MESA Specialty Gases & Equipment
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Santa Ana, California 92704 USA
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SAFETY DATA SHEET

SECTION 1 – IDENTIFICATION

Chemical Name: Methane
Chemical Formula: CH4
Chemical Family: Flammable Gases
Hazard Classification: Methane, UN1972, Red Label
Product Use Description: Analytical Standard and General Laboratory Applications
Company: MESA Specialty Gases & Equipment
2427 South Anne Street
Santa Ana, California 92704 USA
Phone Number for Information: Infotrac
Emergency Contact: 800-535-5053 (Int'l: 352-323-3500)

SECTION 2 – HAZARD(S) IDENTIFICATION

SIGNAL WORD - DANGER

HAZARD STATEMENTS: Extremely flammable gas. Contains gas under pressure; may explode if heated.
May cause suffocation by displacing oxygen in the air.
May form explosive mixtures with air.
May cause frostbite.

PRECAUTIONARY STATEMENTS:
General: Use in accordance with Safety Data Sheets.
Do not ingest or inhale. Avoid contact with skin and clothing.
Prevention: Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.
Response: Leaking gas fire: Do not extinguish unless leak can be stopped safely.
In case of leakage, eliminate all ignition sources.
Do not open valve until prepared to use.
Always use a back flow preventative device in piping.
Storage: Protect from sunlight. Store in a well-ventilated place.

OTHER HAZARDS: High pressure gas. May cause rapid suffocation.
May cause dizziness, nausea, drowsiness, vomiting, excess salivation, loss of mobility/consciousness.
May react explosively even in absence of air at elevated pressure and/or temperature.
Self-contained breathing apparatus (SCBA) may be required.

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	CONCENTRATION
Methane	74-82-8	> 98.0%
Maximum Impurities		< 2.0%

SECTION 4 – FIRST AID MEASURES

ROUTE OF EXPOSURE:
Inhalation:
Remove victim(s) to fresh air as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Only trained personnel should administer supplemental oxygen.
Eye contact: Immediately flush eyes with plenty of water.
Skin contact: Immediately flush skin with plenty of water. Remove any contaminated clothing and shoes.
Ingestion: Do not induce vomiting unless instructed to do so by medical personnel. If conscious, drink plenty of water. Never give anything by mouth to an unconscious person.
Frostbite: place the frostbitten part in warm water. DO NOT USE HOT WATER. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit, Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention. Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s).

SYMPTOMS: High concentrations of this gas can cause an oxygen-deficient environment. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of overexposure, death may occur. Isobutylene also has some degree of anesthetic action and can be mildly irritating to the mucous membranes. The effects associated with various levels of oxygen are as follows:

CONCENTRATION SYMPTOMS OF EXPOSURE
12-16% Oxygen: Breathing and pulse rate increased, muscular coordination slightly disturbed.
10-14% Oxygen: Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen: Nausea and vomiting, collapse or loss of consciousness.
Below 6%: Convulsive movements, possible respiratory collapse, and death.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Overexposure to Methane may cause the following health effects:\
ACUTE: The most significant hazard associated with this gas is inhalation of oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, headache, dizziness, and nausea. At high concentrations, unconsciousness or death may occur. Contact with cryogenic liquid or rapidly expanding gases may cause frostbite.
CHRONIC: There are currently no known adverse health effects associated with chronic exposure to Methane.

TARGET ORGANS: Respiratory system.

HAZARDOUS MATERIAL INFORMATION SYSTEM

HEALTH	(BLUE)	1
FLAMMABILITY	(RED)	4
REACTIVITY	(YELLOW)	0
PROTECTIVE EQUIPMENT		B

EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8

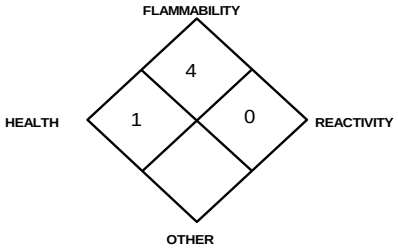
For routine industrial applications

SECTION 5 – FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: : Extinguish fires of this gas by shutting off the source of the gas. Use water spray to cool fire-exposed containers, structures, and equipment.

UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, this gas will ignite and produce toxic gases including carbon monoxide and carbon dioxide. An extreme explosion hazard exists in areas in which the gas has been released, but the material has not yet ignited.

NFPA RATING



DANGER! Fires impinging (direct flame) on the outside surface of unprotected pressure storage vessels of Methane can be very dangerous. Direct flame exposure on the cylinder wall can cause an explosion either by BLEVE (Boiling Liquid Expanding Vapor Explosion) or by exothermic decomposition. This is a catastrophic failure of the vessel releasing the contents into a massive fireball and explosion. The resulting fire and explosion can result in severe equipment damage and personnel injury or death over a large area around the vessel. For massive fires in large areas, use unmanned hose holder or monitor nozzles; if this is not possible, withdraw from area and allow fire to burn.

Explosion Sensitivity to Mechanical Impact: Not sensitive.
Explosion Sensitivity to Static Discharge: Static discharge may cause Methane to ignite explosively.

SPECIAL FIRE FIGHTING PROCEDURES: RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO METHANE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus and Fire-Retardant Personal Protective equipment should be worn. Adequate fire protection must be provided during rescue situations. Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. The best fire-fighting technique may be simply to let the burning gas escape from the pressurized cylinder, tank car, or pipeline. Stop the leak before extinguishing fire. If the fire is extinguished before the leak is sealed, the still-leaking gas could explosively re-ignite without warning and cause extensive damage, injury, or fatality. In this case, increase ventilation (in enclosed areas) to prevent flammable or explosive mixture formation. For large releases, consider evacuation. Refer to the North American Emergency Response Guidebook for additional information.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT, AND EMERGENCY PROCEDURES: Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Monitor oxygen level. Shut off gas supply if this can be done safely. Isolate and ventilate the area until gas has dispersed.
SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area, protect people, and respond with trained personnel. Adequate fire protection must be provided. Minimum Personal Protective Equipment should be Level B: fire-retardant protective clothing, gloves resistant to tears, and Self-Contained Breathing Apparatus. Use only non-sparking tools and equipment. Locate and seal the source of the leaking gas. Protect personnel attempting the shut-off with water-spray. Allow the gas, which is lighter than air, to dissipate. Liquid Methane, when exposed to the atmosphere, will produce a cloud of ice/fog in the air upon its release. A flammable mixture will exist within the vapor cloud, and it is advisable that personnel keep well outside the area of visible moisture. If cryogenic liquid is released, keep area clear and allow the liquid to evaporate. The gas that is then formed should be allowed to dissipate.

Monitor the surrounding area for combustible gas levels and oxygen. The atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Combustible gas concentration must be below 10% of the LEL (LEL = 5.0%) prior to entry. Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there.

THIS IS AN EXTREMELY FLAMMABLE GAS. Protection of all personnel and the area must be maintained.

ENVIRONMENTAL PRECAUTIONS: Prevent spreading of vapors through sewers, ventilation systems, and confined areas. Do not discharge materials into any place where their accumulation could be dangerous.

METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP: Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. Ventilate enclosed areas. Move leaking cylinder to fume hood or safe outdoor area. Use monitoring equipment if hazardous conditions are suspected or likely to occur.

SECTION 7 – HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING: : Protect cylinders against physical damage. Store in cool, dry, well-ventilated area, away from sources of heat, ignition and direct sunlight. Do not allow area where cylinders are stored to exceed 52□C (125□F). Isolate from oxidizers such as oxygen, chlorine, or fluorine. Use a check valve or trap in the discharge line to prevent hazardous backflow. Post "No Smoking or Open Flame" signs in storage and use areas. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Never tamper with pressure relief devices in valves and cylinders. Electrical equipment should be non-sparking or explosion proof. The following rules are applicable to work situations in which cylinders are being used:

Before Use: Move cylinders with a suitable hand truck. Do not drag, slide, or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap, if provided, in place until cylinder is ready for use.
During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.
After Use: Close main cylinder valve. Replace valve protection cap, if provided. Mark empty cylinders "EMPTY".

NOTE: Use only DOT or ASME code containers. Earth-ground and bond all lines and equipment associated with Methane. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, Safe Handling of Compressed Gases in Containers. Additionally, refer to CGA Bulletin SB-2 "Oxygen Deficient Atmospheres".

CONDITIONS FOR SAFE STORAGE: Cylinders should be secured with mounting brackets away from heavily traveled areas. Use oldest cylinders in stock first to prevent full cylinders from being stored for excessive periods of time. Full and empty cylinders should be segregated. Keep cylinder in dry, cool, well ventilated area away from heat, flame, sparks or corrosive chemicals. Cylinders should be moved by suitable hand trucks. Close valve after each use and when empty.Cylinder valve guards or caps should be in place. Keep cylinder at room temperature (21°C/ 70°F). Store containers in location free from fire risk and away from any sources of heat and ignition. Keep cylinder at least 20 feet away from combustible material, oxidizers, and Oxygen. Use equipment rated for cylinder pressure.

SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

COMPONENT	OSHA PEL	ACGIH TLV
Methane	None	1000 ppm

APPROPRIATE ENGINEERING CONTROLS: Use with adequate ventilation. Local exhaust ventilation is preferred, because it prevents Methane dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the presence of potentially explosive air-gas mixtures and the level of oxygen. Monitoring devices should be installed near the ceiling.

INDIVIDUAL PROTECTIVE MEASURES: Safety glasses, work gloves, and safety shoes should be worn when handling high pressure cylinders or hazardous materials. Avoid skin contact with leaking liquid (danger of frostbite). Wear suitable protective equipment. Ensure adequate ventilation, especially in confined areas. Do not eat, drink, or smoke when using. RESPIRATORY PROTECTION: Maintain oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen levels are below 19.5% or during emergency response to a release of Methane. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards.

EYE PROTECTION: Splash goggles or safety glasses, for protection from rapidly expanding gases and splashes of liquid Methane.

HAND PROTECTION: Wear gloves resistant to tears when handling cylinders of Methane. Use low-temperature protective gloves (e.g., Kevlar) when working with containers of liquid Methane.

BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product, as well as fire retardant items.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Colorless	Upper/lower flammability/explosive limits: No data available
Odor: odorless	Vapor Pressure: N/A
Odor threshold: N/A	Vapor Density (Air=1): 0.6784 kg/m3 (0.042 35 lb/ft3)
pH: N/A	Relative Density (Water=1): Varies
Melting point/range: N/A	Solubility (in water): Very slight.
Boiling point/range: -161°C (-258.7°F)	Partition coefficient (n-octanol/water): N/A
Flash Point: N/A	Auto-ignition temperature: No data available
Evaporation Rate (Butyl Acetate=1): N/A	Decomposition temperature: No data available
Flammability (solid, gas): No data available	Visocity: N/A

SECTION 10 – STABILITY AND REACTIVITY DATA

Reactivity: Highly reactive	**Conditions to avoid:** Contact with incompatible materials and exposure to heat, sparks, and other sources of ignition. Cylinders exposed to high temperatures or direct flame can rupture or burst.
Chemical Stability: Stable	**Incompatible materials:** Strong oxidizers (e.g., chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride).
Possibility of hazardous reactions: No data available	**Hazardous Decomposition or Byproducts:** When ignited in the presence of oxygen, this gas will burn to produce carbon monoxide, carbon dioxide.

SECTION 11 – TOXICOLOGICAL INFORMATION

LIKELY ROUTES OF EXPOSURE: N/A

SYMPTOMS/EFFECTS FROM EXPOSURE:
Eye contact : Contact with rapidly expanding gas may cause burns or frostbite.
Inhalation : No known significant effects or critical hazards.
Skin contact : Contact with rapidly expanding gas may cause burns or frostbite.
Ingestion : As this product is a gas, refer to the inhalation section.

Mutagenicity: No mutagenic effects have been described for Methane.
Embryotoxicity: No embryotoxic effects have been described for Methane.
Teratogenicity: No teratogenic effects have been described for Methane.
Reproductive Toxicity: No reproductive toxicity effects have been described for Methane.

ACUTE/CHRONIC TOXICITY: N/A

CARCINOGENICITY: May cause cancer depending on duration and level of exposure.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotocity (aquatic and terrestrial): When discharged in large quantities may contribute to the greenhouse effect.
Persistence and degradability: No data available
Bioaccumulative potential:
Log Pow: Not applicable. Log Kow: Not applicable.
Bioaccumulative potential : No ecological damage caused by this product.
Log Pow 1.09
Bioaccumulative potential : Not expected to bioaccumulate due to the low log Kow (log Kow < 4).

Mobility in soil: No data available

Other Effects: The mixture does not contain any class I or Class II ozone depleting chemicals.

SECTION 13 – DISPOSAL CONSIDERATIONS

Disposal: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Return cylinders with any residual product to MESA Specialty Gas & Equipment Inc. Do not dispose of locally.

SECTION 14 – TRANSPORTATION INFORMATION

DOT Classification:

Proper Shipping Name:	Methane, compressed
Class:	2.1
UN/ID No.:	UN1971
Label:	Flammable Gas, Red Label

IATA Classification:

Proper Shipping Name:	Methane, compressed
Class:	2.1
UN/ID No.:	UN1971
Label:	Flammable Gas, Red Label

Environment hazard: No

Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code: N/A

SPECIAL PRECAUTIONS FOR USER: Avoid transport on vehicles where the load space is not separated from driver's compartment. Ensure that transporter is aware of the potential hazards of the load and knows what to do in event of an emergency. Contact supplier for complete transportation information.

SECTION 15 – REGULATORY INFORMATION

Listed on the United States TSCA (Toxic Substances Control Act) inventory
SARA Section 311/312 Hazard Classes: Sudden release of pressure hazard
Fire hazard
All components of this product are listed on the Toxic Substances Control Act(TSCA) inventory.
This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.
International regulations: CANADA
Listed on the Canadian DSL (Domestic Substances List)
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EU-Regulations:
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
National regulations:
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

US State regulations:
U.S. - California - Proposition 65 - Carcinogens List: No
U.S. - California - Proposition 65 - Developmental Toxicity: No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female: No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male: No
State or local regulations U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

U.S. - California -Proposition 65 -Carcinogens List : No
U.S. - California -Proposition 65 -Developmental Toxicity: No
U.S. - California -Proposition 65 -Reproductive Toxicity -Female : No
U.S. - California -Proposition 65 -Reproductive Toxicity - Male : No
No significance risk level(NSRL)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

LABELING:
DANGER: EXTREMELY FLAMMABLE GAS. CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED. MAY CAUSE RAPID SUFFOCATION BY DISPLACING OXYGEN IN THE AIR. MAY FORM EXPLOSIVE MIXTURES WITH AIR. May cause dizziness, nausea, drowsiness, vomiting, excess salivation, and loss of mobility/consciousness. May react explosively even in absence of air at elevated pressure and/or temperature. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources—No smoking. Use and store in well-ventilated areas. Leaking gas fire: Do not extinguish unless leak can be stopped safely. In case of leakage, eliminate all ignition sources. Do not open valve until prepared to use. Always use a backflow preventative device in piping. Use only with equipment rated for cylinder pressure. Close valve after each use and when empty. Cylinder temperature should not exceed 52°C (125°F). Use in accordance with Safety Data Sheet. FIRST AID: IF INHALED, remove to fresh air. If breathing is difficult, give Oxygen. Call a physician. IN CASE OF FROSTBITE, obtain immediate medical attention. DO NOT REMOVE THIS LABEL.

SECTION 16 – OTHER INFORMATION

Information contained in this data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable. But the accuracy and completeness thereof, is not guaranteed and no warranty of any kind, either expressed or implied, is made with respect thereto. Since MESA Specialty Gases and Equipment Division of MESA International Technologies, Inc. shall have no control over the use of the product described herein, we assume no liability for loss or damage incurred from the proper or improper use of such product.

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DISCLAIMER

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