



ACCORDING TO US CFR 1910.1200

1. SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

| | |
|--------------|---|
| Product Name | R-116 AND NITROUS OXIDE MIXTURE. |
| Trade Name | HEXAFLUOROETHANE AND NITROUS OXIDE MIXTURE. |
| CAS No. | Mixture. |
| EC No. | Mixture. |

1.2 Relevant identified uses of the substance or mixture and uses advised against

| | |
|----------------------|--------------|
| Identified Use(s) | Refrigerant. |
| Uses Advised Against | Not known. |

1.3 Details of the supplier of the safety data sheet

Manufacturer

| | |
|------------------------|--|
| Company Identification | Hudson Technologies Company |
| Address | PO Box 1541 One Blue Hill Plaza Pearl River, New York USA |
| Postal code | 10965 |
| Telephone | +1 (800) 953 2244 |
| Fax | +1 (845) 512 6070 |
| E-mail | information@hudsontech.com |

1.4 Emergency telephone number

| | |
|-----------------|-------------------|
| Company | +1 (800) 501 4376 |
| CHEMTREC (U.S.) | +1 (800) 424 9300 |
| INTERNATIONAL | +1 (703) 527 3887 |

2. SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

US CFR 1910.1200 Gases under pressure; Press. Gas; Liquefied gas.

2.2 Label elements

Product Name R-116 AND NITROUS OXIDE MIXTURE.

Hazard Pictogram(s)



GHS04

Signal Word(s) Warning

Hazard Statement(s) H280: Contains gas under pressure; may explode if heated.
 OSHA-H01: MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.
 CGA-HG01: MAY CAUSE FROSTBITE.

Precautionary Statement(s) P202: Do not handle until all safety precautions have been read and understood.
 P262: Do not get in eyes, on skin, or on clothing.
 P304, P340, P313: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention.
 P304, P340, P312: ** IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
 P302, P336, P315: IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.
 P410+P403: Protect from sunlight. Store in a well-ventilated place.

2.3 Other hazards

May cause asphyxiation when concentrations are sufficient to reduce oxygen below safe breathing levels.
 May cause frost-bite.

2.4 Additional Information

CGA-PG05: Use a back flow preventive device in the piping.

CGA-PG06: Close valve after each use and when empty.

CGA-PG02 : Protect from sunlight when ambient temperature exceeds 52 °C (125 °F).

CGA-PG27: Read and follow the Safety Data Sheet (SDS) before use.

This SDS is available in languages other than English.

3. SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

| HAZARDOUS INGREDIENT(S) | CAS No. | %W/W | Hazard Statement(s) | Hazard Pictogram(s) |
|-------------------------|------------|------|--|---------------------|
| Perfluoroethane (R-116) | 76-16-4 | 90 | Press. Gas; Liquefied gas; H280 | GHS04 |
| Dinitrogen oxide | 10024-97-2 | 10 | Ox. Gas 1; H270 Press. Gas; Liquefied gas; H280 | GHS03 GHS04 |

4. SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

| | |
|--------------|--|
| Inhalation | If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if necessary. If breathing has stopped, apply artificial respiration. Get medical attention. |
| Skin Contact | Flush skin with large amounts of water. Thaw frosted parts with lukewarm water. Do no rub affected area. If symptoms persist, obtain medical attention. |
| Eye Contact | Flush eyes with water for at least 15 minutes while holding eyelids open. If symptoms persist, obtain medical attention. |
| Ingestion | Unlikely route of exposure. |

4.2 Most important symptoms and effects, both acute and delayed

Inhalation: High concentrations: Dizziness, Nausea, Unconsciousness.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

5. SECTION 5: FIREFIGHTING MEASURES

Non-flammable.

5.1 Extinguishing media

Suitable Extinguishing media As appropriate for surrounding fire.

Unsuitable extinguishing media None.

5.2 Special hazards arising from the substance or mixture

Contains gas under pressure; may explode if heated. The product should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment.

Decomposes in a fire giving off toxic fumes: Carbon monoxide, Carbon dioxide, Nitrogen oxides, Carbonyl halides.

5.3 Advice for fire-fighters

Fire fighters should wear complete protective clothing including self-contained breathing apparatus. If it is safe to do so, containers should be removed from fire area because they are likely to rupture under fire conditions. Keep containers cool by spraying with water if exposed to fire.

6. SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate area. Ensure adequate ventilation. Wear appropriate personal protective equipment, avoid direct contact.

6.2 Environmental precautions

Do not release large quantities into the surface water or into drains.

6.3 Methods and material for containment and cleaning up

Stop leak if safe to do so. Allow small spillages to evaporate provided there is adequate ventilation.

6.4 Reference to other sections

See Also Section 8, 13.

7. SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Provide sufficient ventilation. Avoid breathing gas. Avoid contact



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with skin and eyes. Wear protective gloves/protective clothing/eye protection/face protection. Do not drag, roll, slide or drop cylinders. Use a suitable hand truck design for cylinder movement. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object into valve cap openings. Doing so may damage valve causing a leak to occur. Secure cylinders in an upright position at all times, close all valves when not in use. Keep closed even when empty. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

7.2 Conditions for safe storage, including any incompatibilities

Protect from sunlight. Store in a well-ventilated place.

Storage temperature

<125°F (<52°C)

Storage life

Stable under normal conditions.

Incompatible materials

Strong oxidizing agents, Alkaline metals.

8. SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational Exposure Limits

| SUBSTANCE. | CAS No. | LTEL (8 hr TWA ppm) | LTEL (8 hr TWA mg/m³) | STEL (ppm) | STEL (mg/m³) | Note |
|---------------|------------|---------------------|-----------------------|------------|--------------|-------|
| Nitrous oxide | 10024-97-2 | 25 | 46 | | | NIOSH |

Remark

Footnote

NIOSH

National Institute for Occupational Safety and Health

8.2 Exposure controls

Appropriate engineering controls Ensure adequate ventilation.

Personal protection equipment



Eye Protection

Wear suitable eye/face protection.



Skin protection

Wear suitable gloves.



Respiratory protection

Wear suitable respiratory protective equipment if exposure to high levels of material is likely.

Thermal hazards Not applicable.

Environmental Exposure Controls Do not release large quantities into the surface water or into drains.

9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

| | |
|--|--|
| Appearance | Gas. |
| | Color : Colorless. |
| Odor | Slight ethereal. |
| Odor threshold | Not established. |
| pH | Not available. |
| Melting point/freezing point | Not available. |
| Initial boiling point and boiling range | -144.4°F (-98 °C) |
| Flash Point | Not applicable. |
| Evaporation rate | Not applicable. |
| Flammability (solid, gas) | Non-flammable. |
| Upper/lower flammability or explosive limits | Not applicable. |
| Vapor pressure | 43221mmHg @ 21.1°C (70°F) |
| Vapor density | 3.9 |
| Density | 6.41 kg/m³ |
| Relative density | 1.587 @ -73.3°C (100°F) |
| Solubility(ies) | Solubility (Water): Partially soluble. Solubility (Other): Not available. |
| Partition coefficient: n-octanol/water | Not available. |



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Auto-ignition temperature Not applicable.
Decomposition Temperature (°C) Not available.
Viscosity Not applicable.
Explosive properties Not explosive.
Oxidizing properties Not oxidizing.
9.2 Other information

None.

10. SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity .
Stable under normal conditions.
10.2 Chemical Stability
Stable under normal conditions.
10.3 Possibility of hazardous reactions
No hazardous reactions known if used for its intended purpose.
10.4 Conditions to avoid
Keep away from heat and direct sunlight.
10.5 Incompatible materials
Strong oxidizing agents, Alkaline metals.
10.6 Hazardous decomposition product(s)
Halogens, halogen acids and possibly carbonyl halides.

11. SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects
Acute toxicity - Ingestion Low acute toxicity.
Acute toxicity - Skin Contact Low acute toxicity.
Acute toxicity - Inhalation Low acute toxicity.
Skin corrosion/irritation Non-irritant.
Serious eye damage/irritation Non-irritant.
Skin sensitization data Not classified.
Respiratory sensitization data Not classified.
Germ cell mutagenicity There is no evidence of mutagenic potential.
Carcinogenicity No evidence of carcinogenicity.



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| | |
|--------------------------|-------------------|
| Reproductive toxicity | Not classified. |
| Lactation | Not classified. |
| STOT - single exposure | None anticipated. |
| STOT - repeated exposure | None anticipated. |
| Aspiration hazard | Not classified. |
| 11.2 Other information | Not known. |

12. SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

| | |
|----------------------------------|--------------------------------|
| Toxicity - Aquatic invertebrates | Low toxicity to invertebrates. |
| Toxicity - Fish | Low toxicity to fish. |
| Toxicity - Algae | Low toxicity to algae. |
| Toxicity - Sediment | Not classified. |
| Compartment | |
| Toxicity - Terrestrial | Not classified. |
| Compartment | |

12.2. Persistence and Degradation

No adverse ecological effects are expected.

12.3. Bioaccumulative potential

No adverse ecological effects are expected.

12.4. Mobility in soil

Not applicable.

12.5 Other adverse effects

Not known.

13. SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Containers must not be punctured or destroyed by burning, even when empty. Refer to manufacturer/supplier for information on recovery/recycling.

13.2 Additional Information

Disposal should be in accordance with local, state or national legislation.

14. SECTION 14: TRANSPORT INFORMATION

14.1 UN number

UN No. 1956

14.2 UN proper shipping name

UN proper shipping name COMPRESSED GAS, N.O.S.

14.3 Transport hazard class(es)

ADR/RID Class 2.2
 IMDG Class 2.2
 IMDG EMS Not available

ICAO/IATA

Excepted Quantities E1
 Passenger and Cargo Aircraft Forbidden for transport by air.

Limited Quantities Packing

Instructions

Passenger and Cargo Aircraft Forbidden for transport by air.
 Limited Quantities Max net Qty

Special Provisions Not applicable

Emergency Response 2L

Guidebook (ERG) Code

ADR Classification Code 1A

ADR HIN 20

ADR Transport Category 3

Tunnel Restriction Code E

Emergency Action Code 2TE

Advice on Additional Personal Protection (APP) Not applicable

14.4 Packing group

Packing group Not applicable

Labels 2.2



Special Provisions 274 655

Limited Quantities 120 m

Excepted Quantities E1



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Mixed Packing Instructions for Packages P200

Special Packing Provisions for Packages Not applicable

Mixed Packing Instructions for Packages MP9

14.5 Environmental hazards

Environmental hazards Not classified as a Marine Pollutant.

14.6 Special precautions for user

Special precautions for user Not known.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Packing Instructions for Portable (M)

Tanks

Special Provisions for Portable Tanks Not applicable

Tanks

Tank Code for Tanks CxBN(M)

Special Provisions for Tanks TA4 TT9

Vehicle for Tank Carriage AT

Special Provisions for Carriage - Not applicable

Packages

Special Provisions for Carriage - Not applicable

Bulk

Special Provisions for Carriage - CV9 CV10 CV36

Loading, Unloading and Handling

Special Provisions for Carriage - Not applicable

Operation

15. SECTION 15: REGULATORY INFORMATION

15.1 Federal

Toxic and hazardous substances All chemicals are not listed.

(29 CFR 1910; Subpart Z)

National emission standards for All chemicals are not listed.

hazardous air pollutants (40 CFR

61.01)



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Title III Consolidated List of Lists All chemicals are not listed.

TSCA (Toxic Substance Control Act) All chemicals listed.

CAA 602 - Ozone Depleting Substances (ODS) All chemicals are not listed.

15.2 State

State Right to Know Lists Perfluoroethane (CAS No.: 76-16-4)
Listed in: New Jersey.

Dinitrogen oxide (CAS No.: 10024-97-2)
Listed in: New Jersey, Pennsylvania, Minnesota.

Proposition 65 (California) Dinitrogen oxide (CAS No.: 10024-97-2)

15.3 Other

OSPAR List of Chemicals for Priority Action All chemicals are not listed.

NTP (National Toxicology Program) All chemicals are not listed.

OSHA All chemicals are not listed.

(List of Highly Hazardous Chemicals, Toxics and Reactives)

IARC (International Agency for Research on Cancer) All chemicals are not listed.

16. SECTION 16: OTHER INFORMATION

The following sections contain 1-16 revisions or new statements:

| | |
|------|------|
| NFPA | HMIS |
|------|------|

| | | | |
|-------------|---|------------------|---|
| Health | 1 | Health | 1 |
| Fire | 0 | Flammability | 0 |
| Instability | 1 | Physical hazards | 0 |

LEGEND:

Hazard Pictogram(s)



GHS04

Hazard Statement(s)

H280: Contains gas under pressure; may explode if heated.

Precautionary Statement(s)

P410+P403: Protect from sunlight. Store in a well-ventilated place.

Additional Information required by Federal Standard 313 Rev. E:

Contract or Solicitation Number: SPE4A6-16-D-0226

Prime Contractor: Hudson Technologies, Inc.

Prime Contractor CAGE: 7DSQ0

National Stock Number (NSN): 6830012962459

Specification Reference:

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