< 2.3% NITRIC OXIDE In ARGON
Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product Name</th>
<th>&lt; 2.3% NITRIC OXIDE In ARGON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Code(s)</td>
<td>186 Linde</td>
</tr>
<tr>
<td>UN-Number</td>
<td>UN1956</td>
</tr>
<tr>
<td>Recommended Use</td>
<td>Welding.</td>
</tr>
<tr>
<td>Trade Name</td>
<td>MISON® ARGON® MISON® MASTER</td>
</tr>
<tr>
<td>Chemical Emergency Phone Number</td>
<td>Chemtrec: 1-800-424-9300 for US/ 703-527-3887 outside US</td>
</tr>
</tbody>
</table>

2. HAZARDS IDENTIFICATION

WARNING!

Emergency Overview

Harmful by inhalation
Severely irritating to eyes, skin, and respiratory system.
Toxic effects may be delayed and severe.
Contents under pressure
Keep at temperatures below 52°C / 125°F

Appearance Reddish-brown in air
Physical State Compressed gas.
Odor Acrid

OSHA Regulatory Status
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Potential Health Effects

Principle Routes of Exposure

Eye contact. Skin contact. Inhalation.

Acute Toxicity

Inhalation

Harmful by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Symptoms may be delayed by up to 72 hours.

Eyes

Severely irritating to eyes.

Skin

Contact causes severe skin irritation and possible burns.

Skin Absorption Hazard

No known hazard by skin absorption.

Ingestion

Not an expected route of exposure. Ingestion causes burns of the upper digestive and respiratory tract.

Chronic Effects

Prolonged or repeated overexposures to this gas mixture may cause bronchitis, hacking cough, nasal irritation and discharge, increased fatigue, and alteration in the senses of taste and smell. Repeated exposure to the skin may cause dermatitis. Prolonged exposure to this gas mixture may cause potentially harmful amounts of Nitric Oxide to enter the body via absorption through the skin. Repeated overexposures to this gas mixture can also result in dental erosion and gum disorders.

Aggravated Medical Conditions

Skin disorders. Pre-existing eye disorders. Respiratory disorders.

Environmental Hazard

See Section 12 for additional Ecological Information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Volume %</th>
<th>Chemical Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argon</td>
<td>7440-37-1</td>
<td>0-99</td>
<td>Ar</td>
</tr>
<tr>
<td>Nitric oxide</td>
<td>10102-43-9</td>
<td>&lt; 2.3</td>
<td>NO</td>
</tr>
</tbody>
</table>

Additional information: Composition listed covers broad ranges rather than exact percentages for specific products.

4. FIRST AID MEASURES

Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

Skin Contact

Wash off immediately with soap and plenty of water for at least 15 minutes while removing all contaminated clothing and shoes. Call a physician immediately.

Inhalation

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF INHALATION OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious inhalation victims should be assisted to an uncontaminated area and inhale fresh air. If breathing is difficult, administer oxygen. Unconscious persons should be moved to an uncontaminated area and, as necessary, given artificial resuscitation and supplemental oxygen. Treatment should be symptomatic and supportive. Any physical exertion during this period should be discouraged as it may increase the severity of the pulmonary edema or chemical pneumonitis. Bed rest is indicated.

Ingestion

None under normal use. Call a physician or Poison Control Center immediately.

Notes to Physician

Treat symptomatically.
5. FIRE-FIGHTING MEASURES

Flammable Properties
- Not flammable.

Suitable Extinguishing Media
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Hazardous Combustion Products
- Nitric acid and nitrous acid.

Explosion Data
- Sensitivity to Mechanical Impact: None
- Sensitivity to Static Discharge: None
- Specific Hazards Arising from the Chemical: Nitric oxide hydrolizes to nitric acid in the presence of moisture. Continue to cool fire exposed cylinders until flames are extinguished. Cylinders may rupture under extreme heat. Damaged cylinders should be handled only by specialists.

Protective Equipment and Precautions for Firefighters
- As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Additional chemical protective clothing may be required to protect from toxic decomposition products.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
- Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Monitor for nitric oxide prior to re-entry.

Environmental Precautions
- Prevent spreading of vapors through sewers, ventilation systems and confined areas.

Methods for Containment
- Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. If leak is in container or container valve, contact the appropriate emergency telephone number in Section 1 or call your closest Linde location.

Methods for Cleaning Up
- Return cylinder to Linde or an authorized distributor.

Other Information
- Ventilate the area.

7. HANDLING AND STORAGE

Handling
- Nitric oxide is non-corrosive and may be used with most common structural materials. However, in the presence of moisture and oxygen, corrosive conditions will develop as a result of the formation of nitric and nitrous acids. Prior to use, systems to contain nitric oxide must first be purged with an inert gas. Where air contamination cannot be eliminated stainless steel should be used.

- Cylinder valves should be regularly inspected for corrosion (apparent by discoloration or rust). Inspection should include neck (where valve inserts into cylinder) and bonnet nut (where handle attaches to valve body).

- Use only in ventilated areas. Never attempt to lift a cylinder by its valve protection cap. Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distance, use a cart designed to transport cylinders. Use equipment rated for cylinder pressure. Use backflow preventive device in piping. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing leak to occur.
Use an adjustable strap wrench to remove over-tight or rusted caps. Close valve after each use and when empty. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.

Never put cylinders into trunks of cars or unventilated areas of passenger vehicles. Never attempt to refill a compressed gas cylinder without the owner’s written consent. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.

For additional recommendations consult Compressed Gas Association’s Pamphlets P-1 and Safety Bulletin SB-2.

Storage

Protect from physical damage. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling. Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Keep at temperatures below 52°C / 125°F. Full and empty cylinders should be segregated. Use a “first in-first out” inventory system to prevent full cylinders from being stored for excessive periods of time. Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, pamphlet CGA-P1, Safe Handling of Compressed Gases in Containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric oxide 10102-43-9</td>
<td>TWA: 25 ppm</td>
<td>TWA: 25 ppm TWA: 30 mg/m³</td>
<td>IDLH: 100 ppm TWA: 30 mg/m³ TWA: 25 ppm</td>
</tr>
</tbody>
</table>

Immediately Dangerous to Life or Health.

Other Exposure Guidelines

Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

Engineering Measures

Showers. Eyewash stations. Ventilation systems. Exhaust gas should be vented to a gas treatment system.

Ventilation

Use ventilation adequate to keep exposures below recommended exposure limits.

Personal Protective Equipment

Eye/Face Protection

Tightly fitting safety goggles.

Skin and Body Protection

Work gloves and safety shoes are recommended when handling cylinders.

Respiratory Protection

General Use

If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

Emergency Use

Use positive pressure air line respirator or self-contained breathing apparatus for exposure over exposure limits or emergency use. For exposures above IDLH, an additional escape bottle is required.

Hygiene Measures

Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use. Provide regular cleaning of equipment, work area and clothing. Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.
9. PHYSICAL AND CHEMICAL PROPERTIES

Product Information

<table>
<thead>
<tr>
<th>Property</th>
<th>Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Reddish-brown in air.</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>0.29 - 0.97 ppm (Nitric oxide)</td>
</tr>
<tr>
<td>Flash Point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammability Limits in Air</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Physical State</td>
<td>Compressed gas</td>
</tr>
<tr>
<td>Odor</td>
<td>Acrid.</td>
</tr>
</tbody>
</table>

The following information is for the NON-INERT components of this mixture:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Boiling Point</th>
<th>Melting Point</th>
<th>Molecular Weight</th>
<th>Evaporation Rate</th>
<th>Water Solubility</th>
<th>Vapor Pressure</th>
<th>Vapor Density (Air=1)</th>
<th>Gas Density Kg/m³@20°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric oxide</td>
<td>-151.8 °C</td>
<td>-164 °C</td>
<td>31.01</td>
<td>-</td>
<td>No information available</td>
<td>26000 mmHg @ 20 °C</td>
<td>1.04</td>
<td>1.248</td>
</tr>
</tbody>
</table>

The following information is for the INERT components that may be part of this mixture:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Boiling Point</th>
<th>Melting Point</th>
<th>Molecular Weight</th>
<th>Evaporation Rate</th>
<th>Water Solubility</th>
<th>Vapor Pressure</th>
<th>Vapor Density (Air=1)</th>
<th>Gas Density Kg/m³@20°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argon</td>
<td>-185.9 °C</td>
<td>-189.4 °C</td>
<td>39.94</td>
<td>-</td>
<td>0.056 (vol/vol @ 0°C and 1 atm)</td>
<td>Above critical temperature</td>
<td>1.38</td>
<td>1.65</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Stability

Stable under recommended storage conditions.

Incompatible Products


Conditions to Avoid

Heat, flames and sparks. Reacts vigorously with fluorine, fluorine oxides, and chlorine in the presence of moisture.

Hazardous Decomposition Products

Oxidizes in air to form nitrogen dioxide, which is extremely reactive and a strong oxidizer. Upon contact with moisture and oxygen, produces nitrous and nitric acid.

Hazardous Polymerization

Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product Information

LD50 Oral: No information available.

LD50 Dermal: No information available.

LC50 Inhalation: No information available.
Inhalation: Mice which inhaled a total of 320 ppm nitric oxide exhibited convulsions or effects on seizure threshold as well as cyanosis.

Repeated Dose Toxicity: No information available.

Component Information:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric oxide</td>
<td></td>
<td></td>
<td>115 ppm/1 hr (Rat) NO2</td>
</tr>
</tbody>
</table>

Chronic Toxicity: Prolonged or repeated overexposures to this gas mixture may cause bronchitis, hacking cough, nasal irritation and discharge, increased fatigue, and alteration in the senses of taste and smell. Repeated exposure to the skin may cause dermatitis. Prolonged exposure to this gas mixture may cause potentially harmful amounts of Nitric Oxide to enter the body via absorption through the skin. Repeated overexposures to this gas mixture can also result in dental erosion and gum disorders.

Carcinogenicity: Contains no ingredient listed as a carcinogen.

Irritation: No information available.

Sensitization: No information available.

Reproductive Toxicity: No information available.

Developmental Toxicity: Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

Synergistic Materials: None known.


12. ECOLOGICAL INFORMATION

Ecotoxicity:
The environmental impact of this product has not been fully investigated.

Ozone depletion potential, ODP; (R-11 = 1): Does not contain ozone depleting chemical (40 CFR Part 82).

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Do not attempt to dispose of residual 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 Linde for proper disposal.

Contaminated Packaging: Do not re-use empty containers.
14. TRANSPORT INFORMATION

**DOT**

- **Proper shipping name**: Compressed gas, n.o.s.
- **Hazard Class**: 2.2
- **Subsidiary Class**: None
- **UN-Number**: UN1956
- **Description**: UN1956, Compressed gas, n.o.s. (Argon, Nitric oxide), 2.2
- **Emergency Response Guide Number**: 126

**TDG**

- **Proper Shipping Name**: Compressed gas, n.o.s.
- **Hazard Class**: 2.2
- **UN-Number**: UN1956
- **Description**: UN1956, COMPRESSED GAS, N.O.S., 2.2

**MEX**

- **Proper Shipping Name**: Compressed gas, n.o.s.
- **Hazard Class**: 2.2
- **UN-Number**: UN1956
- **Description**: UN1956 Compressed gas, n.o.s. (Argon, Nitric oxide), 2.2

**IATA**

- **UN-Number**: UN1956
- **Proper Shipping Name**: Compressed gas, n.o.s.
- **Hazard Class**: 2.2
- **ERG Code**: 2L
- **Description**: UN1956, Compressed gas, n.o.s. (Argon, Nitric oxide), 2.2
- **Maximum Quantity for Passenger**: 75 kg
- **Maximum Quantity for Cargo Only**: 150 kg
- **Limited Quantity**: No information available.

**IMDG/IMO**

- **Proper Shipping Name**: Compressed gas, n.o.s.
- **Hazard Class**: 2.2
- **UN-Number**: UN1956
- **EmS No.**: F-C, S-V
- **Description**: UN1956, Compressed gas, n.o.s. (Argon, Nitric oxide), 2.2

**ADR**

- **Proper Shipping Name**: Compressed gas, n.o.s.
- **Hazard Class**: 2.2
- **UN-Number**: UN1956
- **Classification Code**: 1A
- **Description**: UN1956 Compressed gas, n.o.s. (Argon, Nitric oxide), 2.2
15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>U.S. - CAA (Clean Air Act) - Accidental Release Prevention - Toxic Substances</th>
<th>U.S. - CAA (Clean Air Act) - Accidental Release Prevention - Flammable Substances</th>
<th>U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric oxide</td>
<td>10000 lbs</td>
<td></td>
<td>250 lb</td>
</tr>
</tbody>
</table>

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product does not contain any substances regulated as hazardous air pollutants (HAPs) under Section 112 of the Clean Air Act Amendments of 1990.

CERCLA/SARA
This material, as supplied, contains one or more substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Hazardous Substances RQs</th>
<th>Extremely Hazardous Substances RQs</th>
<th>TPQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric oxide</td>
<td>10 lb</td>
<td>10 lb</td>
<td>100 lb TPQ</td>
</tr>
</tbody>
</table>

U.S. State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.
U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argon</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitric oxide</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
</tr>
</tbody>
</table>

International Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Carcinogen Status</th>
<th>Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric oxide</td>
<td></td>
<td>Mexico: TWA= 25 ppm, TWA= 30 mg/m³, STEL= 35 ppm, STEL= 45 mg/m³</td>
</tr>
</tbody>
</table>

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class
A Compressed gases
D2B Toxic materials

16. OTHER INFORMATION

Prepared By          Product Stewardship
                     23 British American Blvd.
                     Latham, NY 12110
                     1-800-572-6501

Issuing Date         10-Feb-2011

Revision Date        

Revision Number      0

Revision Note        Initial Release.

NFPA                 Health Hazard 3 Flammability 0 Stability 1

HMIS                 Health Hazard 2 Flammability 0 Physical Hazard 3 Personal Protection

Note: Ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2009, CGA Recommended Hazard Ratings for Compressed Gases, 3rd Edition.
General Disclaimer
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End of Safety Data Sheet