



Material Safety Data Sheet



Flammable



Dangerous to the Environment



Harmful

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

2-Methyl-2-Butene

Product Use: Intermediate

Product Number(s): 0001021755, 0001034801, 0001021753, 0001021754, 0001030212, 0001083996, 0001020539

Synonyms: 2-MB-2; beta-Isoamylene; Isoamylene

Product Cas No.: 513-35-9

Company Identification:

Chevron Phillips Chemical Company LP
Specialty Chemicals
10001 Six Pines Drive
The WoodlandsTX 77380

Product Information:

MSDS Requests: (800) 852 - 5530
Technical Information: (832) 813 - 4862

24-Hour Emergency Telephone Numbers

HEALTH: Chevron Phillips Emergency Information Center 866.442.9628 (North America) and 1.832.813.4984 (International)

TRANSPORTATION: North America: CHEMTREC 800.424.9300 or 703.527.3887

ASIA: +1.703.527.3887

EUROPE: BIG .32.14.584545 (phone) or .32.14.583516 (telefax)

SOUTH AMERICA SOS-Cotec Inside Brazil: 0800.111.767

Outside Brazil: 55.19.3467.1600

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENT	CAS NUMBER	AMOUNT	EINECS	SYM	R-PHRASE S
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Revision Number: 3

Revision Date: 12/01/2004

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2-Methyl-2-Butene

MSDS : 110000

2-Methyl-2-butene	513-35-9	91.3 % weight	NA	NA	NA
2-Methyl-1-Butene	563-46-2	8.3 % weight	NA	NA	NA
Related Materials	VARIOUS	< 0.5 % weight	NA	NA	NA

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
2-Methyl-1-Butene	CPCHEM	Not Established	NA	NA	NA
2-Methyl-2-butene	CPCHEM	Not Established	NA	NA	NA

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Colorless liquid. Mild odor.

- HIGHLY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE
- HARMFUL OR FATAL IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE
- CAUSES SKIN IRRITATION
- TOXIC TO AQUATIC ORGANISMS

IMMEDIATE HEALTH EFFECTS:

Eye: Not expected to cause prolonged or significant eye irritation.

Skin: Contact with the skin causes irritation. Not expected to be harmful to internal organs if absorbed through the skin. Contact with the skin is not expected to cause an allergic skin response. Contact with the skin is not expected to cause prolonged or significant irritation.

Ingestion: May be harmful if swallowed. This material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.

Inhalation: Not expected to be harmful if inhaled.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with running water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

Skin: To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse. Get medical attention if any symptoms develop.

Ingestion: If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get immediate medical attention. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

FIRE CLASSIFICATION:

Classification (29 CFR 1910.1200): Flammable liquid or gas.

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0

FLAMMABLE PROPERTIES:**Flashpoint:** -45 °C (-49°F) (Setaflash Closed Cup)**Autoignition:** NDA**Flammability (Explosive) Limits (% by volume in air):** Lower: 1.4 Estimated Upper: 9.6**EXTINGUISHING MEDIA:** Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.**PROTECTION OF FIRE FIGHTERS:****Fire Fighting Instructions:** For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.**Combustion Products:** Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion. Combustion may form: Carbon Oxides**SECTION 6 ACCIDENTAL RELEASE MEASURES****Protective Measures:** Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator. Eliminate potential sources of ignition. Handling equipment must be bonded and grounded to prevent sparking. Wear appropriate personal protective equipment when cleaning up spills. Refer to Section 8.**Spill Management:** Clean up spills immediately and wash spill area with water, observing precautions in Exposure Controls/Personal Protection section. Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible sorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.**Reporting:** U.S.A. regulations require reporting spills of this material that could reach any surface waters. Report spills to local authorities and/or the National Response Center at (800) 424-8802 as appropriate or required.**SECTION 7 HANDLING AND STORAGE****READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL . REFER TO PRODUCT LABEL OR MANUFACTURERS TECHNICAL BULLETINS FOR THE PROPER USE AND HANDLING OF THIS MATERIAL .****Precautionary Measures:** This material presents a fire hazard. Liquid quickly evaporates and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 15F.**General Handling Information:** Avoid work practices that may release volatile components in the atmosphere. Local air pollution regulations should be consulted to determine if the release of volatile components is regulated or restricted in the area in which this material is used. Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.**Static Hazard:** Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations, which have the potential of generating an accumulation

of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids, National Fire Protection Association (NFPA 77), Recommended Practice on Static Electricity' (liquids, powders and dusts), and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents' (liquids).

General Storage Information: DO NOT USE OR STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use. Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, 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. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner, or disposed of properly.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, 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. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3) applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT:

Eye/Face Protection: Wear eye protection such as safety glasses, chemical goggles, or faceshields if engineering controls or work practices are not adequate to prevent eye contact.

Skin Protection: Wear impervious protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Users should determine acceptable performance characteristics of protective clothing. Consider physical requirements and other substances present when selecting protective clothing. Suggested materials for protective gloves include: Nitrile Rubber

Respiratory Protection: If exposure is anticipated to be greater than applicable exposure limits, wear a NIOSH approved respirator that provides adequate protection from measured concentrations of this material. Use the following elements for air-purifying respirators: Air-Purifying Respirator for Organic Vapors, Dusts and Mists

Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
2-Methyl-1-Butene	CPCHEM	Not Established	NA	NA	NA
2-Methyl-2-butene	CPCHEM	Not Established	NA	NA	NA

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Colorless liquid. Mild odor.

pH: NA

VAPOR PRESSURE: 14.3 psia @ 37.8 °C (100°F)

VAPOR DENSITY (AIR=1): NDA

BOILING POINT: 38.6 °C (101.48°F)

SOLUBILITY (in water): Negligible

PERCENT VOLATILE: 100 % volume

SPECIFIC GRAVITY: 0.668 @ 15.6 °C (60.1°F)

EVAPORATION RATE: >1

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: No Data Available

Incompatibility With Other Materials: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous Decomposition Products: Carbon Oxides formed when burned.

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS:

Acute Oral Toxicity: LD50 / rat / 700 - 2600 mg/kg

Acute Dermal Toxicity: LD50 / rat / > 2000 mg/kg

Acute Inhalation Toxicity: LC50 / rat / > 61,000 ppm / 4 hour(s)

Eye Irritation: This material is not expected to be irritating to the eyes.

Skin Irritation: This material is irritating to the skin.

Sensitization: Dermal - This material is not a sensitizer

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains 2-METHYL-2-BUTENE:

GENETIC TOXICITY: Bacterial Reverse Mutation Assay = Negative / Cytogenetic Assay = Negative / Micronucleus Assay 2 days / inhalation / mouse / Doses; 1000, 3260, 10000 ppm 6 hrs/day / dose related increase in micronuclei observed at 3260 ppm and higher

HUMAN: Male volunteers exposed to aerosol experienced moderate eye irritation

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY:

This material is expected to be toxic to aquatic organisms.

- 48 hour(s) / EC50 / water flea (*Daphnia magna*) / 3.84 mg/l
- 72 hour(s) / LC50 / Algae (*Pseudokirchneriella subcapitata*) / 10.5 mg/l
- 96 hour(s) / LC50 / rainbow trout (*Oncorhynchus mykiss*) / 4.99 mg/l

ENVIRONMENTAL FATE:

Biodegradability: 4 - 15 % volume

The environmental fate of this material is not available.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

Shipping Descriptions per regulatory authority.

US DOT

2-METHYL-2-BUTENE, 3, UN2460, II

ICAO / IATA

2-METHYL-2-BUTENE, 3, UN2460, II

IMO / IMDG

2-METHYL-2-BUTENE, 3, UN2460, II, (-45 °C)

RID / ADR

UN2460, 2-METHYL-2-BUTENE, 3, II, ADR

SECTION 15 REGULATORY INFORMATION

SARA 311/312 CATEGORIES:

1. Immediate (Acute) Health Effects:	YES
2. Delayed (Chronic) Health Effects:	NO
3. Fire Hazard:	YES
4. Sudden Release of Pressure Hazard:	NO
5. Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01 = CA Prop 65	17 = FDA 178	33 = RCRA Waste Appendix VIII
02 = LA RTK	18 = FDA 179	34 = RCRA Waste D-List
03 = MA RTK	19 = FDA 180	35 = RCRA Waste P-List
04 = MN Hazardous Substance	20 = FDA 181	36 = RCRA Waste U-List
05 = NJ RTK	21 = FDA 182	37 = SARA Section 311/312
06 = PA RTK	22 = FDA 184	38 = SARA Section 313
07 = CAA Section 112 HAPs	23 = FDA 186	39 = TSCA 12 (b)
08 = CWA Section 307	24 = FDA 189	40 = TSCA Section 4
09 = CWA Section 311	25 = IARC Group 1	41 = TSCA Section 5(a)
10 = DOT Marine Pollutant	26 = IARC Group 2A	42 = TSCA Section 8(a) CAIR
11 = FDA 172	27 = IARC Group 2B	43 = TSCA Section 8(a) PAIR
12 = FDA 173	28 = IARC Group 3	44 = TSCA Section 8(d)
13 = FDA 174	29 = IARC Group 4	45 = WHIMS - IDL
14 = FDA 175	30 = NTP Carcinogen	46 = Germany D TAL
15 = FDA 176	31 = OSHA Carcinogen	47 = Germany WKG
16 = FDA 177	32 = OSHA Highly Hazardous	

The following components of this material are found on the regulatory lists indicated.

2-Methyl-2-butene 3, 5, 6

WHMIS CLASSIFICATION:

Class B, Division 2: Flammable Liquids
Skin or Eye Irritation

CHEMICAL INVENTORY LISTINGS:

AUSTRALIA: All the components of this material are listed on the Australian Inventory of Chemical Substances (AICS).

CANADA: All the components of this material are on the Canadian Domestic Substances List (DSL).

PEOPLE'S REPUBLIC OF CHINA: All the components of this product are listed on the draft Inventory of Existing Chemical Substances in China.

EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh Amendment Directive 92/32/EEC.

JAPAN: All the components of this product are on the Existing & New Chemical Substances (ENCS) inventory in Japan, or have an exemption from listing.

KOREA: All the components of this product are on the Existing Chemicals List (ECL) in Korea.

PHILIPPINES: All the components of this product are listed on the Philippine Inventory of Chemicals and Chemical Substances (PICCS).

UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

EU RISK AND SAFETY PHRASES:

R11: Highly flammable.

R22: Harmful if swallowed.
 R38: Irritating to skin.
 R65: Harmful: may cause lung damage if swallowed.
 R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
 S2: Keep out of the reach of children.
 S9: Keep container in a well-ventilated place.
 S16: Keep away from sources of ignition - No smoking.
 S24: Avoid contact with skin.
 S51: Use only in well-ventilated areas.
 S62: If swallowed do not induce vomiting: seek medical advice immediately and show this container or label.
 S36/37: Wear suitable protective clothing and gloves.

EU Symbols: Xn F N

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0 Special: NA

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA).

REVISION STATEMENT: This revision updates all sections of the MSDS please review.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	Threshold Limit Value	TWA	- Time Weighted Average
STEL	Short-term Exposure Limit	PEL	- Permissible Exposure Limit
ACGIH	American Conference of - Government Industrial Hygienists	OSHA	- Occupational Safety & Health
NIOSH	National Institute of Safety & Health	NFPA	- National Fire Protection Agency
WHMIS	Workplace Hazardous Materials - Information System	IARC	- Intl. Agency for Research on Cancer
EINECS	European Inventory of existing - Commercial Chemical Sales	RCRA	- Resource Conservation Recovery Act
SARA	Superfund Amendments and - Reauthorization Act.	TSCA	- Toxic Substance Control Act
EC50	Effective Dose	LC50	- Lethal Concentration
LD50	Lethal Dose	CAS	- Chemical Abstract Service Number
NDA	No Data Available	NA	- Not Applicable
<=	Less Than or Equal To	>=	- Greater Than or Equal To
CNS	Central Nervous System	MAK	- Germany Maximum Concentration Values

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This data sheet is prepared according to the latest adaptation of the EEC Guideline 67/548.
This data sheet is prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200).
This data sheet is prepared according to the ANSI MSDS Standard (Z400.1).
This data sheet was prepared by EHS Product Stewardship Group, Chevron Phillips Chemical Company LP, 10001 Six Pines Drive, The Woodlands, TX 77380.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.