ZapSibNeftekhim LLC

SAFETY DATA SHEET

According to Regulations (EC) 1907/2006 (REACH), (EC) 1272/2008 (CLP) & (EU) 2015/830

ISOBUTANE FRACTION

Version: 3.2
Date created: 21/12/2020

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

1.1. Product identifier

Product form:	Substance
Substance name:	Isobutane
Chemical name:	Isobutane
EC index No.:	601-004-00-0
EC No.:	200-857-2
CAS-No.:	75-28-5
REACH registration No:	01-2119485395-27-0008
Formula:	C4H10
Synonyms:	2-methylpropane
Trade names:	Isobutane, Isobutane fraction Premium grade, Isobutane fraction

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

1.2.1. Relevant identified uses

Use of the substance/mixture:	Distribution of substance Use as a fuel Blowing agents Formulation and (re)packaging of substances and mixtures Polymer production Polymer processing Functional fluids Manufacture of substance Propellants For the detailed identified uses of the product see Annex.
Most common technical function of substance:	Intermediates Fuels and fuel additives

1.2.2. Uses advised against

Restrictions on use:	Uses other than those given in section 1.2.1 are not recommended unless an assessment is completed, prior to commencement of that use, which demonstrates that the use will be controlled

1.3. Details of the supplier of the safety data sheet

Only representative

Company name:	Gazprom Marketing and Trading France
Address:	68 avenue des Champs-Elysées, 75008, Paris, France
Contact Telephone:	+33 1 42 99 73 50
Fax:	+33 1 42 99 73 99
Email Address:	didier.lebout@gazprom-mt.com

Manufacturer

Company name:	ZapSibNeftekhim LLC

Address:	Promzona, 626150, Tobolsk, Tyumen region, Russian Federation
Contact phone:	+7 (3456) 398-000
Fax:	+7 (3456) 266-449
Email Address:	ZapSib@sibur.ru
Emergency Telephone:	+7 (3456) 398-755; +7 (3456) 398-000, ext. 8899 (office hours only, GMT+5)

1.4. Emergency telephone number

Emergency phone in the country of delivery	**112** (*Please note that emergency numbers may vary depending upon the country of delivery though 112 remains valid as universal number*

SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

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

Flam. Gas 1	H220
Liquefied gas	H280

Full text of hazard classes and H-statements : see section 16

2.2. Label elements

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

Hazard pictograms (CLP):

GHS02

GHS04

Signal word (CLP):	**Danger**
Hazard statements (CLP):	H220: Extremely flammable gas H280: Contains gas under pressure; may explode if heated.
Precautionary statements (CLP):	P102: Keep out of reach of children. P210: Keep away from heat/sparks/open flames/... /hot surfaces.... No smoking. P243: Take precautionary measures against static discharge. P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381: Eliminate all ignition sources if safe to do so. P410+P403: Protect from sunlight. Store in a well-ventilated place.
EUH-statements:	Not applicable.

2.3. Other hazards

Other hazards not contributing to the classification:	Contact with the liquid may result in frostbite.
Assessment PBT / vPvB:	According to Annex XIII of Regulation (EC) No.1907/2006 (REACH): - not fulfilling PBT (persistent/bioaccumulative/toxic) criteria; - not fulfilling vPvB (very persistent/very bioaccummulative) criteria.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Name	Product identifier	%	Classification [CLP]
Isobutane	(CAS-No.) 75-28-5 (EC No.) 200-857-2 (EC index No.) 601-004-00-0 (REACH-no) 01-2119485395-27-0008	>98.0	H224, H280

1,3-butadiene	(CAS-No.) 106-99-0 (EC No.) 203-450-8 (EC index No.) 601-013-00-X	<0.1	H220, H280, H340, H350

Full text of hazard classes and H-statements : see section 16.

The product does not contain impurities or additives that could affect product's labelling and classification according to Regulation (EC) No 1272/2008 (CLP).

3.2. Mixtures

Not applicable.

SECTION 4. FIRST-AID MEASURES

4.1. Description of first aid measures

Product-specific hazards and other issues

Extremely flammable liquefied gas.

An asphyxiant at high concentrations – oxygen depletion can be fatal.

Contact with the liquid may result in frostbite.

First-aid measures general

Warning before intervention: Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply. Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces.

Take care to self-protect by avoiding becoming contaminated – use approved positive pressure air supplied breathing apparatus with a full facepiece. Move contaminated patient(s) out of the dangerous area. Seek medical assistance - show the safety data sheet or label if possible.

First-aid measures after inhalation

Immediately remove to fresh air. Do not leave the victim unattended. Keep patient warm and at rest. If unconscious place in recovery position. If any symptoms persist, seek immediate medical attention.

Monitor breathing and pulse rate. If breathing is difficult, give oxygen if possible, or assisted ventilation. In the event of cardiac arrest, (no pulse), apply cardiopulmonary resuscitation. Seek medical attention immediately.

First-aid measures after skin contact

Do not remove clothing that adheres due to freezing but cut round them.

Immediately flush affected area with plenty of water – continue for at least 15 minutes.

If there are signs of frostbite, (blanching or redness of skin or burning or tingling sensation), do not rub, massage or compress the affected area. Send the casualty immediately to hospital. Keep contaminated clothing away from ignition sources.

First-aid measures after eye contact

If possible, remove any contact lenses. Flush eyes with water thoroughly and continuously for at least 15 minutes. Do not use hot water. Keep eye wide open while rinsing. If any symptoms persists, the patient should be seen in a specialist health care facility.

First-aid measures after ingestion

This product is a gas; hence oral exposure and resulting acute toxicity are unlikely.

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

Symptoms/effects after inhalation:	Headache weakness, dizziness, drowsiness. Exposure to high concentrations may cause asphyxiation, unconsciousness.
Symptoms/effects after skin contact:	Frostbite, redness, edema, pain.
Symptoms/effects after eye contact:	Frostbite, pain, swelling, lachrimation or photophobia.
Symptoms/effects after ingestion:	Is not considered a likely route of exposure – frostbite to the lips and mouth may occur if in contact with the liquid.

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

Advice to physician

Treatment should in general be symptomatic and directed to relieving any effects. Treat cold burns as frostbite.

SECTION 5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media:	LARGE FIRE: Use water spray, water fog or foam. SMALL FIRE: Dry powder or carbon dioxide (CO2) extinguisher, dry sand or fire fighting foam.
Unsuitable extinguishing media:	Do not use water jet. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard:	Extremely flammable liquefied gas. Vapours are heavier than air and can spread along the ground or float on water surfaces to remote ignition sources. Runoff to sewer may create fire or explosion hazard.
Explosion hazard:	Vapours can form explosive mixtures with air.
Hazardous decomposition products in case of fire:	Carbon monoxide (CO), Carbon dioxide (CO2), unburned hydrocarbons (smoke). Partial combustion forms also: soot and cracked products: aldehydes, ketones.

5.3. Advice for firefighters

Firefighting instructions:	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. First move people out of line-of-sight of the scene and away from windows. If gas has ignited, do not attempt to extinguish but stop gas flow and allow to burn out. Use water spray to cool heat-exposed containers, and to protect surrounding areas and personnel effecting shut-off. Every precaution must be taken to keep containers cool to avoid the possibility of a boiling liquid expanding vapour explosion (BLEVE). Pressurised containers are liable to explode violently when subjected to high temperatures.
Protection during firefighting:	Fire-fighters should wear self-contained breathing apparatus (SCBA) and full chemical protective clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURE

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures	No action shall be taken involving any personal risk or without suitable training. Accidental releases pose a serious fire or explosion hazard. Avoid direct contact with released material and breathing vapours. Stay upwind. Immediately contact emergency personnel.

6.1.2. For emergency responders

Emergency procedures	Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Eliminate all ignition sources. Avoid breathing gas. Ensure good ventilation. Follow all fire-fighting procedures Do not enter a vapour cloud except for rescue; self-contained breathing apparatus must be worn. A gas detector or instrument to detect explosive atmospheres (explosimeter) can be used to check for combustible gas or vapour in an atmosphere, but it needs care and training to be used safely. Liquid leaks generate large volumes

of extremely flammable gas. Use suitable protective equipment If local exhaust ventilation or other methods of ventilation are not possible or are insufficient, wear suitable respiratory protective devices. Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. Wear self-contained breathing apparatus.

6.2. Environmental precautions

Liquid leaks generate large volumes of flammable vapour, heavier than air, which may travel to remote sources of ignition (e.g. along drainage systems). Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
Land spillage: Prevent further leakage or spillage if safe to do so. Prevent spillage from entering drains or any place where accumulation may occur. Ensure adequate ventilation, especially in confined areas.
Spillages in water or at sea: Prevent further leakage or spillage if safe to do so. Spillages of liquid product in the water will likely result in a quick and complete vaporization of the product. Isolate the area and prevent fire/explosion hazard for ships and other structures, taking into account wind direction and speed, until the material is completely dispersed. If the spillage contaminates rivers, lakes or drains inform respective authorities.

6.3. Methods and material for containment and cleaning up

Large spill: Immediately contact emergency personnel. Stop leak if without risk. The method and equipment used must be in conformance with appropriate regulations and industry practice on explosive atmospheres. Where appropriate, use water spray to disperse the gas or vapour and to protect personnel attempting to stop leakage.
Small Spill: Immediately contact emergency personnel. Stop leak if without risk. The method and equipment usedmust be in conformance with appropriate regulations and industry practice on explosive atmospheres

6.4. Reference to other sections

SECTION 8: Exposure controls/personal protection. SECTION 13: Disposal considerations.

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Precautions for safe handling	Use only with adequate ventilation. Avoid breathing vapours of this product. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Use explosion proof electrical (ventilating, lighting and material handling) equipment. Use piping and equipment designed to withstand the pressures to be encountered. Use a check valve or other protective device to prevent reverse flow. When handling cylinders wear protective footwear and suitable gloves. Avoid contact with eyes. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Regularly inspect, test and maintain all control measures. Cleaning, inspection and maintenance of the internal structure of storage tanks must be done only by properly equipped and qualified personnel as defined by national, local or company regulations. Handle empty containers with care; vapour residue may be flammable. Do not pressurise, cut, weld, braze, solder, drill, or grind on containers.

	Dispose of rinse water in accordance with local and national regulations. Ensure that all relevant regulations regarding explosive atmospheres, and handling and storage facilities of flammable products are followed.
Hygiene measures	Wash thoroughly after handling. Wash your hands at the end of each work shift, before and after eating, drinking, smoking or using the toilet.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions	Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store and use only in equipment/containers designed for use with this product. Containers must be properly labelled. Do not remove warning labels from containers. Cylinders should be secured vertical - and only transported in a secure position in a well ventilated vehicle or hand truck. Cylinders which have been are opened must be carefully resealed and kept upright. For maintenance work or conservation, emptied tanks should be purged, and blanketed with inert gas (i.e. nitrogen).
Incompatible materials	Oxidising agents, halogens (Fluorine, Chlorine, Bromine, Iodine), hydrogen chloride or hydrogen fluoride, combustible substances, oxygen.
Storage area	Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Avoid all possible sources of ignition (spark or flame).
Packaging materials	Keep/Store only in original container (Steel).

7.3. Specific end use(s)

Not applicable.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

8.1.1. Occupational Exposure Limits

Isobutane (CAS 75-28-5)

	LTEL TWA ppm	LTEL TWA mg/m³	STEL ppm	STEL mg/m³	Note
Belgium	1000				
Finland	800	1900	1000(1)	2400(1)	(1) 15 minutes average value
Germany (AGS)	1000	2400	4000 (1)	9600 (1)	(1) 15 minutes average value
Germany (DFG)	1000	2400	4000	9600	STV 15 minutes average value
Switzerland	800	1900			

8.1.2. DNEL/ PNEC values

Isobutane (CAS 75-28-5)

DNEL/DMEL (Workers)	
Acute - systemic effects, dermal	No data available: testing technically not feasible
Acute - systemic effects, inhalation	No-threshold effect and/or no dose-response information available

Acute - local effects, dermal	No data available: testing technically not feasible
Acute - local effects, inhalation	No-threshold effect and/or no dose-response information available
Long-term - systemic effects, dermal	No data available: testing technically not feasible
Long-term - systemic effects, inhalation	No-threshold effect and/or no dose-response information available
Long-term - local effects, dermal	No data available: testing technically not feasible
Long-term - local effects, inhalation	No-threshold effect and/or no dose-response information available
DNEL/DMEL (General population)	
Acute - systemic effects, dermal	No data available: testing technically not feasible
Acute - systemic effects, inhalation	No-threshold effect and/or no dose-response information available
Acute - systemic effects, oral	No data available: testing technically not feasible
Acute - local effects, dermal	No data available: testing technically not feasible
Acute - local effects, inhalation	No-threshold effect and/or no dose-response information available
Long-term - systemic effects, dermal	No data available: testing technically not feasible
Long-term - systemic effects, inhalation	No-threshold effect and/or no dose-response information available
Long-term - systemic effects,oral	No data available: testing technically not feasible
Long-term - local effects, dermal	No data available: testing technically not feasible
Long-term - local effects, inhalation	No-threshold effect and/or no dose-response information available
PNEC (water)	
PNEC aqua (freshwater)	Not applicable.
PNEC aqua (marine water)	Not applicable.
PNEC aqua (intermittent, freshwater)	Not applicable.
PNEC (Sediment)	
PNEC sediment (freshwater)	Not applicable.
PNEC sediment (marine water)	Not applicable.
PNEC (Soil)	
PNEC soil	Not applicable.
PNEC (Oral)	
PNEC oral (secondary poisoning)	Not applicable.
PNEC (STP)	
PNEC sewage treatment plant	Not applicable.

8.2. Exposure controls

Appropriate engineering controls:

Use closed systems during use of product. Use explosion-proof ventilation equipment. Provide easy access to water supply and eye wash facilities. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Hand protection:

Glove material suitable protective gloves, e.g. nitrile-butadiene rubber (NBR) gloves, leather gloves, heat insulating. Selection of protective gloves to meet the requirements of specific workplaces. Suitability for specific workplaces should be clarified with protective glove

manufacturers.
The useful time per day of a chemical protection glove may be much shorter than the permeation time determined according to EN 374 due to the many different influential factors involved (e.g. temperature).
If contact with the liquid form of the product is expected, use cold-protection gloves (EN 511).

Eye protection:
Safety glasses with side-shields (frame goggles) (e.g. EN 166).

Skin and body protection:
Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

Respiratory protection:
If contact is possible or in case of emergency, wear positive pressure self-contained breathing apparatus.

Environmental exposure controls:
Discharge into the environment must be avoided.

Other information:
Hygiene measures: Observe good industrial hygiene practices. Do not get in eyes. Avoid contact with skin. Wash contaminated clothing before reuse. When using do not smoke. Wash hands before breaks and immediately after handling the product. Observe the rules usually applicable when handling chemicals.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical state at 20 °C and 101.3 kPa	Colourless gas
Odour:	Odourless
Odour threshold	Not available
Melting / freezing point	-159.4˚C
Boiling point	-11.73°C
Density	0.589 g/cm3 at 25˚C
Vapour pressure	Not applicable.
Surface tension	Not applicable.
Water solubility	53.5mg/l (slightly soluble)
Partition coefficient n-octanol/water (log value)	log Kow = 2.8
Flash point	-87˚C
Flammability	The explosion limits of Isobutane are 1.8-8.4%. This data would result in a classification of category 1 flammable gas and the hazard statement 'extremely flammable gas'.
Explosive properties	Not applicable
Self-ignition temperature	460˚C
Oxidising properties	Not applicable
Viscosity	7.6 µPa s at 27°C
Granulometry	Not applicable
Stability in organic solvents and identity of relevant degradation products	Not available
Dissociation constant	Not applicable

9.2. Other information

Not available.

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

Liquefied gas. Extremely flammable. Product is combustible if heated above the flash point. Stable at room temperature in closed containers under normal storage and handling conditions.

10.2. Chemical stability

Stable under normal storage and handling conditions.

10.3. Possibility of hazardous reactions

Vapours may form explosive mixture with air.

10.4. Conditions to avoid

Keep away from heat and sources of ignition. Avoid proximity or contact with hot surfaces, flames, electrostatic charges or sparks.

10.5. Incompatible materials

Oxidising agents, halogens (Fluorine, Chlorine, Bromine, Iodine), hydrogen chloride or hydrogen fluoride, combustible substances, oxygen.

10.6. Hazardous decomposition products

In case of fire or thermal decomposition production of, for example, carbon monoxide, carbon dioxide (CO_2). Partial combustion, forms also: soot and cracked products: aldehydes, ketones

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity

Isobutane (CAS 75-28-5)	
LD50, oral	Not relevant - gas at room temperature.
LC50, inhalation, mice	52.04 ± 3.26 % v/v (approximately 520,400 ppm or 1237 mg/L)
LD50, dermal	Not relevant - gas at room temperature.

Skin corrosion/irritation	Not relevant - gas at room temperature.
Additional information	Direct skin contact with liquid forms of isobutane may cause burns and frostbite due to the extreme cold of the liquid.
Serious eye damage/irritation	Not relevant - gas at room temperature.
Additional information	Direct mucous membrane contact with liquid forms of isobutane may cause burns and frostbite due to the extreme cold of the liquid.
Respiratory or skin sensitisation	Not sensitizing.
Additional information	Not relevant - gas at room temperature.
Germ cell mutagenicity	Genetic toxicity: no adverse effect observed (negative). CLP classification (Regulation (EC) No 1272/2008): no classification required.
Additional information	Mutagenicity data exist for substances under the Petroleum Gases. A review of an extensive database indicates they are not genotoxic. The product contain < 0.1% 1,3-butadiene and should not be considered mutagenic.
Carcinogenicity	CLP classification (Regulation (EC) No 1272/2008): no classification required. No data available.
Additional information	In accordance with section 1 of REACH Annex XI, testing does not appear to be scientifically necessary since negative genotoxicity data

	and consideration of their simple chemical structures provide sufficient weight of evidence to conclude the Petroleum gases are unlikely to show any significant carcinogenic activity. The product contain < 0.1% 1,3-butadiene and should not be considered carcinogenic.
Toxicity for reproduction	CLP classification (Regulation (EC) No 1272/2008): no classification required.

Isobutane (CAS 75-28-5)	
NOAEC (effects on fertility) (P), inhalation, rat (systemic effects)	9000 ppm (21,394 mg/m³) no treatment-related effects at the highest concentration tested) (OECD Guideline 422, EPA OPPTS 870.3650)
NOAEC (developmental toxicity) (F1):, inhalation, rat	9000 ppm (21,394 mg/m³) (no treatment-related effects at the highest concentration tested) (OECD Guideline 422, EPA OPPTS 870.3650)
NOAEC (effects on fertility) (P), inhalation, rat (systemic effects)	3000 ppm (7131 mg/m³)(OECD Guideline 422, EPA OPPTS 870.3650)
NOAEC (Reproductive endpoints) (P), inhalation, rat	3000 ppm (7131 mg/m³)(OECD Guideline 422, EPA OPPTS 870.3650)

STOT-single exposure	Not available.
Repeated dose toxicity	CLP classification (Regulation (EC) No 1272/2008): Specific Target Organ Toxicity: Repeated Exposure: no classification required.

Isobutane (CAS 75-28-5)	
NOAEC (systemic), inhalation, rat	9000 ppm (highest concentration tested) (OECD Guideline 422, EPA OPPTS 870.3650)
NOAEC (systemic), inhalation, rat	21394 mg/m³ air (highest concentration tested) (OECD Guideline 422, EPA OPPTS 870.3650)

Aspiration hazard	Not available.

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

Isobutane (CAS 75-28-5)	
Fish (Short-term toxicity)	
LC50 (96h)	27.98 mg/L (freshwater)(estimated)(QSAR)
Fish (Long-term toxicity)	
Not available.	
Aquatic invertebrates (Short-term toxicity)	
LC50 (48 h)	16.33 mg/L – *Daphnia (*freshwater*)* (estimated) (QSAR)
Aquatic invertebrates (Long-term toxicity)	
Not available.	
Algae and aquatic plants	
EC50(96 h)	8.57 mg/L – *Green algae* (freshwater) (estimated) (QSAR)
Toxicity to aquatic micro-organisms	
Not available.	

12.2. Persistence and degradability

Abiotic degradation:	No data available. Petroleum gases are not expected to undergo hydrolysis in the environment due to a lack of hydrolyzable functional groups
Biodegradation	Readily biodegradable

	% degradation of test substance: 50 after 3.1 d (calculated QSAR degradation)
Persistence and degradability	Based on predicted half lives the Petroleum gases would not meet the criteria for persistent (P) or very persistent (vP).

12.3. Bioaccumulative potential

Aquatic bioaccumulation:	Not expected to bioaccumulate due to the low log Kow < 3.
Secondary poisoning:	The Petroleum gases are readily biodegradable and exhibit a low bioaccumulation potential. Therefore, an assessment of secondary poisoning is not required.

12.4. Mobility in soil

Biodegradation in soil:	No data available.

12.5. Results of PBT and vPvB assessment

Regarding all available data on biotic and abiotic degradation, bioaccumulation and toxicity it can be stated that the substance does not fulfil the PBT criteria (not PBT) and not the vPvB criteria (not vPvB).

12.6. Other adverse effects

Not available.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste disposal recommendations	Disposal recommendations: Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Regulatory disposal information: Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.
European List of Waste (LoW) code	Not available

SECTION 14. TRANSPORT INFORMATION

14.1. Land transport (ADR/ RID)

UN-No.	1969
Proper Shipping Name:	ISOBUTANE
Hazard class:	2.1
Packing group:	Not applicable
Hazard label:	
Classification Code:	2F

Hazard identification number (HIN):	23
Tunnel restriction code (ADR)	B/D
Environmental hazard:	No
EAC code	2YE

14.2. Inland waterway transport (ADN)

UN-No.	1969
Proper Shipping Name:	ISOBUTANE
Hazard class:	2.1
Packing group:	Not applicable
Hazard label:	
Classification Code:	2F
Hazard identification number (HIN):	23
Environmental hazard:	No

14.3. Sea transport (IMDG)

UN-No.	1969
Proper Shipping Name:	ISOBUTANE
Hazard class:	2.1
Packing group:	Not applicable
Hazard label:	
EmS-No. (Fire)	F-D
EmS-No. (Spillage)	S-U
Marine pollutant:	No

14.4. Air transport (IATA/ICAO)

UN-No.	1969
Proper Shipping Name:	ISOBUTANE
Hazard class:	2.1
Packing group:	Not applicable
Hazard label:	
ERG Code	10 L
Environmental hazard:	No

14.5. Special precautions for user

Always transport in closed containers. Ensure that persons transporting the product know what to do in the event of an accident or spillage. For information regarding Exposure Controls/Personal Protection see Section 8 of the SDS

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

Not applicable

SECTION 15. REGULATORY INFORMATION

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

15.1.1. EU-Regulations

Authorisations and/or restrictions on use (Annex XVII):

Entry 40	Conditions of restriction
Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 or not.	1. Shall not be used, as substance or as mixtures in aerosol dispensers where these aerosol dispensers are intended for supply to the general public for entertainment and decorative purposes such as the following: – metallic glitter intended mainly for decoration, – artificial snow and frost, – 'whoopee' cushions, – silly string aerosols, – imitation excrement, – horns for parties, – decorative flakes and foams, – artificial cobwebs, – stink bombs. 2. Without prejudice to the application of other Community provisions on the classification, packaging and labelling of substances, suppliers shall ensure before the placing on the market that the packaging of aerosol dispensers referred to above is marked visibly, legibly and indelibly with: 'For professional users only'. 3. By way of derogation, paragraphs 1 and 2 shall not apply to the aerosol dispensers referred to Article 8 (1a) of Council Directive 75/324/EEC. 4. The aerosol dispensers referred to in para graphs 1 and 2 shall not be placed on the market unless they conform to the requirements indicated.

Isobutane is not on the REACH Candidate List.
Isobutane is not on the REACH Annex XIV List.

Other information, restriction and prohibition regulations	Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer. Annex II - Not listed. Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances- (SEVESO III): Physical Hazard – P2 - Flammable gases. Directive 2013/39/EU priority substances in the field of water policy (amending Directive 2006/60/EC – Water Framework Directive and Directive 2008/105/EC on environmental quality standards in the field of water policy): Not listed. Regulation (EC) No 850/2004 on persistent organic pollutants: Annex III – Not listed. Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals: Not listed.

15.1.2. National regulations

Germany	AwSV (Verordnung über Anlagen zum Umgang	Identification number (Kennummer): 562

mit wassergefährdenden Stoffen)	Water hazard class (WGK): nwg
German storage class (LGK)	LGK 2A - Gases
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV	Is not subject of the 12. BlmSchV (Hazardous Incident Ordinance)

15.2. Chemical safety assessment

Chemical Safety Report has been performed for Isobutane

SECTION 16. OTHER INFORMATION

16.1. Indication of changes

Version	Date of change	Section	Description of changes
1.0	17/03/2010		HS&E Manager
2.1	08/02/2011		Version was created according to Regulation (EC) No 1272/2008 (Regulation CLP) & 453/2010.
2.2	17/05/2016	Title, 1.3	1. Company name of the Supplier was changed from «Tobolsk-Neftekhim» on «SIBUR Tobolsk».
3.0	17/01/2019	1-16, Annex	SDS has been corrected in according to new data of Registration dossier, Chemical Safety Report and new Transport information
3.1	18/03/2020	1	Trade names were added, manufacturer's contact telephone number was modified
3.2	21/12/2020	1.3, 1.4	Company name of the Supplier was changed

16.2. Abbreviations and acronyms

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
AGS	The German Committee on Hazardous Substances (Ausschuss für Gefahrstoffe – AGS)
BCF	Bioconcentration factor
DFG	Germany Research Foundation
DNEL	Derived No Effect Level
IMDG	International Maritime Dangerous Goods
ICAO-TI	Technical Instructions for the Safe Transport of Dangerous Goods by Air
K_{oc}	Adsorption coefficient
Kow	octanol-water partition coefficient
LC50	Lethal Concentration to 50 % of a test population
LD50	Lethal Dose to 50% of a test population (Median Lethal Dose)
LOAEC	Lowest Observable Adverse Effect Concentration
LTEL	Long Term Exposure Limit
NIOSH	National Institute for Occupational Safety and Health *(USA CDC)*
NOEC	No Observed Effect Concentration
NOAEL	No Observed Adverse Effect Level
OECD	Organization for Economic Co-operation and Development
PNEC	Predicted No Effect Concentration
PBT	Persistent, bioaccumulative, toxic chemical
vPvB	Very Persistent, Very Bioaccumulative
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SCOEL	Scientific Committee on Occupational Exposure Limits
STEL	Short Term Exposure Limit
STP	sewage treatment plant

STOT	Specific Target Organ Toxicity
(STOT) RE	Repeated Exposure
(STOT) SE	Single Exposure
TWA	Time Weighted Average
UN	United Nations
WGK	Wassergefährdungsklasse *(German: Water Hazard Class)*

16.3. Full text of H- and EUH-statements:

H220	Flam. Gas 1	Extremely flammable gas.
H280	Liquified gas	Contains gas under pressure; may explode if heated.
H340	Muta, Cat.1B	May cause genetic defects
H350	Carc. 1A	May cause cancer.

16.4. List of ES (exposure scenario) given in Annex to the extended SDS

Isobutane is not classified for human health or the environment, is not a CMR and is not PBT or vPvB. An exposure assessment and the calculation of risk characterisation ratios are therefore not required. Relevant identified uses of the substance are described in the Annex to the SDS.

16.5. Key literature references and sources

CHEMICAL SAFETY REPORT to ISOBUTANE

EU DIRECTIVES

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

Regulation (EC) No 1272/2008 REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Regulations. Commission regulation (EU) no 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

Training advice

Personnel handling the product has to be acquainted demonstrably with its hazardous properties, with health and environmental protection principles related to the product and first aid principles.

DISCLAIMER

This information is based on our current level of knowledge. This information may be subject to revision as new knowledge and experience becomes available, and SIBUR makes no warranties and assumes no liability in connection with any use of this information. Since SIBUR cannot be aware of all aspects of your business and the impact the REACH Regulation has for your company, SIBUR strongly encourages you to get familiar with the REACH Regulation in order to comply with its requirements and timelines.

ANNEX. RELEVANT IDENTIFIED USES OF THE SUBSTANCE

Uses by workers in industrial settings

Identified Use (IU) name	Use descriptors
Distribution of substance	**Process category (PROC):** PROC 1: Use in closed process, no likelihood of exposure PROC 2: Use in closed, continuous process with occasional controlled exposure PROC 3: Use in closed batch process (synthesis or formulation) PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC 15: Use as laboratory reagent **Environmental release category (ERC):** ERC 6a: Industrial use resulting in manufacture of another substance (use of intermediates) **Sector of end use (SU):** SU 8: Manufacture of bulk, large scale chemicals (including petroleum products) SU 9: Manufacture of fine chemicals
Use as a fuel	**Process category (PROC):** PROC 1: Use in closed process, no likelihood of exposure PROC 2: Use in closed, continuous process with occasional controlled exposure PROC 3: Use in closed batch process (synthesis or formulation) PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 16: Using material as fuel sources, limited exposure to unburned product to be expected **Environmental release category (ERC):** ERC 7: Industrial use of substances in closed systems **Sector of end use (SU):** SU 0: Other: 3
Blowing agents	**Process category (PROC):** PROC 1: Use in closed process, no likelihood of exposure PROC 2: Use in closed, continuous process with occasional controlled exposure PROC 3: Use in closed batch process (synthesis or formulation) PROC 8b: Transfer of substance or preparation (charging/discharging) from/to

Identified Use (IU) name	**Use descriptors**
	vessels/large containers at dedicated facilities PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC 12: Use of blowing agents in manufacture of foam **Environmental release category (ERC):** ERC 8a: Wide dispersive indoor use of processing aids in open systems **Sector of end use (SU):** SU 0: Other: 3
Formulation and (re)packaging of substances and mixtures	**Process category (PROC):** PROC 1: Use in closed process, no likelihood of exposure PROC 2: Use in closed, continuous process with occasional controlled exposure PROC 3: Use in closed batch process (synthesis or formulation) PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC 14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation PROC 15: Use as laboratory reagent **Environmental release category (ERC):** ERC 2: Formulation of preparations **Sector of end use (SU):** SU 10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
Polymer production	**Process category (PROC):** PROC 1: Use in closed process, no likelihood of exposure PROC 2: Use in closed, continuous process with occasional controlled exposure PROC 3: Use in closed batch process (synthesis or formulation) PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 16: Using material as fuel sources, limited exposure to unburned product to be expected **Environmental release category (ERC):** ERC 5: Industrial use resulting in inclusion into or onto a matrix **Sector of end use (SU):**

Identified Use (IU) name	**Use descriptors**
	SU 10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
Polymer processing	**Process category (PROC):** PROC 1: Use in closed process, no likelihood of exposure PROC 2: Use in closed, continuous process with occasional controlled exposure PROC 3: Use in closed batch process (synthesis or formulation) PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC 6: Calendering operations PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC 13: Treatment of articles by dipping and pouring PROC 14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation **Environmental release category (ERC):** ERC 5: Industrial use resulting in inclusion into or onto a matrix **Sector of end use (SU):** SU 10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
Functional fluids	**Process category (PROC):** PROC 1: Use in closed process, no likelihood of exposure PROC 2: Use in closed, continuous process with occasional controlled exposure PROC 3: Use in closed batch process (synthesis or formulation) PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **Environmental release category (ERC):** ERC 7: Industrial use of substances in closed systems **Sector of end use (SU):** SU 0: Other: 3
Manufacture of substance	**Process category (PROC):** PROC 1: Use in closed process, no likelihood of exposure PROC 2: Use in closed, continuous process with occasional controlled exposure PROC 3: Use in closed batch process (synthesis or formulation)

Identified Use (IU) name	**Use descriptors**
	PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 15: Use as laboratory reagent **Sector of end use (SU):** SU 8: Manufacture of bulk, large scale chemicals (including petroleum products) SU 9: Manufacture of fine chemicals
Uses by professional workers	
Use as a fuel	**Process category (PROC):** PROC 1: Use in closed process, no likelihood of exposure PROC 2: Use in closed, continuous process with occasional controlled exposure PROC 3: Use in closed batch process (synthesis or formulation) PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 16: Using material as fuel sources, limited exposure to unburned product to be expected **Environmental release category (ERC):** ERC 9a: Wide dispersive indoor use of substances in closed systems ERC 9b: Wide dispersive outdoor use of substances in closed systems Sector of end use (SU): Other: 22
Propellants	**Process category (PROC):** PROC 11: Non industrial spraying **Environmental release category (ERC):** ERC 8a: Wide dispersive indoor use of processing aids in open systems **Sector of end use (SU): Other: 22**
Polymer processing	**Process category (PROC):** PROC 1: Use in closed process, no likelihood of exposure PROC 2: Use in closed, continuous process with occasional controlled exposure PROC 3: Use in closed batch process (synthesis or formulation) PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC 6: Calendering operations PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Identified Use (IU) name	**Use descriptors**
	PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 14: Production of preparations or articles by tabletting, compression, extrusion, pelletisation PROC 21: Low energy manipulation of substances bound in materials and/or articles **Sector of end Environmental release category (ERC):** ERC 5: Industrial use resulting in inclusion into or onto a matrix **Use (SU): Other: 22**
Functional fluids	**Process category (PROC):** PROC 1: Use in closed process, no likelihood of exposure PROC 2: Use in closed, continuous process with occasional controlled exposure PROC 3: Use in closed batch process (synthesis or formulation) PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC 20: Heat and pressure transfer fluids in dispersive, professional use but closed systems **Environmental release category (ERC):** ERC 7: Industrial use of substances in closed systems **Sector of end use (SU): Other: 22**
Uses by consumers	
Identified Use (IU) name	**Use descriptors**
Use as a fuel	**Chemical product category (PC):** PC 13: Fuels **Environmental release category (ERC):** ERC 9a: Wide dispersive indoor use of substances in closed systems ERC 9b: Wide dispersive outdoor use of substances in closed systems
Propellants	**Chemical product category (PC):** PC 1: Adhesives, sealants PC 2: Adsorbents PC 3: Air care products PC 4: Anti-freeze and de-icing products PC 0: Other: 5, 10 PC 31: Polishes and wax blends PC 35: Washing and cleaning products (including solvent based products) PC 39: Cosmetic personal care products **Environmental release category (ERC):** ERC 8a: Wide dispersive indoor use of processing aids in open systems

END OF SAFETY DATA SHEET