SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Isopentane

Issue Date: Revision Date: Last revised date :	31.07.2013 18.03.2024 -	Version: 1.0	SDS No.: 000010021944 1/23

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

1.1 Product identifier

Product name: Isopentane

Additional identification

Chemical name:	2-Methylbutane
Chemical formula:	C5H12
INDEX No.	601-085-00-2
CAS-No.	78-78-4
EC No.	201-142-8
REACH Registration No.	01-2119475602-38

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

Identified uses: Industrial and professional. Perform risk assessment prior to use.
Uses advised against Consumer use.

1.3 Details of the supplier of the safety data sheet

Supplier

Linde Gas A/S
Lautruphøj 2-6
2750 Ballerup

Telephone: +4532836600

E-mail: sds.ren@linde.com

1.4 Emergency telephone number: Poison control hotline: tel. +45 82 12 12 12

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 as amended.

Physical Hazards

Flammable liquids	Category 1	H224: Extremely flammable liquid and vapor.

Health Hazards

Specific Target Organ Toxicity - Single Exposure	Category 3	H336: May cause drowsiness or dizziness.
Aspiration Hazard	Category 1	H304: May be fatal if swallowed and enters airways.

Environmental Hazards

Chronic hazards to the aquatic environment	Category 2	H411: Toxic to aquatic life with long lasting effects.

2.2 Label Elements

Signal Word: Danger

Hazard Statement(s):
H224: Extremely flammable liquid and vapor.
H336: May cause drowsiness or dizziness.
H304: May be fatal if swallowed and enters airways.
H411: Toxic to aquatic life with long lasting effects.

Precautionary Statements

General None.

Prevention:
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof electrical, ventilating and lighting equipment.
P242: Use non-sparking tools.
P243: Take action to prevent static discharges.
P261: Avoid breathing dust/fume/gas/mist/vapors/spray.
P273: Avoid release to the environment.

Response:

P301+P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P331: Do NOT induce vomiting.
P312: Call a POISON CENTER or doctor/ physician if you feel unwell.
P370 + P378: In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P391: Collect spillage.

Storage:

P403+P235: Store in a well-ventilated place. Keep cool.

Disposal

None.

2.3 Other hazards

Not classified as PBT or vPvB.

Endocrine disrupting properties-Toxicity

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Endocrine disrupting properties-Ecotoxicity

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

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SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name 2-Methylbutane
INDEX No.: 601-085-00-2
CAS-No.: 78-78-4
EC No.: 201-142-8
REACH Registration No.: 01-2119475602-38
Purity: 100%
The purity of the substance in this section is used for classification only, and does not represent the actual purity of the substance as supplied, for which other documentation should be consulted.
Trade name: -

Chemical name	Chemical formula	Concentration	CAS-No.	EC No.	REACH Registration No.	M-Factor:	Notes
2-Methylbutane	C5H12	100%	78-78-4	201-142-8	01-2119475602-38	-	#

The concentrations of the components in the SDS header, product name on page one and in section 3.2 are in mol due to regulatory requirements. All concentrations are nominal.
This substance has workplace exposure limit(s).
This substance is listed as SVHC.PBT: persistent, bioaccumulative and toxic substance.
vPvB: very persistent and very bioaccumulative substance.

SECTION 4: First aid measures

General: Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

4.1 Description of first aid measures

Inhalation: Move the exposed person to fresh air at once. If breathing stops, provide artificial respiration. Symptoms may include: Dizziness. Nausea, vomiting.

Eye contact: Flush thoroughly with water for at least 15 minutes. Get medical assistance.

Skin Contact: Promptly flush contaminated skin with soap or mild detergent and water. Promptly remove clothing if penetrated and flush the skin with water.

Ingestion: Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs. Get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed: Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other severe central nervous system effects. Repeated exposure may cause skin dryness or cracking.

4.3 Indication of any immediate medical attention and special treatment needed

Hazards: Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other severe central nervous system effects. Repeated exposure may cause skin dryness or cracking.

Treatment: Do not give direct mouth-to-mouth resuscitation if swallowed. To protect rescuer, use air-viva, oxy-viva or one-way mask. Resuscitate in a well-ventilated area. If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

SECTION 5: Firefighting measures

General Fire Hazards: Heat may cause the containers to explode.

5.1 Extinguishing media

Suitable extinguishing media: Water Spray or Fog. Dry powder. Foam. Carbon Dioxide.

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

5.2 Special hazards arising from the substance or mixture: Flammable liquid. Closed containers may rupture violently when heated. Vapors are heavier than air and may travel to a source of ignition and flash back. Liquid floats on water and may travel to a source of ignition and spread fire. Incomplete combustion may form carbon monoxide

Hazardous Combustion Products: Carbon oxides

5.3 Advice for firefighters

Special fire-fighting procedures:	In case of fire: Stop leak if safe to do so. Do not extinguish flames at leak because possibility of uncontrolled explosive reignition exists. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate the source of the fire or let it burn out. Prevent runoff from entering drains, sewers, or streams.
Special protective equipment for fire-fighters:	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Guideline: EN 469 Protective clothing for firefighters. Performance requirements for protective clothing for firefighting. EN 15090 Footwear for firefighters. EN 659 Protective gloves for firefighters. EN 443 Helmets for fire fighting in buildings and other structures. EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures:	Evacuate area. Provide adequate ventilation. Consider the risk of potentially explosive atmospheres . In case of leakage, eliminate all ignition sources. Monitor the concentration of the released product. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.
6.2 Environmental Precautions:	Prevent further leakage or spillage if safe to do so.
6.3 Methods and material for containment and cleaning up:	Provide adequate ventilation. Eliminate sources of ignition. Absorb spillage with non-combustible, absorbent material. Collect and reclaim or dispose in sealed containers at licensed waste disposal site.
6.4 Reference to other sections:	Refer to sections 8 and 13.

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SECTION 7: Handling and storage:

7.1 Precautions for safe handling:

Do not handle until all safety precautions have been read and understood. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Purge system with dry inert gas (e.g. helium or nitrogen) before product is introduced and when system is placed out of service. Containers, which contain or have contained flammable or explosive substances, must not be inerted with liquid carbon dioxide. Assess the risk of a potentially explosive atmosphere and the need for suitable equipment i.e. explosion-proof. Take precautionary measures against static discharges. Keep away from ignition sources (including static discharges). Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres. Use non-sparking tools. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Ensure the complete system has been (or is regularly) checked for leaks before use. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Provide adequate ventilation. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Avoid suckback of water, acid and alkalis. Keep container below 50°C in a well ventilated place. Observe all regulations and local requirements regarding storage of containers. When using do not eat, drink or smoke. Store in accordance with local/regional/national/international regulations. Never use direct flame or electrical heating devices to raise the pressure of a container. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Close container valve after each use and when empty, even if still connected to equipment.

7.2 Conditions for safe storage, including any incompatibilities:

All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere. Segregate from oxidant gases and other oxidants being stored. Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible material.

7.3 Specific end use(s):

None.

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SECTION 8: Exposure controls/personal protection

8.1 Control Parameters

Occupational Exposure Limits

Chemical name	Type	Form of exposure	Exposure Limit Values	Source
isopentane; 2-methylbutane	GV		500 ppm 1.500 mg/m3	Denmark. Work Environment Authority. Exposure Limits for Substances & Materials, An. 2 & 3, as amended (03 2008)
	TWA		1.000 ppm 3.000 mg/m3	EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended (12 2009)

Please refer to the latest edition of the appropriate source text and consult an industrial hygienist or similar professional, or local agencies, for further information.

Biological Limit Values

No biological exposure limits noted for the ingredient(s).

DNEL-Values

Critical component	Type	Value	Remarks
2-Methylbutane	Workers - Dermal, Systemic, long-term	432 mg/kg bw/day	Repeated dose toxicity
	Workers - Inhalation, Systemic, long-term	3000 mg/m3	Repeated dose toxicity
2-Methylbutane	Workers - Dermal, Systemic, long-term	432 mg/kg bw/day	Repeated dose toxicity
	Workers - Inhalation, Systemic, long-term	3000 mg/m3	Repeated dose toxicity

8.2 Exposure controls

Appropriate engineering controls:

Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Provide adequate general and local exhaust ventilation. Keep concentrations well below lower explosion limits. Gas detectors should be used when quantities of flammable gases or vapours may be released. Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Systems under pressure should be regularly checked for leakages. Product to be handled in a closed system. Only use permanent leak tight installations (e.g. welded pipes). Take precautionary measures against static discharges.

Individual protection measures, such as personal protective equipment

General information:

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Keep self contained breathing apparatus readily available for emergency use. Personal protective equipment for the body should be selected based on the task being performed and the risks involved. For waste disposal, see section 13 of the SDS. Do not eat, drink or smoke when using the product.

Eye/face protection:

Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases. Guideline: EN 166 Personal Eye Protection.

Skin protection

Hand Protection:

Guideline: EN 388 Protective gloves against mechanical risks.
Additional Information: Wear working gloves while handling containers
Material: Nitrile.
Guideline: EN 374-1/2/3 Protective gloves against chemicals and micro-organisms.
Additional Information: Chemically resistant gloves complying with EN 374 should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection:

Wear fire resistant or flame retardant clothing.
Guideline: ISO/TR 2801:2007 Clothing for protection against heat and flame -- General recommendations for selection, care and use of protective clothing.

Other:	Wear safety shoes while handling containers Guideline: ISO 20345 Personal protective equipment - Safety footwear.
Respiratory Protection:	Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances. The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD. Guideline: EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.Material: Filter AX Guideline: EN 14387 Respiratory protective devices. Gas filter(s) and combined filter(s). Requirements, testing, marking. Guideline: EN 136 Respiratory protective devices. Full face masks. Requirements, testing, marking.
Thermal hazards:	No precautionary measures are necessary.
Hygiene measures:	Specific risk management measures are not required beyond good industrial hygiene and safety procedures. Do not eat, drink or smoke when using the product.
Environmental exposure controls:	For waste disposal, see section 13 of the SDS.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state:	liquid
Form:	Liquefied gas
Color:	Colorless
Odor:	Faint
Odor Threshold:	Odor threshold is subjective and is inadequate to warn of over exposure.
Freezing point:	-255,59 °F/-159,77 °C Experimental result, Key study

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Boiling Point: 82,0 °F/27,8 °C (101,325 kPa)

Flammability: This product is not flammable.

Upper/lower limit on flammability or explosive limits

Explosive limit - upper: 7,6 %(V) Experimental result, Key study

Explosive limit - lower: 1,4 %(V)

Flash Point: -60 °F/-51 °C

Autoignition Temperature: 420 °C Experimental result, Key study

Decomposition Temperature: Not known.

pH: Not applicable

Viscosity

Dynamic viscosity: 0,214 mPa.s (77 °F/25 °C) Experimental result, Key study

Kinematic viscosity: No data available.

Solubility(ies)

Solubility in Water: 48 mg/l (77 °F/25 °C)

Solubility (other): No data available.

Partition coefficient (n-octanol/water): 2,30

Dispersion Stability: No data available.

Vapor pressure: 100 kPa (81,5 °F/27,5 °C) Experimental result, Key study

Relative density: 0,6201 (68 °F/20 °C)

Density: 0,62 g/cm3 (68 °F/20 °C)

Relative vapor density: No data available.

Particle characteristics: Not applicable

9.2 Other information

Flammability: Tci: 2,1

Minimum ignition energy: 0,21 mJ

Molecular weight: 72,15 g/mol (C5H12)

VOC Content: EC Directive 2004/42: 620 g/l ~100 % (calculated)
EU. Directive 2010/75/EU on Industrial Emissions (IPPC), Annex II, L 334/17: 0 % (calculated)

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SECTION 10: Stability and reactivity

10.1 Reactivity: No reactivity hazard other than the effects described in sub-section below.

10.2 Chemical Stability: Stable under normal conditions.

10.3 Possibility of hazardous reactions: Can form a potentially explosive atmosphere in air. May react violently with oxidants.

10.4 Conditions to avoid: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

10.5 Incompatible Materials: Air and oxidizers.

10.6 Hazardous Decomposition Products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

General information: None.

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity - Oral

Product Based on available data, the classification criteria are not met.

2-Methylbutane LD 50 (Rat): > 2.000 mg/kg Remarks: Read-across based on grouping of substances (category approach), Key study

Acute toxicity - Dermal

Product Based on available data, the classification criteria are not met.

Acute toxicity - Inhalation

Product Based on available data, the classification criteria are not met.

2-Methylbutane LC 50 (Rat, 4 h): > 25,3 mg/l Remarks: Vapor Read-across based on grouping of

substances (category approach), Key study

Repeated dose toxicity

2-Methylbutane — NOAEL (Rat(Female, Male), Inhalation, 13 Weeks): > 2.220 ppm(m) Inhalation Experimental result, Key study

Skin Corrosion/Irritation

Product — Based on available data, the classification criteria are not met.

2-Methylbutane — in vivo (Rabbit): Not classified as an Irritant Read-across based on grouping of substances (category approach), Key study

Serious Eye Damage/Eye Irritation

Product — Based on available data, the classification criteria are not met.

2-Methylbutane — in vivo (Rabbit, 24 hrs): Not irritatingOECD GHS

Respiratory or Skin Sensitization

Product — Based on available data, the classification criteria are not met.

Germ Cell Mutagenicity

Product — Based on available data, the classification criteria are not met.

Carcinogenicity

Product — Based on available data, the classification criteria are not met.

Reproductive toxicity

Product — Based on available data, the classification criteria are not met.

Specific Target Organ Toxicity - Single Exposure

Product — May cause drowsiness or dizziness.

Specific Target Organ Toxicity - Repeated Exposure

Product — Based on available data, the classification criteria are not met.

Aspiration Hazard
Product May be fatal if swallowed and enters airways.

11.2 Information on other hazards

Endocrine disrupting properties
Product: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Components:
2-Methylbutane The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.;

Other information
Product: No data available.

SECTION 12: Ecological information

General information: Avoid release to the environment. Product is not allowed to be discharged into ground water or the aquatic environment. Not applicable

12.1 Toxicity

Acute toxicity
Product Toxic to aquatic life with long lasting effects.

Acute toxicity - Fish
2-Methylbutane LL 50 (Oncorhynchus mykiss, 96 h): 34,05 mg/l (QSAR) Remarks: QSAR QSAR, Key study

Acute toxicity - Aquatic Invertebrates
2-Methylbutane EC 50 (Daphnia magna, 48 h): 59,44 mg/l (QSAR) Remarks: QSAR QSAR, Key study

Chronic Toxicity - Fish
2-Methylbutane NOAEL (Oncorhynchus mykiss): 7,618 mg/l (QSAR) QSAR QSAR, Key study

Chronic Toxicity - Aquatic Invertebrates

2-Methylbutane	NOAEL (Daphnia magna): 13,29 mg/l (QSAR) QSAR QSAR, Key study

Toxicity to Aquatic Plants

2-Methylbutane	NOEC (Algae (Pseudokirchneriella subcapitata), 72 h): 7,51 mg/l EC 50 (Algae (Pseudokirchneriella subcapitata), 72 h): 10,7 mg/l

12.2 Persistence and Degradability

Product	Not applicable to gases and gas mixtures..

Biodegradation

Inorganic The product is not readily biodegradable.

12.3 Bioaccumulative potential

Product	The substance has no potential for bioaccumulation.

Bioconcentration Factor (BCF)

2-Methylbutane	Pimephales promelas, Bioconcentration Factor (BCF): 171 Aquatic sediment Read-across based on grouping of substances (category approach), Key study

12.4 Mobility in soil

Product	The substance has low mobility in soil.

12.5 Results of PBT and vPvB assessment

Product	Not classified as PBT or vPvB.

Global Warming Potential

Global warming potential: 5
Contains greenhouse gas(es). When discharged in large quantities may contribute to the greenhouse effect.

2-Methylbutane	EU. Non-Fluorinated Substance GWPs (Annex IV), Regulation 517/2014/EU on fluorinated greenhouse gases - Global warming potential: 5

Other Ecological Information

May cause pH changes in aqueous ecological systems. Depending on local conditions and existing concentrations, disturbances in the biodegradation process of activated sludge are possible.

12.6 Endocrine disrupting properties:

Product: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Components:

2-Methylbutane: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects:

Other hazards

Product: No data available.

Other effects:

SECTION 13: Disposal considerations

13.1 Waste treatment methods

General information: Do not discharge into any place where its accumulation could be dangerous. Consult supplier for specific recommendations. Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Disposal methods: Dispose of container via supplier only. Discharge, treatment, or disposal may be subject to national, state, or local laws.

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SECTION 14: Transport information

ADR

14.1 UN number or ID number:	UN 1265
14.2 UN Proper Shipping Name:	PENTANES
14.3 Transport Hazard Class(es)	
Class:	3
Label(s):	3
Hazard No. (ADR):	33
Tunnel restriction code:	(D/E)
14.4 Packing Group:	I
Limited quantity	None.
Excepted quantity	None.
14.5 Environmental hazards:	Environmentally Hazardous
14.6 Special precautions for user:	–

RID

14.1 UN number or ID number:	UN 1265
14.2 UN Proper Shipping Name	PENTANES
14.3 Transport Hazard Class(es)	
Class:	3
Label(s):	3
14.4 Packing Group:	I
Limited quantity	None.
Excepted quantity	None.
14.5 Environmental hazards:	Environmentally Hazardous
14.6 Special precautions for user:	–

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IMDG

14.1 UN number or ID number:	UN 1265
14.2 UN Proper Shipping Name:	PENTANES
14.3 Transport Hazard Class(es)	
Class:	3
Label(s):	3
EmS No.:	F-E, S-D
14.4 Packing Group:	I
Limited quantity	None.
Excepted quantity	None.
14.5 Environmental hazards:	Marine Pollutant
14.6 Special precautions for user:	–

IATA

14.1 UN number or ID number:	UN 1265
14.2 Proper Shipping Name:	Pentanes
14.3 Transport Hazard Class(es):	
Class:	3
Label(s):	3
14.4 Packing Group:	I
Limited quantity	None.
Excepted quantity	None.
14.5 Environmental hazards:	Environmentally Hazardous
14.6 Special precautions for user:	–
Other information	
Passenger and cargo aircraft:	Allowed.
Cargo aircraft only:	Allowed.

14.7 Maritime transport in bulk according to IMO instruments
Not applicable for product as supplied.

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Additional identification: Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured. Ensure that the container valve is closed and not leaking. Ensure adequate air ventilation.

SECTION 15: Regulatory information

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

EU Regulations

EU. REACH Annex XIV, Substances Subject to Authorization as amended: None present or none present in regulated quantities.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended: None present or none present in regulated quantities.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended: None present or none present in regulated quantities.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended: None present or none present in regulated quantities.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended: None present or none present in regulated quantities.

Regulation (EC) No. 1907/2006 Annex XVII Substances subject to restriction on marketing and use:

Chemical name	CAS-No.
2-Methylbutane	78-78-4

Directive 92/85/EEC: on the safety and health of pregnant workers and workers who have recently given birth or are breast feeding.:

Chemical name	CAS-No.	Concentration
2-Methylbutane	78-78-4	100%

EU. Directive 2012/18/EU (SEVESO III) on major accident hazards involving dangerous substances, Annex I:

Classification	Lower-tier Requirements	Upper-tier Requirements
P5a: Flammable liquids, Category 1; Flammable liquids Category 2 or 3 maintained at a temperature above their boiling point; Other liquids with a flash point ≤ 60 °C, maintained at a temperature above their boiling point	10 t	50 t
E2: Hazardous to the Aquatic Environment in Category Chronic 2	200 t	500 t

Directive 98/24/EC on the protection of workers from the risks related to chemical agents at work:

Chemical name	CAS-No.	Concentration
2-Methylbutane	78-78-4	100%

National Regulations

Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work Directive 2016/425/EEC on personal protective equipment Directive 2014/34/EU on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX) Only products that comply with the food regulations (EC) No. 1333/2008 and (EU) No. 231/2012 and are labelled as such may be used as food additives.
This Safety Data Sheet has been produced to comply with Regulation (EU) 2020/878.

15.2 Chemical safety assessment: No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

Revision Information: Not relevant.

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Abbreviations and acronyms:

ECTLV:	EU. Indicative Occupational Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU, as amended
GV (DK):	Denmark. Work Environment Authority. Exposure Limits for Substances & Materials, An. 2 & 3, as amended
ECTLV / TWA:	Time Weighted Average (TWA):
GV (DK) / GV:	Threshold Limit Values (TLV):

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; EIGA - European Industrial Gases Association; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - substance of very high concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

SAFETY DATA SHEET
According to Regulation (EC) No. 1907/2006 (REACH) Article 31, Annex II as amended

Isopentane

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Key literature references and sources for data:

Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to:
Agency for Toxic Substances and Diseases Registry (ATSDR) (http://www.atsdr.cdc.gov/).
European Chemical Agency: Guidance on the Compilation of Safety Data Sheets.
European Chemical Agency: Information on Registered Substances http://apps.echa.europa.eu/registered/registered-sub.aspx#search
European Industrial Gases Association (EIGA) Doc. 169 "Classification and Labelling guide", as amended.
International Programme on Chemical Safety (http://www.inchem.org/)
ISO 10156:2010 Gases and gas mixtures - Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets.
Matheson Gas Data Book, 7th Edition.
National Institute for Standards and Technology (NIST) Standard Reference Database Number 69.
The ESIS (European chemical Substances 5 Information System) platform of the former European Chemicals Bureau (ECB) ESIS (http://ecb.jrc.ec.europa.eu/esis/).
The European Chemical Industry Council (CEFIC) ERICards.
United States of America's National Library of Medicine's toxicology data network TOXNET (http://toxnet.nlm.nih.gov/index.html)
Threshold Limit Values (TLV) from the American Conference of Governmental Industrial Hygienists (ACGIH).
Substance specific information from suppliers.
Details given in this document are believed to be correct at the time of publication.

Wording of the H-statements in section 2 and 3

H224	Extremely flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H336	May cause drowsiness or dizziness.
H411	Toxic to aquatic life with long lasting effects.

Training information:

Users of breathing apparatus must be trained. Ensure operators understand the flammability hazard.

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Classification according to Regulation (EC) No 1272/2008 as amended.

Flam. Liq. 1, H224

STOT SE 3, H336

Asp. Tox. 1, H304

Aquatic Chronic 2, H411

Other information: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Ensure adequate air ventilation. Ensure all national/local regulations are observed. Ensure equipment is adequately earthed. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

Last revised date: 18.03.2024

Disclaimer: This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.