

PENTENE-1

Version: 4.04

Revision Date 20.08.2015

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**1.1 Product identifier**

Trade name	Pentene-1
REACH No.	01-2119487483-28-0001
Substance name (REACH / CLP)	pent-1-ene

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

Use	Industrial use raw material for synthesis processes in the chemical industry
Uses advised against	The substance / product is to be under strictly controlled conditions, as defined in Article 18 (4) of Regulation (EC) No 1907/2006 (REACH) registered, and must be treated accordingly (SCC).

1.3 Details of the supplier of the safety data sheet

Company	SASOL Germany GmbH Anckelmannsplatz 1 20537 Hamburg Telephone: +49 40 63684-1000 Telefax: +49 40 63684-3700
Information (Product safety):	Telephone: + 49 (0) 23 65 - 49 47 05 Telefax: + 49 (0) 23 65 - 49 92 40
E-mail address	solvents.germany.msds@de.sasol.com

1.4 Emergency telephone number

Emergency telephone number	+44 (0)1235 239 670 (Europe, Israel, Africa, Americas) +44 (0)1235 239 671 (Middle East, Arabic African countries) +65 3158 1074 (Asia Pacific) +86 10 5100 3039 (China) +27 (0)17 610 4444 (South Africa) +61 (2)8014 4558 (Australia)
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SECTION 2: HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****Classification (REGULATION (EC) No 1272/2008)**

Flammable liquids Category 1	Extremely flammable liquid and vapour.
Aspiration hazard Category 1	May be fatal if swallowed and enters airways.
Chronic aquatic toxicity Category 3	Harmful to aquatic life with long lasting effects.

2.2 Label elements**Labelling (REGULATION (EC) No 1272/2008)**

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Hazard pictograms**Signal word**

Danger

Hazard statements

H224

Extremely flammable liquid and vapour.

H304

May be fatal if swallowed and enters airways.

H412

Harmful to aquatic life with long lasting effects.

Precautionary statements

P210

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P243

Take precautionary measures against static discharge.

P301 + P310

IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.

P331

Do NOT induce vomiting.

P403 + P235

Store in a well-ventilated place. Keep cool.

P273

Avoid release to the environment.

P241

Use explosion-proof electrical/ ventilating/ lighting/ equipment.

Supplemental Hazard Statements

EUH066

Repeated exposure may cause skin dryness or cracking.

2.3 Other hazards

No information available.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

This product is a substance in the meaning of regulation (EC) 1907/2006.

COMPONENTS TO BE NAMED IN ACCORDANCE WITH REGULATION (EC) 1907/2006 AS WELL AS OTHER HAZARDOUS INGREDIENTS AND CONTAINED SUBSTANCES WITH WORK PLACE LIMIT VALUES**Pent-1-ene****content:** 100 %**component type:** Active ingredient**EC-No.:** 203-694-5**Index-No.:****CAS-No.:** 109-67-1**REACH No.:** 01-2119487483-28-0001, 01-2119487483-28-0000**Classification (Regulation
(EC) No 1272/2008):**

Flam. Liq. 1

H224

Asp. Tox. 1

H304

Aquatic Chronic

3

H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

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SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General advice	Take off contaminated clothing and shoes immediately.
If inhaled	Bring the person into the fresh air and let rest undisturbed. Monitor breathing, give oxygen if necessary. Call a physician immediately.
In case of skin contact	Wash off immediately with plenty of water. If skin irritation persists, call a physician.
In case of eye contact	In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Seek medical advice.
If swallowed	Do NOT induce vomiting. If a person vomits when lying on his back, place him in the recovery position. Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed

Most important symptoms and effects, both acute and delayed	Risks: irritant effects Risk of serious damage to the lungs (by aspiration).
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4.3 Indication of any immediate medical attention and special treatment needed

Indication of any immediate medical attention and special treatment needed	Treatment: For specialist advice physicians should contact the Poisons Information Service.
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SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media	Dry powder, Carbon dioxide (CO ₂), Water spray, Alcohol-resistant foam
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5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting	Dangerous gases or fumes may occur in case of fire.
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5.3 Advice for firefighters

Special protective equipment for firefighters	In the event of fire, wear self-contained breathing apparatus.
Further information	Cool containers/tanks with water spray.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	Ensure adequate ventilation. Do not breathe vapours or spray mist. Keep away from sources of ignition - No smoking.
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6.2 Environmental precautions

Environmental precautions	Do not allow material to contaminate ground water system. Do not flush into surface water or sanitary sewer system.
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6.3 Methods and materials for containment and cleaning up

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Methods for cleaning up

Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). The material taken up must be disposed of in accordance with regulations.

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: HANDLING AND STORAGE**7.1 Precautions for safe handling****Advice on safe handling**

Vapours are heavier than air and may spread along floors.
Ensure adequate ventilation.
Avoid formation of aerosol.
Keep away from sources of ignition - No smoking.

Advice on protection against fire and explosion

Do not allow to enter drains (danger of explosion).
Keep away from sources of ignition - No smoking.
Use only explosion-proof equipment.
Take precautionary measures against static discharges.
Vapours may form explosive mixtures with air.

Temperature class

T3

Fire-fighting class

B: Fires involving liquids or liquid containing substances. Also includes substances which become liquid at elevated temperatures.

7.2 Conditions for safe storage, including any incompatibilities**Requirements for storage areas and containers**

Keep tightly closed in a dry, cool and well-ventilated place. Protect against light.

Advice on common storage

Keep away from oxidising agents and strongly acid or alkaline materials.

Storage class (TRGS 510)

3: Flammable Liquids

container material

suitable materials: Stainless steel

7.3 Specific end use(s)**Specific use(s)**

Consult the technical guidelines for the use of this substance/mixture.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**8.1 Control parameters****COMPONENTS WITH WORKPLACE CONTROL PARAMETERS****National occupational exposure limits**

No data available

EUROPEAN OCCUPATIONAL EXPOSURE LIMITS

No data available

8.2 Exposure controls**PERSONAL PROTECTIVE EQUIPMENT**

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Respiratory protection	In inadequately ventilated areas, where workplace limits are exceeded, where unpleasant odours exist or where aerosols are in use, or smoke and mist occur, use self-contained breathing apparatus or breathing apparatus with a type AX filter or appropriate combined filter (e.g. where aerosols are in use, or smoke and mist occur, AX-P2 or AX-P3), in compliance with EN 371.
Hand protection	<p>The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other., Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time., Be aware that in daily use the durability of a chemical resistant protective glove can be notably shorter than the break through time measured according to EN 374, due to the numerous outside influences (e.g. temperature).</p> <p>gloves suitable for permanent contact: Material: Fluorinated rubber Break through time: ≥ 480 min Layer thickness: 0,4 mm</p> <p>Material: Nitrile rubber/nitrile latex Break through time: ≥ 480 min Layer thickness: 0,35 mm</p> <p>unsuitable gloves Material: Natural rubber/natural latex, Polychloroprene, butyl-rubber</p>
Eye protection	Tightly fitting safety goggles
Skin and body protection	Rubber or plastic apron
Hygiene measures	Take off all contaminated clothing immediately.
Protective measures	Do not breathe vapours or spray mist. Avoid contact with the skin and the eyes.

ENVIRONMENTAL EXPOSURE CONTROLS

General advice	Do not allow material to contaminate ground water system. Do not flush into surface water or sanitary sewer system.
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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**9.1 Information on basic physical and chemical properties**

Physical state	liquid; 20 °C; 1.013 hPa
Form	liquid
Colour	colourless
Odour	hydrocarbon-like
Odour Threshold	No valid method available
pH	Not applicable
Melting point/range	-165 °C
Boiling point/boiling range	29,9 °C; 1.013 hPa

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Flash point	-51 °C; closed cup
Evaporation rate	No data available
Flammability (solid, gas)	not applicable (liquid)
Lower explosion limit	1,4 %(V)
Upper explosion limit	9 %(V)
Vapour pressure	708 hPa; 20 °C
Relative vapour density	2,4
Density	0,65 g/cm ³ ; 20 °C
Solubility/qualitative	miscible with most organic solvents
Water solubility	0,148 g/l; 20 °C
Partition coefficient: n-octanol/water	Pow: 2,66
Ignition temperature	265 °C
Viscosity, dynamic	0,202 mPas; 20 °C
Viscosity, kinematic	0,325 mm ² /s; 20 °C 0,304 mm ² /s; 30 °C
Explosive properties	Not explosive; Not explosive
Oxidizing properties	No data available

9.2 Other data

None known.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Note Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions.

10.2 Chemical stability

Note No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions Vapours may form explosive mixture with air.

10.4 Conditions to avoid

Conditions to avoid Heat, flames and sparks.

10.5 Incompatible materials to avoid

Materials to avoid Oxidizing agents; Acids

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. No decomposition if stored and applied as directed.

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Thermal decomposition

No decomposition if used as directed.
Distills without decomposition at atmospheric pressure.

SECTION 11: TOXICOLOGICAL INFORMATION**11.1 Information on toxicological effects****Acute toxicity****Acute oral toxicity**

Pent-1-ene:
LD50 Rat: > 2.000 mg/kg
(literature value)
Based on available data, the classification criteria are not met.

Acute inhalation toxicity

Pent-1-ene:
No data available

Acute dermal toxicity

Pent-1-ene:
LD50 Rabbit: > 2.000 mg/kg;
(literature value)
Category approach
Based on available data, the classification criteria are not met.

Skin corrosion/irritation**Skin irritation**

Pent-1-ene:
Rabbit: not irritating
(literature value)
Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation**Eye irritation**

Pent-1-ene:
Rabbit: not irritating
(literature value)
Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation**Sensitisation**

Pent-1-ene:
Mouse local lymphnode assay Mouse: not sensitizing; OECD Test Guideline 429
(literature value)
Based on available data, the classification criteria are not met.

Germ cell mutagenicity**Genotoxicity in vitro**

Pent-1-ene:
Ames test; Salmonella typhimurium; with and without metabolic activation: not
mutagenic
(literature value)

Remarks

Pent-1-ene:
Based on available data, the classification criteria are not met.

Carcinogenicity**Carcinogenicity**

Pent-1-ene:
This information is not available.

Reproductive toxicity**Reproductive toxicity**

Pent-1-ene:
This information is not available.

Teratogenicity

Pent-1-ene:

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This information is not available.

STOT - single exposure**Remarks**

Pent-1-ene:
The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT - repeated exposure**Repeated dose toxicity**

Pent-1-ene:

This information is not available.

Aspiration hazard**Aspiration toxicity**

Pent-1-ene:
May be fatal if swallowed and enters airways.

SECTION 12: ECOLOGICAL INFORMATION**12.1 Toxicity****Toxicity to fish**

Pent-1-ene:
No data available

Toxicity to daphnia and other aquatic invertebrates

Pent-1-ene:
EC50 (48 h) Daphnia magna (Water flea): > 10 - 100 mg/l ; static test; OECD Test Guideline 202 (literature value)

Toxicity to aquatic plants

Pent-1-ene:
EC50 (72 h) Desmodesmus subspicatus (green algae): > 10 - 100 mg/l ; Growth rate; static test; OECD Test Guideline 201; (literature value)

12.2 Persistence and degradability**Biodegradability**

Pent-1-ene:
Not readily biodegradable.; < 60 %; 28 d; aerobic (literature value)

12.3 Bioaccumulative potential**Bioaccumulation**

Pent-1-ene:
No data available

12.4 Mobility in soil**Mobility**

Pent-1-ene:
No data available

12.5 Results of PBT and vPvB assessment**Results of PBT assessment**

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Results of PBT assessment

Pent-1-ene:
Based on available data, the classification criteria are not met.

12.6 Other adverse effects

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General advice

Pent-1-ene:
Harmful to aquatic life with long lasting effects.

SECTION 13: DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods****Product**

Following pre-treatment and observing the regulations for hazardous wastes, it must be taken to a permitted hazardous wastes landfill or hazardous wastes incinerator.

Contaminated packaging

Contaminated packaging should be emptied optimally and after being suitably cleaned returned for re-use.

waste code of the European Union: EWC

A waste code in accordance with the European Waste Catalogue (EWC) may not be assigned to this product since it admits of a classification only when the consumer uses it for some purpose.

SECTION 14: TRANSPORT INFORMATION**14.1 UN number**

ADR	1108
RID	1108
ADN	1108
IMDG	1108
ICAO/IATA	1108

14.2 Proper shipping name

ADR	1-PENTENE
RID	1-PENTENE
ADN	1-PENTENE
IMDG	1-PENTENE
ICAO/IATA	1-PENTENE

14.3 Transport hazard class

ADR	3
RID	3
ADN	3
IMDG	3
ICAO/IATA	3

14.4 Packing group

ADR	I
RID	I
ADN	I
IMDG	I
ICAO/IATA	I

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14.5 Environmental hazards

ADR	Environmentally hazardous	no
RID	Environmentally hazardous	no
ADN	Environmentally hazardous	no
IMDG	Marine pollutant	no
ICAO/IATA	Environmentally hazardous	no

14.6 Special precautions for user

ADR	Hazard Identification Number	33
	Labels	3
	Tunnel restriction code	(D/E)
IMDG	Labels	3
	EmS Number 1	F-E
	EmS Number 2	S-D
ICAO/IATA	Labels	3

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

Ship type	3
Pollution category	Y

SECTION 15: REGULATORY INFORMATION**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****EU REGULATIONS /INTERNATIONAL REGULATIONS****DEA: US. Drug Enforcement Administration (DEA) Listed Precursor and Essential Chemicals (21 CFR 1310)**

Neither banned nor restricted

Occupational restrictions	Employment restrictions for children and young workers in accordance with Directive 94/33/EC and the respective national provisions are to be observed. Employment restrictions for pregnant workers, workers who have recently given birth and nursing mothers in accordance with Directive 92/85/EEC and the respective national provisions are to be observed.
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Occupational restrictions	Employment restrictions for children and young workers in accordance with Directive 94/33/EC and the respective national provisions are to be observed.
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NATIONAL/OTHER REGULATIONS

Legislation on the control of major-accident hazards involving dangerous substances	Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. list entry in the directive:: FLAMMABLE LIQUIDS; P5a Qualifying quantity 1: 10 t; Qualifying quantity 2: 50 t;
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NOTIFICATION STATUS

Switzerland. Consolidated Inventory	CH INV	listed (product or constituents are listed)
US. Toxic Substances Control Act	TSCA	listed (product or constituents are listed)
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL)	DSL	listed (product or constituents are listed)
Australia. Industrial Chemical (Notification and Assessment) Act	AICS	listed (product or constituents are listed)
Japan. Kashin-Hou Law List	ENCS (JP)	listed (product or constituents are listed)
Japan. Industrial Safety & Health Law (ISHL) List	ISHL (JP)	listed (product or constituents are listed)
Korea. Existing Chemicals Inventory (KECI)	KECI (KR)	listed (product or constituents are listed)
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	PICCS (PH)	listed (product or constituents are listed)
China. Inventory of Existing Chemical Substances	INV (CN)	listed (product or constituents are listed)

Please note: the names and CAS numbers which are used for this product in the stated inventories may deviate from the information which is listed in chapter 3.

15.2 Chemical Safety Assessment**Pent-1-ene**

A Chemical Safety Assessment is not required for this substance.

SECTION 16: OTHER INFORMATION**Full text of H-Statements referred to under sections 2 and 3.**

H224	Extremely flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H412	Harmful to aquatic life with long lasting effects.

Safety datasheet sections which have been updated:

2. Hazards identification

Recommended restrictions on use:

The substance / product is to be under strictly controlled conditions, as defined in Article 18 (4) of Regulation (EC) No 1907/2006 (REACH) registered, and must be treated accordingly (SCC).

Further information:

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material

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designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
This safety datasheet only contains information relating to safety and does not replace any product information or product specification.

Key or legend to abbreviations and acronyms used in the safety data sheet

ADN	Accord européen relatif au transport international des marchandises dangereuses par voie de navigation intérieure
ADR	Accord européen relatif au transport international des marchandises Dangereuses par Route
AICS	Australian Inventory of Chemical Substances
ANSI	American National Standards Institute
ASTM	American Society of Testing and Materials (US)
BCF	Bioconcentration factor
CLP	Regulation on Classification, Labelling and Packaging of Substances and Mixtures
DIN	Deutsches Institut für Normung
DNEL	Derived No-Effect Level
DSL	Domestic Substances List
EC...	Effect concentration ... %
ENCS	Existing Notified Chemical Substances (Japan)
EWG	European Waste Catalogue
IATA	International Air Transport Association
IBC	Intermediate Bulk Container
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
ISHL	Industrial Safety and Health Law (Japan)
ISO	International Organization for Standardization
IUAPC	International Union of Pure and Applied Chemistry
KECI	Korea Existing Chemicals Inventory
LC...	Lethal Concentration, ...%
LD...	Lethal Dose, ...%
MARPOL	International Convention for the Prevention of Pollution From Ships
NDSL	Non-Domestic Substances List
NOAEL	no observable adverse effect level
NOEL/NOEC	No Observed-effect level/concentration
NZIoC	New Zealand Inventory of Chemicals
OECD	Organisation for Economic Co-operation and Development
PBT	persistent, bioaccumulative, toxic
PICCS	Philippine Inventory of Chemicals and Chemical Substances
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport international ferroviaire de marchandises dangereuses
TG	Test Guideline
TRGS	Technische Regeln für Gefahrstoffe
TSCA	Toxic Substances Control Act
vPvB	very persistent, very bioaccumulative
WGK	Wassergefährdungsklasse