1. PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Helium-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Formula</td>
<td>^3He</td>
</tr>
<tr>
<td>CAS No.</td>
<td>14762-55-1</td>
</tr>
<tr>
<td>UN No.</td>
<td>1046</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Helium; Isotopic Helium; ^3He; He-3</td>
</tr>
<tr>
<td>Recommended Use</td>
<td>Compressed gas</td>
</tr>
</tbody>
</table>
| Supplier Address* | ISOFLEX USA  
| | PO Box 29475  
| | San Francisco CA 94129  
| | United States |
| Telephone | +1 415-440-4433 |
| Fax | +1 415-563-4433 |
| Emergency Phone Number | Infotrac/ +1 800-535-5053 |
| (both supplier and manufacturer) | *May include subsidiaries or affiliate companies/divisions |
| Email | iusa@isoflex.com |
| Website | www.isoflex.com |
| Preparation Information | ISOFLEX USA  
| | Product Safety  
| | +1 415-440-4433 |

2. HAZARDS IDENTIFICATION

Emergency Overview

Simple asphyxiant.  
Contents under pressure.  
Intentional misuse of this product can cause serious lung damage or death.  
Keep at temperatures below 52 °C / 125 °F.  
Appearance: Colorless.  
Physical State: Compressed gas.  
Odor: Odorless.

OSHA Regulatory Status

This material is considered hazardous by the OSHA.  

NFPA Ratings: (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health Hazard = 0  
Flammability = 0  
Reactivity = 0  
Special Notice = Simple Asphyxiant
HMIS Ratings: (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health Hazard = 0      Flammability = 0      Physical Hazard = 3

<table>
<thead>
<tr>
<th></th>
<th>HEALTH HAZARD</th>
<th>FLAMMABILITY</th>
<th>PHYSICAL HAZARD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HEALTH HAZARD</strong></td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>FLAMMABILITY</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>PHYSICAL HAZARD</strong></td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Potential Health Effects

Inhalation
Principal route of exposure is inhalation. Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

Eyes
None known

Skin
None known

Skin Absorption Hazard
No known hazard in contact with skin

Ingestion
None known

Chronic Effects
None known

Aggravated Medical Conditions
None known

Environmental Hazard
See Section 12 for additional ecological information.

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.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name: He-3 Helium
CAS No. 14762-55-1
Volume % >99
Chemical Formula $^3$He

4. FIRST AID MEASURES

Eye Contact
None under normal use. Get medical attention if symptoms occur.

Skin Contact
None under normal use. Get medical attention if symptoms occur.

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.

Ingestion
None under normal use. Get medical attention if symptoms occur. Treat symptomatically.
5. **FIREFIGHTING MEASURES**

   **Flammable Properties**
   - Not flammable

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

   **Explosion Data**
   - **Sensitivity to Mechanical Impact**: None
   - **Sensitivity to Static Discharge**: None
   - **Specific Hazards Arising from the Chemical**: Cylinders may rupture under extreme heat. Continue to cool fire-exposed cylinders until flames are extinguished. 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.

6. **ACCIDENTAL RELEASE MEASURES**

   **Personal Precautions**
   - Ensure adequate ventilation. Evacuate personnel to safe areas. Use personal protective equipment. Monitor oxygen level.

   **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.

   **Methods for Cleaning Up**
   - Return cylinder to ISOFLEX USA.

7. **HANDLING AND STORAGE**

   **Handling**
   - 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. Keep out of the reach of children.

   - Handle in accordance with good industrial hygiene and safety practice.

   **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.

   - 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
This product does not contain any hazardous materials with occupational exposure limits established by the region-specific regulatory bodies.

Engineering Measures
Local exhaust ventilation to prevent accumulation of high concentrations and maintain air-oxygen levels at or above 19.5%

Ventilation
Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/Face Protection
Wear protective eyewear (safety glasses).

Skin and Body Protection
Work gloves and safety shoes are recommended when handling cylinders.

Respiratory Protection
No special protective equipment required.

General Use

Emergency Use
Use positive pressure airline respirator with escape cylinder or self-contained breathing apparatus for oxygen-deficient atmospheres (<19.5%).

Hygiene Measures
Wear suitable gloves and eye/face protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Colorless

Odor Threshold
No information available

Flash Point
No information available

Decomposition Temperature
No information available

Freezing Point
No information available

Water Solubility
8.61 m³/1 kg water @ 20 °C and 1 atm

Vapor Pressure
No information available.

Gas Density
@ 21.1 °C (70°F) ("NTP"): 0.0078 lb/ft³ (0.125 kg/m³) (0.125 g/ltr) @ 0 °C ("STP"): 0.0084 lb/ft³ (0.135 kg/m³) (0.135 g/ltr)

Flammability Limits in Air
Upper
Not applicable

Lower
Not applicable

10. STABILITY AND REACTIVITY

Stability
Stable

Incompatible Products
None known

Conditions to Avoid
None known

Hazardous Decomposition Products
None known, based on information supplied

Hazardous Polymerization
Hazardous polymerization does not occur
11. **TOXICOLOGICAL INFORMATION**

**Acute Toxicity**
- **LD50 Oral** No information available
- **LD50 Dermal** No information available
- **LC50 Inhalation** No information available
- **Repeated Dose Toxicity** No information available

**Chronic Toxicity**
- **Chronic Toxicity** None known
- **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

**Target Organ Effects** 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 ISOFLEX USA for proper disposal.

14. **TRANSPORT INFORMATION**

**DOT**
- **Proper shipping name** Helium, compressed
- **Hazard Class** 2.2
- **Subsidiary Class** None
- **UN No.** UN1046
- **Description** UN1046, Helium, compressed, 2.2
- **Emergency Response** 121
- **Guide Number**

**TDG**
- **Proper Shipping Name** Helium, compressed
- **Hazard Class** 2.2
- **UN No.** UN1046
- **Description** UN1046, Helium, compressed, 2.2
<table>
<thead>
<tr>
<th><strong>MEX</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Shipping Name</td>
<td>Helium, compressed</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>2.2</td>
</tr>
<tr>
<td>UN No.</td>
<td>UN1046</td>
</tr>
<tr>
<td>Description</td>
<td>UN1046, Helium, compressed, 2.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>IATA</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Shipping Name</td>
<td>Helium, compressed</td>
</tr>
<tr>
<td>UN No.</td>
<td>UN1046</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>2.2</td>
</tr>
<tr>
<td>ERG Code</td>
<td>2L</td>
</tr>
<tr>
<td>Description</td>
<td>UN1046, Helium, compressed, 2.2</td>
</tr>
<tr>
<td>Maximum Quantity for Passenger</td>
<td>No information available</td>
</tr>
<tr>
<td>Maximum Quantity for Cargo Only</td>
<td>No information available</td>
</tr>
<tr>
<td>Limited Quantity</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>IMDG/IMO</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Shipping Name</td>
<td>Helium, compressed</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>2.2</td>
</tr>
<tr>
<td>UN No.</td>
<td>UN1046</td>
</tr>
<tr>
<td>EmS No.</td>
<td>F-C, S-V</td>
</tr>
<tr>
<td>Description</td>
<td>UN1046, Helium, compressed, 2.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>ADR</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Shipping Name</td>
<td>Helium, compressed</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>2.2</td>
</tr>
<tr>
<td>UN No.</td>
<td>UN1046</td>
</tr>
<tr>
<td>Classification Code</td>
<td>1A</td>
</tr>
<tr>
<td>Description</td>
<td>UN1046, Helium, compressed, 2.2</td>
</tr>
</tbody>
</table>

15. REGULATORY INFORMATION

**International Inventories**
- TSCA: Complies
- DSL: Complies
- EINECS / ELINCS: Complies

**Legend**
- TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
- DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
- EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

**U.S. Federal Regulations**
- **SARA 313**: Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.
SARA 311/312 Hazard Categories

Acute Health Hazard  No
Chronic Health Hazard  No
Fire Hazard  No
Sudden Release of Pressure Hazard  Yes
Reactive Hazard  No

Clean Water Act  This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

Risk and Process Safety  This material, as supplied, does not contain any regulated substances Management Programs with specified thresholds under 40 CFR Part 68. This product does not contain any substances regulated as Highly Hazardous Chemicals pursuant to the 29 CFR Part 1910.110.

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, does not contain any 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). There may be specific reporting requirements at the local, regional or state level pertaining to releases of this material.

U.S. State Regulations

California Proposition 65  This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Massachusetts  X
New Jersey  X
Pennsylvania  X
Illinois  -
Rhode Island  X

International Regulations

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

WHMIS Hazard Class:  A compressed gas

16. OTHER INFORMATION

Prepared By  ISOFLEX USA
PO Box 29475
San Francisco CA 94129
United States

Issuing Date  August 28, 2011
Revision Date  August 1, 2021
Revision Number  4
Revision Note  Required review and update
ISOFLEX USA’s Commonly Used Abbreviations and Acronyms*

ACGIH  American Conference of Governmental Industrial Hygienists
ADR  European Agreement Concerning the International Carriage of Dangerous Goods by Road
ALARA  As Low As Is Reasonably Achievable
AMU  Atomic Mass Unit
ANSI  American National Standards Institute
BLS  Basic Life Support
CAM  Continuous Air Monitor
CAS  Chemical Abstracts Service (division of the American Chemical Society)
CEN  European Committee for Standardization
CERCLA  Comprehensive Environmental Response Compensation and Liability Act
CLP  Classification, Labelling and Packaging (European Union)
CPR  Controlled Products Regulations (Canada)
CWA  Clean Water Act (USA)
DAC  Derived Air Concentration (USA)
DOE  United States Department of Energy (USA)
DOT  United States Department of Transportation (USA)
DSL  Domestic Substances List (Canada)
EC50  Half Maximal Effective Concentration
EINECS  European Inventory of Existing Commercial Chemical Substances
EHS  Environmentally Hazardous Substance
ELINCS  European List of Notified Chemical Substances
EMS  Emergency Response Procedures for Ships Carrying Dangerous Goods
EPA  Environmental Protection Agency (USA)
EPCRA  Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986
GHS  Globally Harmonized System
HMIS  Hazardous Materials Identification System (USA)
IARC  International Agency for Research on Cancer
IATA  International Air Transport Association
IBC  Intermediate Bulk Containers
ICAO  International Civil Aviation Organization
IDLH  Immediately Dangerous to Life or Health
IMDG  International Maritime Code for Dangerous Goods
LC50  Lethal concentration, 50 percent
LD50  Lethal dose, 50 percent
LDLO  Lethal Dose Low
LOEC  Lowest-Observed-Effective Concentration
MARPOL  International Convention for the Prevention of Pollution from Ships
MSHA  Mine Safety and Health Administration (USA)
NCRP  National Council on Radiation Protection & Measurements (USA)
NDSL  Non-Domestic Substances List (Canada)
NFPA  National Fire Protection Association (USA)
NIOSH  National Institute for Occupational Safety and Health (USA)
NOEC  No Observed Effect Concentration
N.O.S.  Not Otherwise Specified
NRC  Nuclear Regulatory Commission (USA)
NTP  National Toxicology Program (USA)
OSHA  Occupational Safety and Health Administration (USA)
PBT  Persistent Bioaccumulative and Toxic Chemical
PEL  Permissible Exposure Limit
PIH  Poisonous by Inhalation Hazard
RCRA  Resource Conservation and Recovery Act (USA)
RCT  Radiation Control Technician
REACH  Registration, Evaluation, Authorisation and Restriction of Chemicals (Europe)
RID  Regulations Concerning the International Transport of Dangerous Goods by Rail
RTECS  Registry of Toxic Effects of Chemical Substances
SARA  Superfund Amendments and Reauthorization Act (USA)
TDG  Transportation of Dangerous Goods (Canada)
TIH  Toxic by Inhalation Hazard
TLV  Threshold Limit Value
TPQ  Threshold Planning Quantity
TSCA  Toxic Substances Control Act
TWA  Time Weighted Average
UN  United Nations (Number)
VOC  Volatile Organic Compound
vPvB  Very Persistent Very Bioaccumulative Chemical
WGK  Wassergefährdungsklassen (Germany: Water Hazard Classes)
WHMIS  Workplace Hazardous Materials Information System

*One or more of the above-listed items may not appear in this document.

General Disclaimer

For terms and conditions, including limitation of liability, please refer to the purchase agreement in effect between ISOFLEX USA (or any of its affiliates and subsidiaries) and the purchaser.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. ISOFLEX shall not be held liable for any damage resulting from handling or from contact with the above product.