

# MATERIAL SAFETY DATA SHEET

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## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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**MATHESON TRI-GAS, INC.**  
**150 Allen Road Suite 302**  
**Basking Ridge, New Jersey 07920**  
**Information: 1-800-416-2505**

**Emergency Contact:**  
**CHEMTREC 1-800-424-9300**  
**Calls Originating Outside the US:**  
**703-527-3887 (Collect Calls Accepted)**

**SUBSTANCE: CALIBRATION GAS**

**TRADE NAMES/SYNONYMS:**  
00203305

**CREATION DATE:** Jul 13 1999  
**REVISION DATE:** Dec 11 2008

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## 2. COMPOSITION, INFORMATION ON INGREDIENTS

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**COMPONENT: METHANE**  
**CAS NUMBER:** 74-82-8  
**PERCENTAGE:** 75-90

**COMPONENT: ETHANE**  
**CAS NUMBER:** 74-84-0  
**PERCENTAGE:** 3-10

**COMPONENT: PROPANE**  
**CAS NUMBER:** 74-98-6  
**PERCENTAGE:** 1-5

**COMPONENT: CARBON DIOXIDE, GAS**  
**CAS NUMBER:** 124-38-9  
**PERCENTAGE:** 0.5-5

**COMPONENT: NITROGEN, COMPRESSED GAS**  
**CAS NUMBER:** 7727-37-9  
**PERCENTAGE:** 1-5

**COMPONENT: N-BUTANE**  
**CAS NUMBER:** 106-97-8  
**PERCENTAGE:** 0.1-3

**COMPONENT:** ISOBUTANE  
**CAS NUMBER:** 75-28-5  
**PERCENTAGE:** 0.1-3

**COMPONENT:** PENTANE  
**CAS NUMBER:** 109-66-0  
**PERCENTAGE:** 0.1-3

**COMPONENT:** ISOPENTANE  
**CAS NUMBER:** 78-78-4  
**PERCENTAGE:** 0.1-3

**COMPONENT:** HEPTANE  
**CAS NUMBER:** 142-82-5  
**PERCENTAGE:** 0.01-2

**COMPONENT:** N-HEXANE  
**CAS NUMBER:** 110-54-3  
**PERCENTAGE:** 0.05-1

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### 3. HAZARDS IDENTIFICATION

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**NFPA RATINGS (SCALE 0-4):** HEALTH=2 FIRE=4 REACTIVITY=0



**EMERGENCY OVERVIEW:**

**PHYSICAL FORM:** compressed gas

**MAJOR HEALTH HAZARDS:** respiratory tract irritation, skin irritation, eye irritation, aspiration hazard, central nervous system depression, difficulty breathing, nerve damage

**PHYSICAL HAZARDS:** Flammable gas. May cause flash fire.

**POTENTIAL HEALTH EFFECTS:**

**INHALATION:**

**SHORT TERM EXPOSURE:** irritation, nausea, vomiting, dizziness, tingling sensation, suffocation, convulsions, coma

**LONG TERM EXPOSURE:** irritation, nausea, vomiting, difficulty breathing, irregular heartbeat, headache, drowsiness, dizziness, disorientation, mood swings, muscle cramps, loss of coordination, visual disturbances, impotence, suffocation, lung congestion, blood disorders, nerve damage, paralysis, brain damage, convulsions, unconsciousness, coma

**SKIN CONTACT:**

**SHORT TERM EXPOSURE:** no information on significant adverse effects

**LONG TERM EXPOSURE:** irritation, skin disorders

**EYE CONTACT:**

**SHORT TERM EXPOSURE:** no information on significant adverse effects

**LONG TERM EXPOSURE:** irritation

**INGESTION:**

**SHORT TERM EXPOSURE:** ingestion of harmful amounts is unlikely

**LONG TERM EXPOSURE:** ingestion of harmful amounts is unlikely

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#### 4. FIRST AID MEASURES

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**INHALATION:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

**SKIN CONTACT:** Wash exposed skin with soap and water.

**EYE CONTACT:** Flush eyes with plenty of water.

**INGESTION:** If a large amount is swallowed, get medical attention.

**NOTE TO PHYSICIAN:** For inhalation, consider oxygen.

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#### 5. FIRE FIGHTING MEASURES

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**FIRE AND EXPLOSION HAZARDS:** Severe fire hazard. Containers may rupture or explode if exposed to heat.

**EXTINGUISHING MEDIA:** carbon dioxide, regular dry chemical, regular foam, water

**FIRE FIGHTING:** Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

**FLASH POINT:** -369 F (-223 C) (METHANE)

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#### 6. ACCIDENTAL RELEASE MEASURES

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**OCCUPATIONAL RELEASE:**

Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

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#### 7. HANDLING AND STORAGE

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**STORAGE:** Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. See original container for storage recommendations. Keep separated from incompatible substances.

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## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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### **EXPOSURE LIMITS:**

#### **METHANE:**

No occupational exposure limits established.

#### **ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4):**

1000 ppm ACGIH TWA

#### **ETHANE:**

No occupational exposure limits established.

#### **ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4):**

1000 ppm ACGIH TWA

#### **PROPANE:**

1000 ppm (1800 mg/m<sup>3</sup>) OSHA TWA

1000 ppm (1800 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

#### **LIQUIFIED PETROLEUM GAS (LPG):**

1000 ppm (1800 mg/m<sup>3</sup>) OSHA TWA

1000 ppm (1800 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

#### **ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4):**

1000 ppm ACGIH TWA

#### **CARBON DIOXIDE, GAS:**

##### **CARBON DIOXIDE:**

5000 ppm (9000 mg/m<sup>3</sup>) OSHA TWA

10000 ppm (18000 mg/m<sup>3</sup>) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

30000 ppm (54000 mg/m<sup>3</sup>) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

5000 ppm ACGIH TWA

30000 ppm ACGIH STEL

5000 ppm (9000 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

30000 ppm (54000 mg/m<sup>3</sup>) NIOSH recommended STEL

#### **NITROGEN, COMPRESSED GAS:**

##### **NITROGEN:**

ACGIH (simple asphyxiant)

#### **N-BUTANE:**

800 ppm (1900 mg/m<sup>3</sup>) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

800 ppm (1900 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

**LIQUIFIED PETROLEUM GAS (LPG):**

1000 ppm (1800 mg/m<sup>3</sup>) OSHA TWA

1000 ppm (1800 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

**ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4):**

1000 ppm ACGIH TWA

**ISOBUTANE:**

800 ppm (1900 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

**LIQUIFIED PETROLEUM GAS (LPG):**

1000 ppm (1800 mg/m<sup>3</sup>) OSHA TWA

1000 ppm (1800 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

**ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4):**

1000 ppm ACGIH TWA

**PENTANE:**

1000 ppm (2950 mg/m<sup>3</sup>) OSHA TWA

600 ppm (1770 mg/m<sup>3</sup>) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

750 ppm (2210 mg/m<sup>3</sup>) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

600 ppm ACGIH TWA

120 ppm (350 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

610 ppm (1800 mg/m<sup>3</sup>) NIOSH recommended ceiling 15 minute(s)

**ISOPENTANE:**

600 ppm ACGIH TWA

**HEPTANE:**

**n-HEPTANE:**

500 ppm (2000 mg/m<sup>3</sup>) OSHA TWA

400 ppm (1640 mg/m<sup>3</sup>) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

500 ppm (2050 mg/m<sup>3</sup>) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

85 ppm (350 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

440 ppm (1800 mg/m<sup>3</sup>) NIOSH recommended ceiling 15 minute(s)

**HEPTANE, ALL ISOMERS:**

400 ppm ACGIH TWA

500 ppm ACGIH STEL

**N-HEXANE:**

500 ppm (1800 mg/m<sup>3</sup>) OSHA TWA

50 ppm (180 mg/m<sup>3</sup>) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

50 ppm ACGIH TWA (skin)

50 ppm (180 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

**VENTILATION:** Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

**EYE PROTECTION:** Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

**CLOTHING:** Wear appropriate chemical resistant clothing.

**GLOVES:** Wear appropriate chemical resistant gloves.

**RESPIRATOR:** Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.

**For Unknown Concentrations or Immediately Dangerous to Life or Health -**

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**PHYSICAL STATE:** gas

**PHYSICAL FORM:** compressed gas

**ODOR:** Not available

**BOILING POINT:** -260 F (-162 C) (METHANE)

**FREEZING POINT:** -297 F (-183 C) (METHANE)

**VAPOR PRESSURE:** 760 mmHg @ -161 C (METHANE)

**VAPOR DENSITY (air=1):** 0.555 (METHANE)

**DENSITY:** Not available

**WATER SOLUBILITY:** Not available

**PH:** Not applicable

**VOLATILITY:** Not applicable

**ODOR THRESHOLD:** Not available

**EVAPORATION RATE:** Not applicable

**COEFFICIENT OF WATER/OIL DISTRIBUTION:** Not applicable

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## 10. STABILITY AND REACTIVITY

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**REACTIVITY:** Stable at normal temperatures and pressure.

**CONDITIONS TO AVOID:** Avoid heat, flames, sparks and other sources of ignition. Minimize contact

with material. Containers may rupture or explode if exposed to heat.

**INCOMPATIBILITIES:** halogens, combustible materials, oxidizing materials

**HAZARDOUS DECOMPOSITION:**

Thermal decomposition products: oxides of carbon

**POLYMERIZATION:** Will not polymerize.

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## 11. TOXICOLOGICAL INFORMATION

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**METHANE:**

**TOXICITY DATA:** 326 gm/m<sup>3</sup>/2 hour(s) inhalation-mouse LC<sub>50</sub>

**ACUTE TOXICITY LEVEL:**

Slightly Toxic: inhalation

**ETHANE:**

**ADDITIONAL DATA:** Stimulants such as epinephrine may induce ventricular fibrillation.

**PROPANE:**

**TARGET ORGANS:** central nervous system

**ADDITIONAL DATA:** Stimulants such as epinephrine may induce ventricular fibrillation.

**CARBON DIOXIDE, GAS:**

**TOXICITY DATA:** 470000 ppm/30 minute(s) inhalation-rat LC<sub>50</sub>

**ACUTE TOXICITY LEVEL:**

Relatively Non-toxic: inhalation

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** heart or cardiovascular disorders, respiratory disorders

**REPRODUCTIVE EFFECTS DATA:** Available.

**N-BUTANE:**

**TOXICITY DATA:** 658 gm/m<sup>3</sup>/4 hour(s) inhalation-rat LC<sub>50</sub>

**ACUTE TOXICITY LEVEL:**

Relatively Non-toxic: inhalation

**TARGET ORGANS:** central nervous system

**ADDITIONAL DATA:** Stimulants such as epinephrine may induce ventricular fibrillation.

**ISOBUTANE:**

**TOXICITY DATA:** 57 pph/15 minute(s) inhalation-rat LC<sub>50</sub>

**LOCAL EFFECTS:**

Irritant: inhalation

**ACUTE TOXICITY LEVEL:**

Relatively Non-toxic: inhalation

**TARGET ORGANS:** central nervous system

**ADDITIONAL DATA:** Stimulants such as epinephrine may induce ventricular fibrillation.

**PENTANE:**

**TOXICITY DATA:** 364 gm/m<sup>3</sup>/4 hour(s) inhalation-rat LC<sub>50</sub>; >2000 mg/kg oral-rat LD<sub>50</sub>

**LOCAL EFFECTS:**

Irritant: inhalation, skin

**ACUTE TOXICITY LEVEL:**

Relatively Non-toxic: inhalation

**TARGET ORGANS:** central nervous system

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** respiratory disorders, skin disorders and allergies

**ADDITIONAL DATA:** Alcohol may enhance the toxic effects.

**ISOPENTANE:**

**TOXICITY DATA:** 280000 mg/m<sup>3</sup>/4 hour(s) inhalation-rat LC<sub>50</sub>

**LOCAL EFFECTS:**

Irritant: inhalation, skin, eye

**ACUTE TOXICITY LEVEL:**

Relatively Non-toxic: inhalation

**TARGET ORGANS:** central nervous system

**ADDITIONAL DATA:** Alcohol may enhance the toxic effects. Stimulants such as epinephrine may induce ventricular fibrillation.

**HEPTANE:**

**TOXICITY DATA:** 103 gm/m<sup>3</sup>/4 hour(s) inhalation-rat LC<sub>50</sub>

**LOCAL EFFECTS:**

Irritant: inhalation, skin, eye

**ACUTE TOXICITY LEVEL:**

Slightly Toxic: inhalation

**TARGET ORGANS:** central nervous system

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** respiratory disorders, skin disorders and allergies

**ADDITIONAL DATA:** Stimulants such as epinephrine may induce ventricular fibrillation.

**N-HEXANE:**

**IRRITATION DATA:** 10 mg eyes-rabbit mild

**TOXICITY DATA:** >3367 ppm inhalation-rat LC<sub>50</sub>; >2 gm/kg skin-rabbit LD<sub>50</sub>; >5 gm/kg oral-rat LD<sub>50</sub>

**LOCAL EFFECTS:**

Irritant: inhalation, skin, eye

**ACUTE TOXICITY LEVEL:**

Slightly Toxic: inhalation

Relatively Non-toxic: ingestion

**TARGET ORGANS:** nervous system

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** kidney disorders, liver disorders, respiratory disorders, skin disorders and allergies

**TUMORIGENIC DATA:** Available.

**MUTAGENIC DATA:** Available.



**REPRODUCTIVE EFFECTS DATA:** Available.

**ADDITIONAL DATA:** Alcohol may enhance the toxic effects.

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## 12. ECOLOGICAL INFORMATION

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Not available

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## 13. DISPOSAL CONSIDERATIONS

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Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

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## 14. TRANSPORT INFORMATION

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**U.S. DOT 49 CFR 172.101:**

**PROPER SHIPPING NAME:** Methane, compressed

**ID NUMBER:** UN1971

**HAZARD CLASS OR DIVISION:** 2.1

**LABELING REQUIREMENTS:** 2.1

**QUANTITY LIMITATIONS:**

**PASSENGER AIRCRAFT OR RAILCAR:** Forbidden

**CARGO AIRCRAFT ONLY:** 150 kg



**CANADIAN TRANSPORTATION OF DANGEROUS GOODS:**

**SHIPPING NAME:** Methane, compressed

**UN NUMBER:** UN1971

**CLASS:** 2.1

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## 15. REGULATORY INFORMATION

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**U.S. REGULATIONS:**

**CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):**

**N-HEXANE:** 5000 LBS RQ

**SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B):** Not regulated.

**SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C):** Not regulated.

**SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):**

ACUTE: Yes  
CHRONIC: Yes  
FIRE: Yes  
REACTIVE: No  
SUDDEN RELEASE: Yes

**SARA TITLE III SECTION 313 (40 CFR 372.65):  
N-HEXANE**

**OSHA PROCESS SAFETY (29 CFR 1910.119):** Not regulated.

**STATE REGULATIONS:**

**California Proposition 65:** Not regulated.

**CANADIAN REGULATIONS:**

**WHMIS CLASSIFICATION:** Not determined.

**NATIONAL INVENTORY STATUS:**

**U.S. INVENTORY (TSCA):** Listed on inventory.

**TSCA 12(b) EXPORT NOTIFICATION:**

**PENTANE**

**CAS NUMBER:** 109-66-0

**SECTION 4**

**HEPTANE**

**CAS NUMBER:** 142-82-5

**SECTION 4**

**CANADA INVENTORY (DSL/NDSL):** Not determined.

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## 16. OTHER INFORMATION

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