



Section 1: IDENTIFICATION

Product Name: BB Mix (Lima)

Synonyms: BB; BB Feed; FCC C3/C4 Splitter Bottoms; FCC Depropanizer Bottoms; Depropanizer Reboiler Liquid; Cat Butane to Storage.

Product Use: FCC butane intermediate sent to the BB Treater Unit for further processing.

Restrictions on Use: Not available.

Manufacturer/Supplier: Husky Lima Refinery
1150 South Metcalf Street
Lima, OH 45804

Phone Number: 403-298-6111

Emergency Phone: Chemtrec: 1-800-424-9300
Husky Emergency Response Center: 877-262-2111

Date of Preparation of SDS: February 16, 2018

Section 2: HAZARD(S) IDENTIFICATION

GHS INFORMATION

Classification: Flammable Gases, Category 1
Gases Under Pressure - Compressed Gas
Germ Cell Mutagenicity, Category 1B
Carcinogenicity, Category 1A
Simple Asphyxiant, Category 1

LABEL ELEMENTS

Hazard

Pictogram(s):



Signal Word: Danger

Hazard Statements: Extremely flammable gas.
Contains gas under pressure; may explode if heated.
May cause genetic defects.
May cause cancer.
May displace oxygen and cause rapid suffocation.

Precautionary Statements

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

Response: IF exposed or concerned: Get medical advice/attention.
Leaking gas fire: Do not extinguish, unless leak can be stopped safely.



Storage: Eliminate all ignition sources if safe to do so.
Store in a well-ventilated place.
Store locked up.
Protect from sunlight.

Disposal: Dispose of contents/container in accordance with applicable regional, national and local laws and regulations.

Hazards Not Otherwise Classified: Not applicable.

Ingredients with Unknown Toxicity: None.

This material is considered hazardous by the OSHA Hazard Communication Standard, (29 CFR 1910.1200). This material is considered hazardous by the Hazardous Products Regulations.

Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredient(s)	Common name / Synonyms	CAS No.	% vol./vol.
Gases (petroleum), fluidized catalytic cracker splitter residues	Not available.	68919-19-7	100
Propane, 2-methyl-	Isobutane	75-28-5	22 - 36
1-Propene, 2-methyl-	Isobutylene	115-11-7	15 - 17
Butene	Not available.	25167-67-3	13 - 19
2-Butene, (2E)-	trans-2-Butene	624-64-6	13 - 15
Butane	Not available.	106-97-8	10 - 13
2-Butene	Not available.	107-01-7	7 - 13
Propane	Not available.	74-98-6	1 - 3
Butane, 2-methyl-	Isopentane	78-78-4	1 - 2
1,3-Butadiene	Not available.	106-99-0	0.2 - 0.4

Section 4: FIRST-AID MEASURES

Inhalation: If inhaled: Call a poison center or doctor if you feel unwell. If breathing or the heart stops, trained personnel should immediately begin artificial respiration (AR) or cardiopulmonary resuscitation (CPR) respectively. Get medical attention immediately.

Acute and delayed symptoms and effects: May displace oxygen and cause rapid suffocation. May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Eye Contact: If in eyes: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor.

Acute and delayed symptoms and effects: Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. The pain after contact with liquid can quickly subside. Permanent eye damage or blindness could result. May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.



Skin Contact: Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. If on skin: Wash with plenty of water. Get immediate medical advice/attention. Remove non-adhering contaminated clothing. Do not remove adherent material or clothing.

Acute and delayed symptoms and effects: Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside. May cause skin irritation. Signs/symptoms may include localized redness, swelling, and itching.

Ingestion: Not a normal route of exposure.

Acute and delayed symptoms and effects: Not a normal route of exposure.

General Advice: In case of accident or if you feel unwell, seek medical advice immediately (show the label or SDS where possible).

Note to Physicians: Symptoms may not appear immediately.

Section 5: FIRE-FIGHTING MEASURES

FLAMMABILITY AND EXPLOSION INFORMATION

Extremely flammable gas. Contains gas under pressure; may explode if heated. Will be easily ignited by heat, sparks or flames. Will form explosive mixtures with air. Vapors from liquefied gas are initially heavier than air and spread along ground. Vapors may travel to source of ignition and flash back. Cylinders exposed to fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket. DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.

If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.

Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Sensitivity to Mechanical Impact: This material is not sensitive to mechanical impact.

Sensitivity to Static Discharge: This material is sensitive to static discharge.

MEANS OF EXTINCTION

Suitable Extinguishing Media: Small Fire: Dry chemical or CO2.

Large Fire: Water spray or fog. Move containers from fire area if you can do it without risk.

Unsuitable Extinguishing Media: Not available.

Products of Combustion: Oxides of carbon.

Protection of Firefighters: Leaking gas fire: Do not extinguish, unless leak can be



stopped safely. Eliminate all ignition sources if safe to do so. Vapors may cause dizziness or asphyxiation without warning. Some may be irritating if inhaled at high concentrations. Fire may produce irritating and/or toxic gases. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection. Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

Section 6: ACCIDENTAL RELEASE MEASURES

- Emergency Procedures:** As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Keep out of low areas. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). All equipment used when handling the product must be grounded.
- Personal Precautions:** Do not touch or walk through spilled material. Use personal protection recommended in Section 8.
- Environmental Precautions:** Not normally required.
- Methods for Containment:** Stop leak if you can do it without risk. If possible, turn leaking containers so that gas escapes rather than liquid. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Do not direct water at spill or source of leak.
- Methods for Clean-Up:** Prevent spreading of vapors through sewers, ventilation systems and confined areas. Isolate area until gas has dispersed. CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.
- Other Information:** See Section 13 for disposal considerations.

Section 7: HANDLING AND STORAGE

- Handling:** Avoid breathing gas. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, sparks, open flames, and hot surfaces. No smoking. Pressurized container: Do not pierce or burn, even after use. See Section 8 for information on Personal Protective Equipment.
- Storage:** Store in a well-ventilated place. Store locked up. Protect from sunlight. Store away from incompatible Materials. See Section 10 for information on Incompatible Materials. Keep out of the reach of children.



Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

Component

Gases (petroleum), fluidized catalytic cracker splitter residues [CAS No. 68919-19-7]

ACGIH: No TLV established.

OSHA: 1000 ppm (TWA), 1800 mg/m³ (TWA); For Propane.

Isobutane [CAS No. 75-28-5]

ACGIH: 1000 ppm (STEL); (2012)

OSHA: No PEL established.

Isobutylene [CAS No. 115-11-7]

ACGIH: 250 ppm (TWA); A4 (2007)

OSHA: No PEL established.

Butylene [CAS No. 25167-67-3]

ACGIH: 250 ppm (TWA); (2007)

OSHA: No PEL established.

trans-2-Butene [CAS No. 624-64-6]

ACGIH: 250 ppm (TWA); (2007)

OSHA: No PEL established.

Butane [CAS No. 106-97-8]

ACGIH: 1000 ppm (STEL); (2012)

OSHA: 800 ppm (TWA) [Vacated];

2-Butene [CAS No. 107-01-7]

ACGIH: 250 ppm (TWA); (2007)

OSHA: No PEL established.

Propane [CAS No. 74-98-6]

ACGIH: Simple asphyxiant; Explosion hazard

OSHA: 1000 ppm (TWA), 1800 mg/m³ (TWA);

Isopentane [CAS No. 78-78-4]

ACGIH: 1000 ppm (TWA); (2013)

OSHA: No PEL established.

1,3-Butadiene [CAS No. 106-99-0]

ACGIH: 2 ppm (TWA); A2 (1994)

OSHA: 1 ppm (TWA), 2.2 mg/m³ (TWA); 5 ppm (STEL);

PEL: Permissible Exposure Limit

TLV: Threshold Limit Value

TWA: Time-Weighted Average

STEL: Short-Term Exposure Limit



Engineering Controls: Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapour, gas, etc.) below recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT (PPE)



Eye/Face Protection: Wear safety glasses. Use equipment for eye protection that meets the standards referenced by CSA Standard CAN/CSA-Z94.3-92 and OSHA regulations in 29 CFR 1910.133 for Personal Protective Equipment.

Hand Protection: Wear cold insulating gloves. Cotton-lined neoprene or PVC material is recommended. Consult manufacturer specifications for further information.

Skin and Body Protection: Wear protective clothing.

Respiratory Protection: If engineering controls and ventilation are not sufficient to control exposure to below the allowable limits then an appropriate NIOSH/MSHA approved air-purifying respirator that meets the requirements of CSA Standard CAN/CSA-Z94.4-1, or self-contained breathing apparatus must be used. Supplied air breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.

General Hygiene Considerations: Handle according to established industrial hygiene and safety practices.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Liquefied gas under pressure.
Colour:	Clear, colourless.
Odour:	Hydrocarbon.
Odour Threshold:	1262 ppm (Isobutane) 640.11 ppm (Weighted average)
Physical State:	Gas.
pH:	Not available.
Melting Point / Freezing Point:	-105.6 °C (-158 °F) (trans-2-Butene) -141.39 °C (-222.5 °F) (Weighted average)
Initial Boiling Point:	Not available.
Boiling Range:	Not available.
Flash Point:	-117 °C (-178.6 °F) () (Isobutane)



Evaporation Rate:	>> 1 (Water = 1)
Flammability (solid, gas):	Extremely flammable gas.
Lower Flammability Limit:	1.6 % (Butene)
Upper Flammability Limit:	10 % (Butene)
Vapor Pressure:	438.6 kPa at 20 °C (68 °F) (Isobutylene) 202.53 kPa at 20 °C (68 °F) (Weighted average)
Vapor Density:	2 (Air = 1) (Isobutane) 1.96 (Air = 1) (Weighted Average)
Relative Density:	0.59 (Water = 1)
Solubilities:	Very slightly soluble in cold water, hot water.
Partition Coefficient: n-Octanol/Water:	Not available.
Auto-ignition Temperature:	287 °C (548.6 °F) (Butane)
Decomposition Temperature:	Not available.
Viscosity:	Not available.
Percent Volatile, wt. %:	100
VOC content, wt. %:	Not available.
Density:	Not available.
Coefficient of Water/Oil Distribution:	The product is more soluble in oil.

Section 10: STABILITY AND REACTIVITY

Reactivity:	Contact with incompatible materials. Sources of ignition. Exposure to heat.
Chemical Stability:	Stable under normal storage conditions.
Possibility of Hazardous Reactions:	None known.
Conditions to Avoid:	Contact with incompatible materials. Sources of ignition. Exposure to heat.
Incompatible Materials:	Strong oxidizers. Chlorine.
Hazardous Decomposition Products:	Oxides of carbon.



Section 11: TOXICOLOGICAL INFORMATION

EFFECTS OF ACUTE EXPOSURE

Product Toxicity

Oral: Not available.

Dermal: Not available.

Inhalation: Not available.

Component Toxicity

Component	CAS No.	LD ₅₀ oral	LD ₅₀ dermal	LC ₅₀
Gases (petroleum), fluidized catalytic cracker splitter residues	68919-19-7	Not available.	Not available.	Not available.
Isobutane	75-28-5	Not available.	Not available.	570000 ppm (rat); 15M
Isobutylene	115-11-7	Not available.	Not available.	620000 mg/m ³ (rat); 4H
Butene	25167-67-3	Not available.	Not available.	Not available.
trans-2-Butene	624-64-6	Not available.	Not available.	Not available.
Butane	106-97-8	Not available.	Not available.	658000 mg/m ³ (rat); 4H
2-Butene	107-01-7	Not available.	Not available.	425 ppm (mouse); 4H
Propane	74-98-6	Not available.	Not available.	Not available.
Isopentane	78-78-4	Not available.	Not available.	Not available.
1,3-Butadiene	106-99-0	5480 mg/kg (rat)	Not available.	285000 mg/m ³ (rat); 4H

Likely Routes of Exposure: Eye contact. Skin contact. Inhalation.

Target Organs: Skin. Eyes. Respiratory system. Blood. Cardiovascular system. Bone marrow. Liver. Kidneys. Nervous system.

Symptoms (including delayed and immediate effects)

Inhalation: May displace oxygen and cause rapid suffocation. May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Eye: Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. The pain after contact with liquid can quickly subside. Permanent eye damage or blindness could result. May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Skin: Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside. May cause skin irritation. Signs/symptoms may include localized redness, swelling, and itching.

Ingestion: Not a normal route of exposure.

Skin Sensitization: Not available.

Respiratory Sensitization: Not available.



Medical Conditions Not available.
Aggravated By Exposure:

EFFECTS OF CHRONIC EXPOSURE (from short and long-term exposure)

Target Organs: Skin. Eyes. Respiratory system. Blood. Cardiovascular system. Bone marrow. Liver. Kidneys. Nervous system.

Chronic Effects: Prolonged or repeated inhalation of Isopentane may cause dizziness, weakness, weight loss, anemia, nervousness, pains in the limbs and peripheral numbness. This material contains 1,3-Butadiene which is known to cause damage to the blood, kidneys, the nervous system, liver, heart, brain, peripheral nervous system, cardiovascular system, and central nervous system.

Carcinogenicity: May cause cancer. This material may contain trace amounts of 1,3 Butadiene. Epidemiology studies indicate an association between exposure to 1,3-butadiene and leukemia in humans.

Component Carcinogenicity

Component	ACGIH	IARC	NTP	OSHA	Prop 65
Isobutylene	A4	Not listed.	Not listed.	Not listed.	Not listed.
1,3-Butadiene	A2	Group 1	List 1	OSHA Carcinogen.	Listed.

Mutagenicity: May cause genetic defects. May cause heritable genetic damage. Mutations have been observed in in vitro and in vivo assays in rodents exposed to 1,3 Butadiene.

Reproductive Effects: 1,3-Butadiene may cause reproductive effects in long term exposure.

Developmental Effects

Teratogenicity: Not available.

Embryotoxicity: Not available.

Toxicologically Synergistic Materials: Not available.

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity: Not available.

Persistence / Degradability: Not available.

Bioaccumulation / Accumulation: Not available.

Mobility in Environment: Not available.

Other Adverse Effects: Not available.

Section 13: DISPOSAL CONSIDERATIONS

Disposal Instructions: Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.



Section 14: TRANSPORT INFORMATION

U.S. Department of Transportation (DOT)

Proper Shipping Name: UN1075, PETROLEUM GASES, LIQUEFIED, 2.1

Class: 2.1

UN Number: UN1075

Packing Group: Not applicable.

Label Code:



Canada Transportation of Dangerous Goods (TDG)

Proper Shipping Name: UN1075, PETROLEUM GASES, LIQUEFIED, 2.1

Class: 2.1

UN Number: UN1075

Packing Group: Not applicable.

Label Code:



Section 15: REGULATORY INFORMATION

Chemical Inventories

US (TSCA)

The components of this product are in compliance with the chemical notification requirements of TSCA.

Canada (DSL)

The components of this product are in compliance with the chemical notification requirements of the NSN Regulations under CEPA, 1999.

Federal Regulations

United States

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SARA Title III

Component	Section 302 (EHS) TPQ (lbs.)	Section 304 EHS RQ (lbs.)	CERCLA RQ (lbs.)	Section 313	RCRA CODE	CAA 112(r) TQ (lbs.)
Gases (petroleum), fluidized catalytic cracker splitter residues	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000



Husky Energy

BB Mix (Lima)

SAFETY DATA SHEET

Date of Preparation: February 16, 2018

Isobutane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Isobutylene	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Butylene	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
trans-2-Butene	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Butane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
2-Butene	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Propane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Isopentane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
1,3-Butadiene	Not listed.	Not listed.	10	313	Not listed.	10000

State Regulations

Massachusetts

US Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

Component

Component	CAS No.	RTK List
Gases (petroleum), fluidized catalytic cracker splitter residues	68919-19-7	Listed.
Isobutane	75-28-5	Listed.
Isobutylene	115-11-7	Listed.
Butylene	25167-67-3	Listed.
trans-2-Butene	624-64-6	Listed.
Butane	106-97-8	Listed.
2-Butene	107-01-7	Listed.
Propane	74-98-6	Listed.
Isopentane	78-78-4	Listed.
1,3-Butadiene	106-99-0	E

Note: E = Extraordinarily Hazardous Substance

New Jersey

US New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

Component

Component	CAS No.	RTK List
Gases (petroleum), fluidized catalytic cracker splitter residues	68919-19-7	SHHS
Isobutane	75-28-5	SHHS
Isobutylene	115-11-7	SHHS
Butylene	25167-67-3	SHHS
trans-2-Butene	624-64-6	SHHS
Butane	106-97-8	SHHS
2-Butene	107-01-7	SHHS
Propane	74-98-6	SHHS
Isopentane	78-78-4	SHHS
1,3-Butadiene	106-99-0	SHHS

Note: SHHS = Special Health Hazard Substance



Husky Energy

SAFETY DATA SHEET

BB Mix (Lima)

Date of Preparation: February 16, 2018

Pennsylvania

US Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

Component	CAS No.	RTK List
Gases (petroleum), fluidized catalytic cracker splitter residues	68919-19-7	Listed.
Isobutane	75-28-5	Listed.
Isobutylene	115-11-7	Listed.
Butylene	25167-67-3	Listed.
trans-2-Butene	624-64-6	Listed.
Butane	106-97-8	Listed.
2-Butene	107-01-7	Listed.
Propane	74-98-6	Listed.
Isopentane	78-78-4	Listed.
1,3-Butadiene	106-99-0	ES

Note: E = Environmental Hazard; S = Special Hazardous Substance

California

California Prop 65:



WARNING This product can expose you to 1,3-Butadiene, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Section 16: OTHER INFORMATION

Disclaimer:

The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for his own particular use.

Date of Preparation of SDS: February 16, 2018

Version: 3.1

GHS SDS Prepared by: Deerfoot Consulting Inc.

Phone: (403) 720-3700