PRODUCT INFORMATION

PRODUCT: Hydrogen 25% in Nitrogen

TRADE NAME: None

CHEMICAL NAME: Hydrogen in Nitrogen gas mixture

SYNONYMS: None

FORMULA: H₂ in N₂ gas mixture

CHEMICAL FAMILY: Gas mixture

SUPPLIER’S NAME: MEGS Inc.

SUPPLIER’S ADDRESS: 2675 De Miniac
                            Ville St-Laurent, Qc, H4S 1E5

EMERGENCY PHONE NUMBER: (514) 956-7503

MOLECULAR WEIGHT: 21.5

PRODUCT USE: Various

PRODUCT IDENTIFICATION NUMBER: UN 1954, Compressed gases, flammable, n.o.s.

HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>CHEMICAL ID</th>
<th>CONCENTRATION</th>
<th>CAS #</th>
<th>LD(50)</th>
<th>LC(50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen</td>
<td>25%</td>
<td>1333-74-0</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>75%</td>
<td>7727-37-9</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

PHYSICAL DATA

PHYSICAL STATE: Gas

APPEARANCE: Colorless gas

ODOR: Odorless

ODOR THRESHOLD: Not applicable

SPECIFIC GRAVITY (H₂O = 1): See Vapor Density (air = 1)

VAPOR PRESSURE: Not applicable (gas)
VAPOR DENSITY (air = 1): 0.74

EVAPORATION RATE: Not applicable (gas)

BOILING POINT: N₂ = -195.8°C; H₂ = -252.77°C
FREEZING POINT: N₂ = -210°C; H₂ = -259.2°C

pH: Not applicable

GAS DENSITY: 0.91 kg/m³ @ 15°C, 101.3 kPa

COEFFICIENT OF WATER/OIL DISTRIBUTION: @ 15°C, Bunsen Coefficient
N₂ = 0.0170; H₂ = 0.0185

FIRE OR EXPLOSION HAZARD

CONDITIONS OF FLAMMABILITY: Flammable gas mixture

MEANS OF EXTINCTION: Water, carbon dioxide, dry chemical. "Stop flow of gas before extinguishing fire".

FLASHPOINT AND METHOD OF DETERMINATION: Not applicable

UPPER EXPLOSION LIMIT (% BY VOL): Unknown
LOWER EXPLOSION LIMIT (% BY VOL): Unknown

AUTO-IGNITION TEMPERATURE: For H₂ = 570°C

FLAMMABILITY CLASSIFICATION: Class 1, Group B (electrical)

HAZARDOUS COMBUSTION PRODUCTS: None

EXPLOSION DATA: Yes with most oxidizers

SENSITIVITY TO STATIC DISCHARGE: Unknown

REACTIVITY DATA

CHEMICAL STABILITY: Stable

INCOMPATIBLE MATERIALS: None

CONDITIONS OF REACTIVITY: Non-reactive

HAZARDOUS DECOMPOSITION PRODUCTS: None

TOXICOLOGICAL PROPERTIES

ROUTES OF ENTRY:

SKIN CONTACT: None

SKIN ABSORPTION: None
**EYE:** None

**INHALATION:** High concentration of this mixture so as to exclude an adequate supply of oxygen to the lungs causes dizziness, deeper breathing due to air hunger, possible nausea and eventual unconsciousness.

**INGESTION:** None

**ACUTE OVER EXPOSURE EFFECTS:** This mixture is inactive biologically and essentially nontoxic; therefore, the major property is the exclusion of an adequate supply of oxygen to the lungs.

**CHRONIC OVER EXPOSURE EFFECTS:** None

**EXPOSURE LIMITS:** No TWA is established. The gas mixture is a simple asphyxiant. Oxygen levels should be maintained at greater than 18 molar percent at normal atmospheric pressure which is equivalent to a partial pressure of 135 mm Hg (ACGIH, 1995-1996).

**IRRITANCY OF PRODUCT:** None

**SENSITIZATION TO MATERIAL:** None

**CARCINOGENICITY, REPRODUCTIVE EFFECTS:** None

**TERATOGENICITY, MUTAGENICITY:** None

**TOXICOLOGICALY SYNERGISTIC PRODUCTS:** None

### PREVENTIVE MEASURES

**PERSONAL PROTECTIVE EQUIPMENT:** Appropriate gloves, clothing, apron, etc. when welding. Safety goggles or glasses. When welding wear helmet or use face shield with appropriate filter lens. Safety shoes.

**SPECIFIC ENGINEERING CONTROLS:** This gas mixture is noncorrosive and may be used with any common structural material. Systems must be designed to adequately handle the pressures involved. Hydrogen may cause embrittlement of some materials over a period of time especially at higher temperatures.

**LEAK AND SPILL PROCEDURES:** EVACUATE ALL PERSONNEL FROM AFFECTED AREA. Use appropriate protective equipment. If leak is on container or container valve, contact the closest MEGS location.
**WASTE DISPOSAL:** Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to MEGS for proper disposal. For emergency disposal, contact the closest MEGS location.

**HANDLING PROCEDURES AND EQUIPMENT:** USE ONLY IN WELL-VENTILATED AREAS.
Valve protection caps must remain in place unless container is secured with valve outlet piped to the point of use. Do not drag, slide, drop or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Keep cylinder away from heat and flame. Do not tamper with (valve) safety device. Close valve after each use and when empty.

**STORAGE REQUIREMENTS:** Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 52°C. Cylinders must be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time.

**TDG CLASSIFICATION:** 2.1

**WHMIS CLASSIFICATION:** A, B1

**SPECIAL SHIPPING INFORMATION:** Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

**FIRST AID MEASURES**

**SPECIFIC FIRST AID PROCEDURES:** PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO THIS GAS MIXTURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

**INHALATION:** Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.
**EYE CONTACT:** Not applicable

**SKIN CONTACT:** Not applicable

### PREPARATION INFORMATION

**PREPARED BY:** Safety Department

**DATE PREPARED:** 10/27/1999

**LAST REVISION DATE:** 02/01/2002

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