece respirator. if necessary: tightly fitting safety goggles. Chemical goggles or safety glasses.
Skin and body protection	: Use chemically protective clothing. Wear suitable protective clothing.
Respiratory protection	: Wear respiratory protection. Use self-contained breathing apparatus. Wear respiratory protection.
Other information	: Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Colour	: colourless
Odour	: Hydrocarbon-like
Odour threshold	: No data available
pH	: Not available
Relative evaporation rate (butyl acetate=1)	: Not available
Melting point	: No data available
Freezing point	: -141 °C* -87.5 °C**
Boiling point	: 42 °C * 44 °C**
Flash point	: -29 °C* -28 °C **(closed cup)

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Auto-ignition temperature	: Not available
Decomposition temperature	: Not available
Flammability (solid, gas)	: Not applicable
Vapour pressure	: 405 mm Hg (25 °C)
Relative vapour density at 20 °C	: 2.35
Relative density	: No data available
Density	: 0.676 g/m ³ (20 °C)
Solubility	: Water: 690 mg/l Ethanol: Miscible Ether: Miscible Acetone: Miscible
Log Pow	: 2.44
Log Kow	: No data available
Viscosity, kinematic	: Not available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: 2 - 8.3 vol %

9.2. Other information

* Information referent to Cis-1,3-pentadieno.

** Information referent to Trans-1,3-pentadieno

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable at room temperature. May polymerize on exposure to temperature rise. Highly flammable liquid and vapour. Attacks some forms of plastics, rubber, and coatings. Highly flammable liquid and vapour. May form flammable/explosive vapour-air mixture.

10.3. Possibility of hazardous reactions

Oxidizing agents, strong. Halogens. strong oxidants and strong acids. reducing agents. Attacks some forms of plastics, rubber, and coatings. On burning: release of lead oxides carbon monoxide - carbon dioxide.

10.4. Conditions to avoid

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

10.5. Incompatible materials

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

10.6. Hazardous decomposition products

On burning: release of carbon monoxide - carbon dioxide. Explosive when mixed with oxidizing substances. fume. Carbon monoxide. Carbon dioxide. May release flammable gases.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed.

Cyclopentene (142-29-0)	
ATE US (oral)	500 mg/kg bodyweight
ATE US (dermal)	1100 mg/kg bodyweight
2-Methyl-2-butene (513-35-9)	
ATE US (oral)	500 mg/kg bodyweight
Cyclopentadiene (542-92-7)	
LD50 oral rat	113 mg/kg
LD50 dermal rabbit	430 mg/kg
LC50 inhalation rat (mg/l)	39 mg/l (Exposure time: 1 h)
Dicyclopentadiene (77-73-6)	
LD50 oral rat	346.5 mg/kg

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Dicyclopentadiene (77-73-6)	
LD50 dermal rabbit	4380 mg/kg
LC50 inhalation rat (ppm)	500 ppm/4h
Pentane (109-66-0)	
LD50 dermal rabbit	3000 mg/kg
LC50 inhalation rat (mg/l)	364 g/m ³ (Exposure time: 4 h)
Isoprene (78-79-5)	
LD50 oral rat	2043 mg/kg
LD50 dermal rat	> 1 ml/kg
LC50 inhalation rat (mg/l)	180 mg/l/4h

Skin corrosion/irritation	: Causes skin irritation. pH: Not available
Serious eye damage/irritation	: Causes serious eye irritation. pH: Not available
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: May cause genetic defects. Based on available data, the classification criteria are not met
Carcinogenicity	: May cause cancer.

Isoprene (78-79-5)	
IARC group	2B - Possibly carcinogenic to humans
National Toxicology Program (NTP) Status	1 - Evidence of Carcinogenicity, 3 - Reasonably anticipated to be Human Carcinogen

Reproductive toxicity	: Not classified Based on available data, the classification criteria are not met
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: May be fatal if swallowed and enters airways.
Symptoms/injuries after inhalation	: Overexposure to vapours may result in cough.
Symptoms/injuries after skin contact	: May be harmful in contact with skin. Causes skin irritation.
Symptoms/injuries after eye contact	: Causes serious eye irritation.
Symptoms/injuries after ingestion	: Harmful if swallowed. Ingestion may cause nausea, vomiting and diarrhea. May result in aspiration into the lungs, causing chemical pneumonia. May be fatal if swallowed and enters airways.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: Harmful to aquatic life with long lasting effects.
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2-Methyl-2-butene (513-35-9)	
EC50 Daphnia 1	3 mg/l (Exposure time: 48 h - Species: Daphnia magna)
Cyclopentane (287-92-3)	
EC50 Daphnia 1	10.5 mg/l (Exposure time: 48 h - Species: Daphnia magna)
Dicyclopentadiene (77-73-6)	
LC50 fish 1	11.5 - 17.6 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])
EC50 Daphnia 1	11 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 fish 2	23 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus)
Pentane (109-66-0)	
LC50 fish 1	9.87 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)
EC50 Daphnia 1	9.74 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 fish 2	11.59 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
Isoprene (78-79-5)	
LC50 fish 1	32.5 - 50.15 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])
EC50 Daphnia 1	140 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 fish 2	58.75 - 95.32 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])

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12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

Piperylene (102110-15-6)	
Log Pow	2.44
Bioaccumulative potential	The product presents low bioaccumulative potential in aquatic organisms. Not established.
2-Methyl-2-butene (513-35-9)	
BCF fish 1	(low potential to bioaccumulate)
Cyclopentane (287-92-3)	
Log Pow	2.05
Dicyclopentadiene (77-73-6)	
BCF fish 1	53
Log Pow	2.89
Pentane (109-66-0)	
Log Pow	3.39
Isoprene (78-79-5)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	3.2 - 4.5 (at 20 °C)

12.4. Mobility in soil

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

12.5. Other adverse effects

Other adverse effects	: No information available.
Effect on ozone layer	: No additional information available
Effect on the global warming	: No additional information available
Other information	: Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods	: Incineration. Dispose of contents/container to industrial incineration plant. Dispose of this material and its container to hazardous or special waste collection point.
Waste disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations.
Additional information	: WARNING-Do not refill!. Handle empty containers with care because residual vapours are flammable.
Ecology - waste materials	: Avoid release to the environment. Hazardous waste due to toxicity.

SECTION 14: Transport information

Classification for LAND transport: DOT

UN Number	: UN1268
Proper Shipping Name	: Petroleum distillates, n.o.s. (trans-1,3-Pentadiene, cis-1,3-Pentadiene)
Class / Division	: 3
Packing group	: II
Reportable quantity	: Not applicable

Classification for SEA transport: IMO - IMDG

UN Number	: UN1268
Proper Shipping Name	: PETROLEUM DISTILLATES, N.O.S. (trans-1,3-Pentadiene, cis-1,3-Pentadiene)
Class	: 3
Packing group	: II
Marine pollutant	: Product is considered marine pollutant based on available data

Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code:

Product name	: 1,3-PENTADIENE
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Classification for AIR transport: IATA - ICAO

UN Number	: UN1268
Proper Shipping Name	: Petroleum distillates, n.o.s. (trans-1,3-Pentadiene, cis-1,3-Pentadiene)
Class	: 3
Packing group	: II

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product and it should not be considered exhaustive. Consult US DOT, IMDG and IATA regulations before transporting the product. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15: Regulatory information

15.1. US Federal regulations

Trans-1,3 pentadiene (2004-70-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
1,3-Pentadiene, (Z)- (1574-41-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Cyclopentene (142-29-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
2-Methyl-2-butene (513-35-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Cyclopentane (287-92-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Cyclopentadiene (542-92-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	S - S - indicates a substance that is identified in a proposed or final Significant New Uses Rule
Dicyclopentadiene (77-73-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Subject to reporting requirements of United States SARA Section 313	
EPA TSCA Regulatory Flag	T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA
SARA Section 313 - Emission Reporting	1.0 %
Pentane (109-66-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA
Isoprene (78-79-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	0.1 %

15.2. International regulations

CANADA

Trans-1,3 pentadiene (2004-70-8)	
Listed on the Canadian DSL (Domestic Substances List)	
1,3-Pentadiene, (Z)- (1574-41-0)	
Listed on the Canadian NDSL (Non-Domestic Substances List)	
Cyclopentene (142-29-0)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 2 - Flammable Liquid Class D Division 2 Subdivision B - Toxic material causing other toxic effects
2-Methyl-2-butene (513-35-9)	
Listed on the Canadian DSL (Domestic Substances List)	
Cyclopentane (287-92-3)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 2 - Flammable Liquid

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Cyclopentadiene (542-92-7)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class F - Dangerously Reactive Material
Dicyclopentadiene (77-73-6)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 2 - Flammable Liquid Class D Division 1 Subdivision B - Toxic material causing immediate and serious toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects
Pentane (109-66-0)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 2 - Flammable Liquid
Isoprene (78-79-5)	
Listed on the Canadian DSL (Domestic Substances List)	

EU-Regulations

Piperylene (102110-15-6)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	
Trans-1,3 pentadiene (2004-70-8)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	
1,3-Pentadiene, (Z)- (1574-41-0)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	
Cyclopentene (142-29-0)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	
2-Methyl-2-butene (513-35-9)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	
Cyclopentane (287-92-3)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	
Cyclopentadiene (542-92-7)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	
Dicyclopentadiene (77-73-6)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	
Pentane (109-66-0)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	
Isoprene (78-79-5)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	
Piperylene (102110-15-6)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	

15.2.2. National regulations

Piperylene (102110-15-6)	
Listed on the Korean ECL (Existing Chemicals List)	
Trans-1,3 pentadiene (2004-70-8)	
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)	
1,3-Pentadiene, (Z)- (1574-41-0)	
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)	

Piperylene

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according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

Cyclopentene (142-29-0)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican national Inventory of Chemical Substances)

2-Methyl-2-butene (513-35-9)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican national Inventory of Chemical Substances)

Cyclopentane (287-92-3)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican national Inventory of Chemical Substances)
Listed on CICR (Turkish Inventory and Control of Chemicals)

Cyclopentadiene (542-92-7)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican national Inventory of Chemical Substances)

Dicyclopentadiene (77-73-6)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Japanese Pollutant Release and Transfer Register Law (PRTR Law)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican national Inventory of Chemical Substances)
Listed on CICR (Turkish Inventory and Control of Chemicals)

Pentane (109-66-0)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican national Inventory of Chemical Substances)
Listed on CICR (Turkish Inventory and Control of Chemicals)

Piperylene

Safety Data Sheet

according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

Isoprene (78-79-5)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Japanese Pollutant Release and Transfer Register Law (PRTR Law)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican national Inventory of Chemical Substances)

Piperylene (102110-15-6)

Listed on the Korean ECL (Existing Chemicals List)

15.3. US State regulations

Isoprene (78-79-5)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
Yes	No	No	No	

SECTION 16: Other information

Indication of changes : 3. Composition/information on ingredients. 9. Physical and chemical properties.
Revision date : 12/18/2015
Sources of Key data : Data arise from reference works and literature.
Abbreviations and acronyms : ACGIH - American Conference of Government Industrial Hygienists
ASTM - American Society for Testing and Materials
Other information : None.

Full text of H-statements:

-----	H224	Extremely flammable liquid and vapour
-----	H225	Highly flammable liquid and vapour
-----	H226	Flammable liquid and vapour
-----	H301	Toxic if swallowed
-----	H302	Harmful if swallowed
-----	H304	May be fatal if swallowed and enters airways
-----	H311	Toxic in contact with skin
-----	H312	Harmful in contact with skin
-----	H315	Causes skin irritation
-----	H319	Causes serious eye irritation
-----	H332	Harmful if inhaled
-----	H335	May cause respiratory irritation
-----	H336	May cause drowsiness or dizziness
-----	H340	May cause genetic defects
-----	H341	Suspected of causing genetic defects
-----	H350	May cause cancer
-----	H351	Suspected of causing cancer

Braskem - SDS US

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.