

GE

Section 1: Product and Company Identification

General Air Svcs.

6330 Colorado Blvd., Commerce City, CO, 80022

Product Code: H2 n2

Synonyms:

Recommended Use:

Usage Restrictions:

Section 2: Hazards Identification



Danger

| | |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Hazard Classification: | Gases Under Pressure Flammable (Category 1) |
| Hazard Statements: | Contains gas under pressure; may explode if heated Extremely flammable gas |
| Precautionary Statements | |
| Prevention: | Keep away from heat/sparks/open flames/hot surfaces. - No smoking. |
| Response: | Eliminate all ignition sources if safe to do so. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. |
| Storage: | Protect from sunlight. Store in well-ventilated place. |

Section 3: Composition/Information on Ingredients

| | CAS # | Concentration |
|----------|-----------|---------------|
| Hydrogen | 1333-74-0 | 7.0% |
| Nitrogen | 7727-37-9 | Balance |

| | Chemical Substance | Chemical Family | Trade Names |
|----------|--------------------------|-----------------|---------------------------------------------------------------------------------|
| Hydrogen | HYDROGEN | Inorganic gases | HYDROGEN GAS; HYDROGEN COMPRESSED; HYDROGEN (H2); DIHYDROGEN; UN 1049; H2 |
| Nitrogen | NITROGEN, COMPRESSED GAS | Inorganic gases | DIATOMIC NITROGEN; DINITROGEN; NITROGEN; NITROGEN-14; NITROGEN GAS; UN 1066; N2 |

Section 4: First Aid Measures

| | Skin Contact | Eye Contact | Ingestion | Inhalation | Note to Physicians |
|----------|----------------------------------------|----------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Hydrogen | Wash exposed skin with soap and water. | Flush eyes with plenty of water. | If a large amount is swallowed, get medical attention. | 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. | For inhalation, consider oxygen. |
| Nitrogen | Wash exposed skin with soap and water. | Flush eyes with plenty of water. | If a large amount is swallowed, get medical attention. | 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. | For inhalation, consider oxygen. |

Section 5: Fire Fighting Measures

| | Suitable Extinguishing Media | Products of Combustion | Protection of Firefighters |
|-----------------|----------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hydrogen | Carbon dioxide, regular dry chemical Large fires: Flood with fine water spray. | None known | <ul style="list-style-type: none"> Any self-contained breathing apparatus with a full facepiece. Any self-contained breathing apparatus with a full facepiece. |
| Nitrogen | Non-flammable. Use suitable extinguishing media for surrounding fire. Cylinders may rupture or explode if exposed to heat. | Non-flammable | <ul style="list-style-type: none"> Respiratory protection may be needed for frequent or heavy exposure. |

Section 6: Accidental Release Measures

| | Personal Precautions | Environmental Precautions | Methods for Containment |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|
| Hydrogen | Keep unnecessary people away, isolate hazard area and deny entry. Do not touch spilled material. Ventilate closed spaces before entering. | Avoid heat, flames, sparks and other sources of ignition. | Reduce vapors with water spray. Remove sources of ignition. |
| Nitrogen | Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. | No significant effects from contamination expected. | Stop leak if possible without personal risk. |

| | Methods for Cleanup | Other Information |
|-----------------|----------------------------------------------|-------------------|
| Hydrogen | Stop leak if possible without personal risk. | None |
| Nitrogen | N/A | N/A |

Section 7: Handling and Storage

| | Handling | Storage |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Hydrogen | 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. | Keep separated from incompatible substances. |
| Nitrogen | Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. | Keep separated from incompatible substances. |

Section 8: Exposure Controls/Personal Protection

| | Exposure Guidelines |
|-----------------|---------------------------------------------------------------|
| Hydrogen | HYDROGEN: ACGIH (simple asphyxiant) |
| Nitrogen | NITROGEN, COMPRESSED GAS: NITROGEN: ACGIH (simple asphyxiant) |

Engineering Controls

Handle only in fully enclosed systems.

| | Eye Protection | Skin Protection | Respiratory Protection |
|-----------------|-----------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Hydrogen | Eye protection not required, but recommended. | Protective clothing is not required. Wear appropriate chemical resistant gloves. | Any self-contained breathing apparatus with a full facepiece. |
| Nitrogen | Eye protection not required, but recommended. | Protective clothing is not required. Protective gloves are not required. | Respiratory protection may be needed for frequent or heavy exposure. |

General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

Section 9: Physical and Chemical Properties

| | Physical State | Appearance | Color | Change in Appearance | Physical Form | Odor |
|----------|----------------|------------|-----------|----------------------|---------------|----------|
| Hydrogen | Gas | Colorless | Colorless | N/A | Gas | Odorless |
| Nitrogen | Gas | Clear | Colorless | N/A | Gas | Odorless |

| | Taste | Flash Point | Flammability | Partition Coefficient | Autoignition Temperature | Upper Explosive Limits |
|----------|-----------|---------------------------------------------------|---------------|-----------------------|--------------------------|------------------------|
| Hydrogen | Tasteless | Flammable gas (burns at all ambient temperatures) | Not available | Not available | 752 F (400 C) | 0.75 |
| Nitrogen | Tasteless | Not flammable | Not available | Not available | Nonflammable | Nonflammable |

| | Lower Explosive Limits | Boiling Point | Freezing Point | Vapor Pressure | Vapor Density | Specific Gravity |
|----------|------------------------|-----------------|-----------------|-------------------|---------------|------------------|
| Hydrogen | 0.04 | -423 F (-253 C) | -434 F (-259 C) | 760 mmHg @ -253 C | 0.07 (Air=1) | Not applicable |
| Nitrogen | Nonflammable | -321 F (-196 C) | -346 F (-210 C) | 760 mmHg @ -196 C | 0.967 (Air=1) | Not applicable |

| | Water Solubility | pH | Odor Threshold | Evaporation Rate | Viscosity | Molecular Weight |
|----------|------------------|----------------|----------------|------------------|----------------------|------------------|
| Hydrogen | 1.82% @ 20 C | Not applicable | Not available | Not applicable | 0.008957 cP @ 26.8 C | 2 |
| Nitrogen | 1.6% @ 20 C | Not applicable | Not available | Not applicable | 0.01787 cP @ 27 C | 28.0134 |

| | Molecular Formula | Density | Weight per Gallon | Volatility by Volume | Volatility | Solvent Solubility |
|----------|-------------------|-------------------|-------------------|----------------------|----------------|--------------------------|
| Hydrogen | H2 | 0.08987 g/L @ 0 C | Not available | Not available | Not applicable | Soluble : Not available |
| Nitrogen | N2 | 1.2506 g/L | Not available | 100% | 1 | Soluble : Liquid ammonia |

Section 10: Stability and Reactivity

| | Stability | Conditions to Avoid | Incompatible Materials |
|----------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hydrogen | Stable at normal temperatures and pressure. | Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Containers may rupture or explode if exposed to heat. | Metals, oxidizing materials, metal oxides, combustible materials, halogens, metal salts, halo carbons, nitrogen trifluoride, oxygen difluoride, magnesium and calcium carbonate, sodium, potassium |
| Nitrogen | Stable at normal temperatures and pressure. | Protect from physical damage and heat. Containers may rupture or explode if exposed to heat. | Metals, oxidizing materials |

| | Hazardous Decomposition Products | Possibility of Hazardous Reactions |
|----------|--------------------------------------|------------------------------------|
| Hydrogen | Miscellaneous decomposition products | Will not polymerize. |
| Nitrogen | Oxides of nitrogen | Will not polymerize. |

Section 11: Toxicology Information

Acute Effects

| | Oral LD50 | Dermal LD50 | Inhalation |
|----------|---------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hydrogen | Not available | Not available | Nausea, vomiting, difficulty breathing, irregular heartbeat, headache, fatigue, dizziness, disorientation, mood swings, tingling sensation, loss of coordination, convulsions, unconsciousness, coma |
| Nitrogen | Not available | Not available | Nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, tingling sensation, loss of coordination, convulsions, coma |

| | Eye Irritation | Skin Irritation | Sensitization |
|----------|-----------------------------------------------------------------|-----------------------------------------------|----------------------|
| Hydrogen | Not irritating | Not irritating | Difficulty breathing |
| Nitrogen | Contact with rapidly expanding gas may cause burns or frostbite | No information on significant adverse effects | Difficulty breathing |

Chronic Effects

| | Carcinogenicity | Mutagenicity | Reproductive Effects | Developmental Effects |
|----------|-----------------|---------------|----------------------|-----------------------|
| Hydrogen | Not available | Not available | Not available | No data |
| Nitrogen | Not hazardous | Not available | Not available | No data |

Section 12: Ecological Information

Fate and Transport

| | Eco toxicity | Persistence / Degradability | Bioaccumulation / Accumulation | Mobility in Environment |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------------------------|-------------------------|
| Hydrogen | Fish toxicity: Not available Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available | Not available | Not available | Not available |
| Nitrogen | Fish toxicity: Not available Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available | Not available | Not available | Not available |

Section 13: Disposal Considerations

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

Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

DOT Information For This Mixture

| | |
|--------------------|-----------------------------------------------------------|
| Shipping Name | Compressed gas, flammable, n.o.s. (Hydrogen, Nitrogen) |
| UN Number | UN1965 |
| Hazard Class | 2.1 |
| Hazard Information | FLAMMABLE GAS |

Individual Component Information

| | Proper Shipping Name | ID Number | Hazard Class or Division | Packing Group | Labeling Requirements | Passenger Aircraft or Railcar Quantity Limitations | Cargo Aircraft Only Quantity Limitations | Additional Shipping Description |
|----------|----------------------|-----------|--------------------------|----------------|-----------------------|----------------------------------------------------|------------------------------------------|---------------------------------|
| Hydrogen | Hydrogen, compressed | UN1049 | 2.1 | Not applicable | 2.1 | Forbidden | 150 kg | None |
| Nitrogen | Nitrogen, compressed | UN1066 | 2.2 | Not applicable | 2.2 | 75 kg or L | 150 kg | N/A |

Canadian Transportation of Dangerous Goods

| | Shipping Name | UN Number | Class | Packing Group / Risk Group |
|----------|----------------------|-----------|-------|----------------------------|
| Hydrogen | Hydrogen, compressed | UN1049 | 2.1 | Not applicable |
| Nitrogen | Nitrogen, compressed | UN1066 | 2.2 | Not applicable |

Section 15: Regulatory Information

U.S. Regulations

| | CERCLA Sections | SARA 355.30 | SARA 355.40 |
|----------|-----------------|----------------|----------------|
| Hydrogen | Not regulated. | Not regulated. | Not regulated. |
| Nitrogen | Not regulated. | Not regulated. | Not regulated. |

SARA 370.21

| | Acute | Chronic | Fire | Reactive | Sudden Release |
|----------|-------|---------|------|----------|----------------|
| Hydrogen | Yes | No | Yes | No | Yes |
| Nitrogen | Yes | No | No | No | Yes |

SARA 372.65

| | |
|----------|----------------|
| Hydrogen | Not regulated. |
| Nitrogen | Not regulated. |

OSHA Process Safety

| | |
|----------|----------------|
| Hydrogen | Not regulated. |
| Nitrogen | Not regulated. |

State Regulations

| | CA Proposition 65 |
|----------|-------------------|
| Hydrogen | Not regulated. |
| Nitrogen | Not regulated. |

Canadian Regulations

| | WHMIS Classification |
|----------|----------------------|
| Hydrogen | A, B1. |
| Nitrogen | A |

National Inventory Status

| | US Inventory (TSCA) | TSCA 12b Export Notification | Canada Inventory (DSL/NDSL) |
|----------|----------------------|------------------------------|-----------------------------|
| Hydrogen | Listed on inventory. | Not listed. | Listed on inventory. |
| Nitrogen | Listed on inventory. | Not listed. | Listed on inventory. |

Section 16: Other Information

| | NFPA Rating |
|----------|-----------------------------------------|
| Hydrogen | HEALTH=0 FIRE=4 REACTIVITY=0 |
| Nitrogen | HEALTH=0 FIRE=0 REACTIVITY=0 SPECIAL=SA |

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard