### 1. CORRECTIVE RESPONSE ACTIONS

**Stop discharge**

**Chemical and Physical Treatment:** Burn

### 2. CHEMICAL DESIGNATIONS

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<th>CG Compatibility Group</th>
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<td>Standard Industrial Trade Classification</td>
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### 3. HEALTH HAZARDS

#### 3.1 Personal Protective Equipment
Self-contained breathing apparatus; safety goggles.

#### 3.2 Symptoms Following Exposure
Central nervous system depression ranging from dizziness and incoordination to anesthesia and respiratory arrest, depending on concentration and extent of inhalation.

#### 3.3 Treatment of Exposure
**INHALATION:** protect victim against self-injury if he is stuporous, confused, or anesthetized; apply artificial respiration if breathing has stopped, avoid administration of epinephrine or other sympathomimetic amines; prevent aspiration of vomitus by proper positioning of head; give symptomatic and supportive treatment. INJECTION OR ASPIRATION: no treatment required.

#### 3.4 TLV-TWA
Not listed.

#### 3.5 TLV-STEL
Not listed.

#### 3.6 TLV-Ceiling
Not listed.

#### 3.7 Toxicity by Inhalation
Not pertinent.

#### 3.8 Toxicity by Inhalation
Currently not available.

#### 3.9 Chronic Toxicity
None.

#### 3.10 Vapor (Gas) Irritant Characteristics
None.

#### 3.11 Liquid or Solid Characteristics
None.

#### 3.12 Odor Threshold
Currently not available.

#### 3.13IDLH Value
Not listed.

#### 3.14 OSHA PEL-TWA
Not listed.

#### 3.15 OSHA PEL-STEL
Not listed.

#### 3.16 OSHA PEL-Ceiling
Not listed.

#### 3.17 EPA AEGL
Not listed.

### 4. FIRE HAZARDS

#### 4.1 Flash Point
-17°F C.C.

#### 4.2 Flammable Limits in Air
1.8%-8.4%

#### 4.3 Fire Extinguishing Agents
Stop flow of gas

#### 4.4 Fire Extinguishing Agents Not to Be Used
Not pertinent

#### 4.5 Special Hazards of Combustion
Products: Not pertinent

#### 4.6 Behavior on Fire
Not pertinent

#### 4.7 Auto Ignition Temperature
850°F

#### 4.8 Electrical Hazards
Not pertinent

#### 4.9 Burning Rate
9.3 mm/min

#### 4.10 Abiabatic Flame Temperature
Currently not available

#### 4.11 Stoichiometric Air to Fuel Ratio
30.9 (calc.)

#### 4.12 Flame Temperature
Currently not available

#### 4.13 Combustion Molar Ratio (Reactant to Product)
9.0 (calc.)

#### 4.14 Minimum Oxygen Concentration for Combustion
Not listed

### 5. CHEMICAL REACTIVITY

#### 5.1 Reactivity with Water
No reaction

#### 5.2 Reactivity with Common Materials
No reaction

#### 5.3 Stability During Transport
Stable

#### 5.4 Neutralizing Agents for Acids and Caustics
Not pertinent

#### 5.5 Polymerization
Not pertinent

#### 5.6 Inhibitor of Polymerization
Not pertinent

### 6. WATER POLLUTION

#### 6.1 Aquatic Toxicity
None

#### 6.2 Waterford Toxicity
None

#### 6.3 Biological Oxygen Demand (BOD)
None

#### 6.4 Food Chain Concentration Potential
None

#### 6.5 GESAMP Hazard Profile
Not listed

### 7. SHIPPING INFORMATION

#### 7.1 Grades of Purity
Pure; technical

#### 7.2 Storage Temperature
Ambient

#### 7.3 Invert Atmosphere
No requirement

#### 7.4 Venting
Safety relief

#### 7.5 IMO Pollution Category
Currently not available

#### 7.6 Ship Type
2

#### 7.7 Barge Hull Type
Currently not available

### 8. HAZARD CLASSIFICATIONS

#### 8.1 48 CFR Category
Flammable gas

#### 8.2 49 CFR Class
2.1

#### 8.3 49 CFR Package Group
Not pertinent.

#### 8.4 Marine Pollutant
Not listed.

#### 8.5 NFA Hazard Classification:
Not pertinent

#### 8.6 EPA Reportable Quantity
Not listed.

#### 8.7 EPA Pollution Category
Not listed.

#### 8.8 RORA Waste Number
Not listed.

#### 8.9 EPA FWPCA List
Not listed.

### 9. PHYSICAL & CHEMICAL PROPERTIES

#### 9.1 Physical State at 15°C and 1 atm
Gas

#### 9.2 Molecular Weight
58.12

#### 9.3 Boiling Point at 1 atm
10.8°F = -11.8°C = 261.4 K

#### 9.4 Freezing Point
-427.5°F = -255.3°C = 17.9°K

#### 9.5 Critical Temperature
275.0°F = 135°C = 408.2°K

#### 9.6 Critical Pressure
529 psia = 36.0 atm = 3.65 MPa

#### 9.7 Specific Gravity
0.557 at 20°C (liquid)

#### 9.8 Liquid Surface Tension
14 dynes/cm = 0.014 N/m at -10°C

#### 9.9 Liquid Water Interfacial Tension
Not pertinent

#### 9.10 Vapor (Gas) Specific Gravity
2.0

#### 9.11 Ratio of Specific Heats of Vapor (Gas)
1.055

#### 9.12 Latent Heat of Vaporization
158 Btu/lb = 87.5 cal/g = 3.68 X 10^7 J/kg

#### 9.13 Heat of Combustion
–19.498 Btu/lb = –10,810 cal/g = –452.59 X 10^7 J/kg

#### 9.14 Heat of Decomposition
Not pertinent

#### 9.15 Heat of Solution
Not pertinent

#### 9.16 Heat of Polymerization
Not pertinent

#### 9.17 Heat of Fusion
18.96 cal/g

#### 9.18 Limiting Values
Currently not available

#### 9.19 Reid Vapor Pressure
Currently not available

### CAUTIONARY RESPONSE INFORMATION

<table>
<thead>
<tr>
<th>Common Synonyms</th>
<th>2-Methylpropane</th>
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<tbody>
<tr>
<td>Wet and Cold</td>
<td>Liquefied compressed</td>
</tr>
<tr>
<td>Gas</td>
<td>Floats and boils on water. Flammable. Visible vapor cloud is produced.</td>
</tr>
<tr>
<td>Fire</td>
<td>FLAMMABLE. Flashback along vapor trail may occur.</td>
</tr>
<tr>
<td>Vapor</td>
<td>Irritating to eyes. If inhaled, will cause dizziness, difficulty breathing, or loss of consciousness.</td>
</tr>
<tr>
<td>Water</td>
<td>Not harmful to aquatic life.</td>
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</table>

### Exposure

**CALL FOR MEDICAL AID.**

**VAPOR**

- Irritating to eyes.
- If inhaled, will cause dizziness, difficulty breathing, or loss of consciousness.
- Move to fresh air.
- If breathing has stopped, give artificial respiration.
- For dogs or anesthetized; apply artificial respiration if breathing has stopped; avoid administration of epinephrine or other sympathomimetic amines; prevent aspiration of vomitus by proper positioning of head; give symptomatic and supportive treatment. INJECTION OR ASPIRATION: no treatment required.

**INHALATION:** protect victim against self-injury if he is stuporous, confused, or anesthetized; apply artificial respiration if breathing has stopped, avoid administration of epinephrine or other sympathomimetic amines; prevent aspiration of vomitus by proper positioning of head; give symptomatic and supportive treatment.

**INJECTION OR ASPIRATION:** no treatment.

**NOTES**

**9.13 Heat of Combustion:**

- –10,810 cal/g = –452.59 X 10^7 J/kg

**9.12 Latent Heat of Vaporization:**

- 158 Btu/lb = 87.5 cal/g = 3.68 X 10^7 J/kg

**9.13 Heat of Combustion:**

- –19.498 Btu/lb = –10,810 cal/g = –452.59 X 10^7 J/kg

**9.14 Heat of Decomposition:**

- Not pertinent

**9.15 Heat of Solution:**

- Not pertinent

**9.16 Heat of Polymerization:**

- Not pertinent

**9.17 Heat of Fusion:**

- 18.96 cal/g

**9.18 Limiting Values:**

- Currently not available

**9.19 Reid Vapor Pressure:**

- Currently not available

**JUNE 1999**
### ISOBUTANE

<table>
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<tr>
<th>Temperature (degrees F)</th>
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<th>LIQUID THERMAL CONDUCTIVITY</th>
<th>LIQUID VISCOSITY</th>
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### 9.24 SOLUBILITY IN WATER

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<th>Pounds per 100 pounds of water</th>
<th>Temperature (degrees F)</th>
<th>Pounds per square inch</th>
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### JUNE 1999

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<th>Temperature (degrees F)</th>
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<th>SATURATED VAPOR DENSITY</th>
<th>IDEAL GAS HEAT CAPACITY</th>
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