1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	**Krypton, Enriched Krypton**
Chemical Formula	Kr
Chemical Family	Rare inert gas
Molecular Weight:	83.80
CAS No.	7439-90-9
EINECS No.	231-098-5
Supplier Address*	ISOFLEX USA PO Box 472615 San Francisco CA 94147 United States
Telephone	+1 415-440-4433
Fax	+1 415-563-4433
Emergency Phone Number (both supplier and manufacturer)	Infotrac/ +1 800-535-5053 *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. HAZARDOUS IDENTIFICATION

Emergency Overview:

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 = 0**

HEALTH HAZARD	0

FLAMMABILITY	0
PHYSICAL HAZARD	0
PERSONAL PROTECTION	

Time Weighted Average	No TWA is listed for krypton by ACGIH 1992-1993 or OSHA 1991.
Exposure Limit	Should be considered a simple asphyxiant. Oxygen levels should be maintained at greater than 18 Molar percent at normal atmospheric pressure (pOx>135 torr).
Physical Description	Colorless, odorless, tasteless gas which condenses to a colorless liquid.
Physical Hazards	Containers may rupture or explode if exposed to heat.

Potential Health Effects:

Inhalation	Effects of exposure to high concentrations so as to displace the oxygen in the air necessary for life are headache, dizziness, labored breathing and eventual unconsciousness.
Skin Contact	Short-Term Exposure: Frostbite. Long-Term Exposure: No information is available.
Eye Contact	Short-Term Exposure: Frostbite. Long-Term Exposure: No information is available.
Ingestion	Short-Term Exposure: No information on significant adverse effects; Long-Term Exposure: No information is available.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name:	Krypton
CAS No.:	7439-90-9
Chemical Formula:	Kr
Molecular Weight:	83.80

4. FIRST AID MEASURES

Recommended First Aid Treatment	Prompt medical attention is mandatory in all cases of overexposure to krypton. Rescue personnel should be equipped with self-contained breathing apparatus.
Inhalation Exposure	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 respiration and supplemental oxygen. Further treatment should be symptomatic and supportive.
Dermal Exposure	If frostbite or freezing occurs, flush immediately with plenty of lukewarm water (105-115 ºF; 41-46 ºC). *Do not use hot water*. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.
Eye Exposure	Flush eyes with plenty of water.
Ingestion Exposure	If a large amount is swallowed, get medical attention.

5. FIREFIGHTING MEASURES

Fire and Explosion Hazards	Negligible fire hazard.
Suitable Extinguishing Media	Carbon dioxide, regular dry chemical. Large fires: Use regular foam or flood with fine water spray.
Firefighting	Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, evacuation radius: 800 meters (½ mile). Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Do not get water directly on material. Reduce vapors with water spray. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Consider downwind evacuation if material is leaking.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

Stop leak if possible without personal risk. Evacuate all personnel from affected area, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Use appropriate protective equipment.

Environmental Precautions

Methods for Cleaning Up

If leak is in container or container valve, contact your closest supplier location or call the emergency telephone number listed herein.

7. HANDLING AND STORAGE

Handling

Use only in well-ventilated areas. Valve protection caps must remain in place unless cylinder is secured with valve outlet piped to use point. Do not drag, slide 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 cylinder. Use a check valve or trap in the discharge line to prevent hazardous backflow into the cylinder.

Storage

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area, away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125 °F (52 °C). Cylinders should 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 from being stored for excessive periods of time.

Packaging Recommendations	Noncorrosive; may be used with any common structural material.
Other Recommendations or Precautions	Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Always secure cylinders in an upright position before transporting them.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits	No occupational exposure limits established.
Ventilation	Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.
Eye Protection	*Gas:* Eye protection not required, but recommended.

	Liquid: Wear splash-resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye-wash fountain and quick-drench shower in the immediate work area.
Clothing	*Gas*: Protective clothing is not required. *Liquid*: Wear appropriate protective, cold-insulating clothing.
Gloves	Wear insulated gloves.
Respirator	Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. For *Unknown Concentrations* or *Immediately Dangerous to Life or Health* - Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	Gas
Color	Colorless gas which condenses to a colorless liquid
Odor	Odorless
Taste	Tasteless

Safety Data

Molecular Weight:	83.80
Molecular Formula:	Kr
Vapor Pressure at STP:	Not available
Vapor Density (Air = 1):	2.92
Evaporation Point:	Not available
Boiling Point:	-244 °F; -153.3 °C
Freezing Point:	-250.9 °F; -157.2 °C
pH:	Not applicable
Specific Gravity:	Not available
Oil/Water Partition Coefficient:	Not available
Solubility (H_2O):	Negligible
Odor Threshold:	Not applicable

10. STABILITY AND REACTIVITY

Reactivity	Stable at normal temperatures and pressure
Conditions to Avoid	Protect from physical damage and heat. Containers may rupture or explode if exposed to heat.
Incompatible Materials	No data available
Polymerization	Will not polymerize

11. TOXICOLOGICAL INFORMATION

Persons in ill health, where such illness would be aggravated by exposure to krypton, should not be allowed to work with or handle these products.

Toxicological Properties — Krypton is nontoxic, but the liberation of a large amount in a confined area could displace the amount of oxygen in air necessary to support life.

Carcinogenicity

IARC	Not listed as a carcinogen or potential carcinogen.
NTP	Not listed as a carcinogen or potential carcinogen.
OSHA	Not listed as a carcinogen or potential carcinogen.

Additional Data — Naturally-occurring isotopes of krypton are non-radioactive; some synthetic isotopes are radioactive.

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12. ECOLOGICAL INFORMATION

Toxicity / Ecology – General	No ecological damage caused by this product
Persistence and Degradability	No ecological damage caused by this product
Bioaccumulative Potential	No ecological damage caused by this product
Mobility in Soil	No ecological damage caused by this product
Other Adverse Effects	Effects on ozone layer / global warming: None

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13. DISPOSAL CONSIDERATIONS

Product — 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 your supplier. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number listed herein.

Contaminated Packaging — Dispose of container in accordance with local/regional/national/ International regulations. Contact supplier for any special requirements.

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14. TRANSPORT INFORMATION

DOT

Proper Shipping Name	Krypton, compressed
Hazard Cass	2.2 (Non-flammable, non-corrosive and non-poisonous gas)
UN No.	UN 1056
Shipping Label	Non-flammable, non-poisonous gas

IATA

Proper Shipping Name	Krypton, compressed
Hazard Class	2.2 (Non-flammable, non-corrosive and non-poisonous gas)
UN No.	UN 1056
Shipping Label	Non-flammable, non-poisonous gas

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15. REGULATORY INFORMATION

US Federal regulations

TSCA	Krypton (CAS No. 7439-90-9) is listed.
SARA Section 311/312	Sudden release of pressure hazard; immediate (acute) health hazard
International Regulations	
Canada	Krypton (CAS No. 7439-90-9) is listed on the Canadian DSL WHMIS Classification: Class A – Compressed Gas
EU Regulations	Krypton (CAS No. 7439-90-9) is listed on the EEC inventory EINECS
EC No. 1272/2008 [CLP]	Classification: Compressed Gas H280
Directive 67/548/EEC {DSD}]	
Or 1999/45/EC [DPD]	Not classified
National Regulations	Listed on AICS, IECSC, Korean ECL, PICCS
	US State Regulations Not listed in California Proposition 65's carcinogens list, developmental toxicity list, reproductive toxicity (female) list or reproductive toxicity (male) list

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16. OTHER INFORMATION

Prepared By	ISOFLEX USA PO Box 472615 San Francisco CA 94147 United States
Issuing Date	January 19, 2015
Revision Date	October 16, 2024
Revision Number	4
Revision Note	Update supplier address

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
AICS	Australian Inventory of Chemical Substances
ALARA	As Low As Is Reasonably Achievable
AMU	Atomic Mass Unit
ANSI	American National Standards Institute
BLS	Basic Life Support
BOD5	Biochemical Oxygen Demand
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)
COD	Chemical Oxygen Demand
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

ECL	Korean Existing Chemicals List
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
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
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
PICCS	Philippines Inventory of Chemicals and Chemical Substances
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
RQ	Reportable Quantity
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendments and Reauthorization Act (USA)
SNUR	Significant New Use Rule (TSCA)
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.

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