

SAFETY DATA SHEET



Revision Date 24-Jul-2018

SDS Number 888100004770

Revision Number 2.03

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

Product Name Isobutane

Synonyms 2-methylpropane, I-butane, soC4, Isobutane (Polymerization Grade) Methylpropane, ISO, Liquefied Butane, Trimethyl Methane, Liquefied Petroleum Gas Butane Isomer, APPC899

Recommended Use Fuel
Uses advised against All others

Manufacturer
Tesoro Refining & Marketing Co.
19100 Ridgewood Parkway
San Antonio, TX 78259

Emergency Telephone Chemtrec: 1-800-424-9300
Tesoro Call Center: 1-877-783-7676

E-mail address ProductStewardship@TSOCORP.com

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable gases	Category 1
Gases under pressure	Liquefied gas

Label elements

Danger

Extremely flammable gas
Contains gas under pressure; may explode if heated



Appearance Gas

Physical State @20°C Gas

Odor Faint, gasoline-like

Precautionary Statements - Prevention

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Wear protective gloves/protective clothing/eye protection/face protection
Keep away from heat/sparks/open flames/hot surfaces. - No smoking

Precautionary Statements - Response

IF exposed or concerned: Get medical advice/attention
Eliminate all ignition sources if safe to do so
Leaking gas fire: Do not extinguish, unless leak can be stopped safely

Precautionary Statements - Storage

Store in well-ventilated place

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Not applicable

Other Information

Not applicable.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Percent
Isobutane	75-28-5	85-99
Butane	106-97-8	0-10
Propane	74-98-6	0-5

4. FIRST AID MEASURES

Description of first aid measures

General advice

Remove from exposure, lie down. In case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt, seek medical advice. Never give anything by mouth to an unconscious person. Take off all contaminated clothing immediately and thoroughly wash material from skin.

Inhalation

Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. Administer oxygen if breathing is difficult. Seek immediate medical attention/advice.

Eye contact

Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Get medical attention immediately if symptoms occur.

Skin contact

For dermal contact or suspected frostbite, remove contaminated clothing and flush affected areas with lukewarm water. Immediate medical attention is required.

Ingestion

Ingestion is not typically an exposure route of gases or compressed gases. If swallowed, call a poison control center or physician immediately.

Self-protection of the first aider

Remove all sources of ignition. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Wear personal protective clothing (see section 8). Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.

Most important symptoms and effects, both acute and delayed

Symptoms

In high concentration the gas may cause a suffocation. Victim may not be aware of

asphyxiation.

Indication of any immediate medical attention and special treatment needed

Note to physicians A patient adversely affected by exposure to this product should not be given adrenaline (epinephrine) or similar heart stimulant since these would increase the risk of cardiac arrhythmias.

5. FIRE-FIGHTING MEASURES

Small Fire Any extinguisher suitable for Class B fires, dry chemical, CO₂, foam (AFFF/ATC), or water spray can be used.

Large Fire Water spray, fog or alcohol-resistant foam. CAUTION: Use of water spray when fighting fire may be inefficient. Cool containers with flooding quantities of water until well after fire is out.

Unsuitable extinguishing media DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.

Specific hazards arising from the chemical Vapors may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.). Vapors may form explosive mixture with air. Vapors may travel to areas away from work site before igniting/flashing back to vapor source. May accumulate electrostatic charge and ignite or explode.

Hazardous combustion products Smoke, CO, and other products of incomplete combustion.

Explosion data
Sensitivity to Mechanical Impact None.
Sensitivity to Static Discharge Yes.

Special protective equipment for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn.

Further information ALWAYS stay away from tanks engulfed in fire. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Do not direct water at source of leak or safety devices; icing may occur. Cool containers with flooding quantities of water until well after fire is out. Do not allow run-off from fire-fighting to enter drains or water courses.

NFPA Health hazards 0 Flammability 4 Stability 0 Physical and chemical properties -

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions Keep people away from and upwind of spill/leak. Stop leak if you can do it without risk. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Use grounding and bonding connection when transferring this material to prevent static discharge, fire or explosion. Flammable vapor may accumulate to flammable ranges in confined spaces or containers. Monitor area for flammable or explosive atmosphere.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Do not breathe gas. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Flammable/toxic gases may accumulate in confined areas (basements, tanks, hopper/tank cars etc.). Pay attention to flashback. Use only with adequate ventilation and in closed systems. Empty containers pose a potential fire and explosion hazard. Do not cut, puncture or weld containers. Comply with all applicable EPA, OSHA, NFPA and consistent state and local requirements.

Conditions for safe storage, including any incompatibilities

Storage Conditions Store in a dry place. Store in a closed container. Store in accordance with local regulations. Protect from sunlight. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Keep away from food, drink and animal feed. Incompatible with oxidizing agents. Incompatible with acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	ACGIH TLV	OSHA PEL
Isobutane 75-28-5	STEL: 1000 ppm	-
Butane 106-97-8	STEL: 1000 ppm	(vacated) TWA: 800 ppm (vacated) TWA: 1900 mg/m ³
Propane 74-98-6	: See Appendix F: Minimal Oxygen Content	TWA: 1000 ppm TWA: 1800 mg/m ³ (vacated) TWA: 1000 ppm (vacated) TWA: 1800 mg/m ³

NOTE: Limits shown for guidance only. For additional information, OSHA's 1989 air contaminants standard exposure limits provided even though the limits were vacated in 1992. State, local or other agencies or advisory groups may have established more stringent limits. Follow applicable regulations.

Appropriate engineering controls

Engineering controls Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection Use goggles or face-shield where there is a possibility of splashing.

Hand Protection Wear suitable gloves.

Skin and body protection Wear suitable protective clothing.

Respiratory protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Use a NIOSH approved respirator when there is a potential for airborne concentrations to exceed occupational exposure limits. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2, NIOSH Respirator Decision Logic, and the respirator manufacturer for additional guidance on respiratory protection selection. A Self-Contained Breathing Apparatus (SCBA) should be used for fire fighting. Use a NIOSH approved positive-pressure supplied air respirator if there is a potential for uncontrolled release,

exposure levels are unknown, in oxygen deficient (less than 19.5% oxygen), or any other circumstance where an air-purifying respirator may not provide adequate protection.

General hygiene considerations Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State @20°C	Gas
Appearance	Gas
Odor	Faint, gasoline-like
Color	Colorless
Odor threshold	Odor threshold reported in ranges from 2500 to 5000 parts per million

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	Not applicable	
Melting point / freezing point	-187 °C / -305 °F	
Boiling range	-12 °C	
Flash point	< -60 °C / -76 °F	
Evaporation rate	No data available	
Flammability (solid, gas)	Gas	
Flammability Limit in Air %		
Upper flammability limit:	8.5	
Lower flammability limit:	1.8	
Vapor pressure	3004	
Vapor density	2.007	
Relative density	0.56	
Water solubility	Negligible	
Solubility in other solvents	No data available	
Partition coefficient	2.8	
Autoignition temperature	460 °C / 860 °F	
Decomposition temperature	No data available	
Kinematic viscosity	No data available	
Dynamic viscosity	No data available	
Explosive properties	No data available	
Oxidizing properties	No data available	
Minimum Ignition Energy (mJ)	No data available	
K _{st} (bar.m/s)	No data available	
Softening point	No data available	
VOC Content (%)	No data available	
Density	No data available	
Bulk density	Not applicable	
Conductivity	Hydrocarbon liquids without static dissipater additive may have conductivity below 1 picoSiemens per meter (pS/m). The highest electro-static ignition risks are associated with "ultra-low conductivities" below 5 pS/m. See Section 7 for sources of information on defining safe loading and handling procedures for low conductivity products. Note that conductivity can be reduced by environmental factors such as a decrease in temperature	

10. STABILITY AND REACTIVITY

Reactivity This product is non-reactive under normal conditions.

Chemical stability Stable under recommended storage conditions.

Possibility of hazardous reactions None under normal processing.

Conditions to avoid Heat, flames and sparks.

Incompatible materials Oxidizing or reducing agents. Acids. Alkali.

Hazardous decomposition products None under normal use conditions.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation	Specific test data for the substance or mixture is not available.
Eye contact	Specific test data for the substance or mixture is not available.
Skin contact	Specific test data for the substance or mixture is not available.
Ingestion	Specific test data for the substance or mixture is not available.

Information on toxicological effects

Symptoms No information available.

Numerical measures of toxicity

Acute toxicity

Chemical Name	Oral LD50	LD50/dermal/rat - NO UNITS (Wizards mg/kg)	Inhalation LC50
Isobutane 75-28-5	-	-	= 658 mg/L (Rat) 4 h
Butane 106-97-8	-	-	= 658 g/m ³ (Rat) 4 h
Propane 74-98-6	-	-	= 658 mg/L (Rat) 4 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chemical Name

Butane

If inhaled, short-term overexposure to hydrocarbon gases may cause rapid suffocation. Inhalation of butane at very high concentrations can cause drowsiness, narcosis, asphyxia, and cardiac arrhythmia; butane affects the central nervous system (CNS). As gases, the primary route of exposure is inhalation; compressed gases may exhibit additional hazards. In animal studies, 2-Butene was the most toxic of the C1-4 hydrocarbon gas (C1-4 HCs) evaluated for its short term (acute) toxicity when inhaled for four hours at 10,000 ppm (23.1 g/m³); no fatalities were observed, and no LC50 value was established. Repeated dose toxicity has been observed in combination with testing for reproductive and developmental toxicity; the lowest dose at which adverse effects were observed (LOAEL) following repeated dose reported to be 5,000 ppm. Adverse effects included lowered body weight, though some changes in blood chemistry were also reported. C1-4 HCs were not mutagenic in several test systems using bacteria or mammalian cells, nor were they mutagenic in animal studies. No adverse developmental effects were reported for the highest dose tested (NOAEL ≥ 5,000 ppm). Reproductive toxicity was reported for isobutene (LOAEL = 9,000 ppm) as reduced fertility in females and pregnancy loss; caution should be used in interpreting the results of this study due to the small number of animals tested. The carcinogenicity of individual petroleum streams varies due to factors such as source and processing; IARC and ECHA C&L Inventory reports individually on the carcinogenicity of these substances.

Health hazard and classification information

Skin Corrosion/Irritation Category No information available.

Serious eye damage/eye irritation No information available.

	No information available.
Germ cell mutagenicity	No information available.
Carcinogenicity	Classification based on data available for ingredients. Contains a known or suspected carcinogen.
Reproductive toxicity	No information available.
Target Organ Systemic Toxicant - Single Exposure	No information available.
Target Organ Systemic Toxicant - Repeated Exposure	No information available.
Target organ effects	Central nervous system.
Aspiration hazard	No information available.

12. ECOLOGICAL INFORMATION

Additional Ecological Information	Release of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems. U.S.A. regulations require reporting spills of this material that could reach any surface waters. The toll free number to the U.S. Coast Guard National Response Center is (800) 424-8802
Ecotoxicity	.
Persistence and degradability	No information available.
Bioaccumulation	There is no data for this product.

Component Information

Chemical Name	Partition coefficient
Isobutane 75-28-5	2.88
Butane 106-97-8	2.89
Propane 74-98-6	2.3

Other adverse effects	No information available.
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13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products	Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.
Contaminated packaging	Do not reuse empty containers.

14. TRANSPORT INFORMATION

DOT

UN/ID no	UN1969
Proper Shipping Name	ISOBUTANE
Hazard Class	2.1
Special Provisions	19, T50
Description	UN1969, ISOBUTANE, 2.1
Emergency Response Guide Number	115

TDG	Forbidden Not regulated
Description	Forbidden

MEX	
UN/ID no	UN1969
Proper Shipping Name	ISOBUTANE
Hazard Class	2.1
Description	UN1969, ISOBUTANE, 2.1

IATA	
UN/ID no	UN1969
Proper Shipping Name	ISOBUTANE
Hazard Class	2.1
ERG Code	10L
Description	UN1969, ISOBUTANE, 2.1

IMDG	
UN/ID no	UN1969
Proper Shipping Name	ISOBUTANE
Hazard Class	2
EmS No.	F-D, S-U
Description	UN1969, ISOBUTANE, 2

15. REGULATORY INFORMATION

International Inventories

TSCA	Listed
DSL/NDSL	Listed
ENCS	Listed
IECSC	Listed
KECL	Listed
PICCS	Listed
AICS	Listed

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Acute health hazard	No
Chronic Health Hazard	Yes
Fire hazard	Yes
Sudden release of pressure hazard	No

Reactive Hazard

No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, fractions of crude oil, and products (both finished and intermediate) from the crude oil refining process and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, as well as the Clean Water Act may still apply.

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

US State Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Isobutane 75-28-5	X	X	X
Butane 106-97-8	X	X	X
Propane 74-98-6	X	X	X
Pentane 109-66-0	X	X	X

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Revision Date 24-Jul-2018

Revision Note No information available.

Disclaimer

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End of Safety Data Sheet