Material Safety Data Sheet

Section 1 – Product and Company Identification

Product Name:	Tritium Gas Calibration Cylinder Model 10017-LB Radioactive material – Tritium gas diluted in Argon gas Contents under pressure (600-1200 psig) in lecture bottle cylinder (0.4 Liters volume)
Company	Overhoff Technology Corporation
Street Address	1160 US Route 50
City, State, Zip, Country	Milford, Ohio 45150, USA
Telephone:	513 248 2400
Fax:	513 248 2402

Section 2 – Composition/Information on Ingredients

Substance Name	Argon
CAS#	7440–37–1
Concentration %:	Higher than 99.9
OHSHA PEL:	Simple Asphyxiant
OHSHA STEL:	NONE
ACGIH TLV:	Simple Asphyxiant
Substance Name	Tritium
CAS#	10028-17-8
Concentration %:	Less than 10^{-5} (volume), each Cylinder Contains Between 0.1 – 1.0 milliCuries (3.7 – 37 Mega Becquerels) of Radioactivity, NRC regulations consider this to be an exempt quantity

Section 3 – Hazards Identification

Emergency Overview:	The majority of the gas mixture is argon. This is a colorless, odorless and nonflammable gases. The main health hazards associated with Argon is asphyxiation by displacement of oxygen. A cylinder rupture hazard exists when the gas mixture which is under pressure is subject to heat or flames. The tritium gas portion is small by volume but is hazardous because it is radioactive.
Route(s) of Entry:	Inhalation?: YES Skin?: YES Ingestion?: NO
Health Hazards: (Acute and Chronic)	Toxic: Gas mixture is radioactive, may cause cancer, possible risk of impaired fertility, possible risk to the unborn child, harmful by inhalation.
Medical Conditions Generally Aggravated By Exposure:	NONE

Section 4 – First Aid Measures

Route(s) of Entry:	Inhalation?: YES Skin?: YES Ingestion?: NO
Signs and Symptoms of Exposure:	High concentration of the gas mixture can cause an oxygen deficient environment. This can occur when the entire contents of the cylinder are accidently released especially if released in a poorly ventilated area. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing of the ears, dizziness, drowsiness, unconsciousness, vomiting and depression of all the senses. Under some circumstances of over exposure, death may occur. There is also a radiological hazard from exposure to tritium.
Emergency and First Aid Procedure:	Remove to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardiopulmonary resuscitation, if necessary. Seek medical attention immediately. With regard to the radiological hazard from exposure to tritium, wash exposed skin surfaces as soon as possible. Drink copious quantities of fluids especially water that is not contaminated by tritium. Collect 20mL urine samples hourly, for liquid scintillation analysis by a licensed radiological lab. Continue until severity of exposure has been determined by health physics oriented medical staff.

Section 5 - Firefighting Measures

Flash Point (Method Used):	Not Applicable
Flammable Limits:	
LEL:	Not Applicable
UEL:	Not Applicable
Extinguishing Media:	Use extinguishable materials appropriate for surrounding materials in the fire.
Unusual Fire and Explosion:	This gas does not burn, however, cylinders, when involved in the fire, may rupture or burst in the heat of the fire. Water spray should be used to cool fire exposed cylinders.
Special Fire Fighting Procedures:	Firefighters should wear eye protection self-contained breathing apparatus and full equipment

Section 6 – Accidental Release Measures

Steps to Be Taken in Case Material is Released or Spilled

Person Related Safety Precautions:	Wear protective equipment. Keep unprotected persons away, ensure adequate ventilation.
Measures for Environmental Protection:	Inform authorities in case of release. Contact radiological affairs support office for specific instructions.

Section 7 – Handling and Storage

Precautions in Handling & Storing:	Cylinders should be stored in a well ventilated, secure area, protected from the weather. Storage temperatures should not exceed 125° F (52° C) and area should be free of combustible materials.
Other Precautions:	Avoid areas where salt or other corrosive materials are present. Keep valve tightly closed and receptacle tightly sealed.
Work/Hygienic Practices:	Keep away from food stuffs, beverages and feed. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Store protective clothing separately.

Section 8 – Exposure Controls/Personal Protection

Respiratory Protection (Specify Type)

General Use:	None Required
Ventilation:	Recommended
Local Exhaust:	Use Fume hood
Protective Gloves:	Impervious
Eye Protection:	Safety glasses
Other Protective Clothing or Equipment:	In case of intensive or longer exposure use respiratory protection devices that are independent of circulatory air.
Special, in case of accidental release:	NIOSH approved respirator

Section 9 – Physical/Chemical Characteristics

	TRITIUM GAS
Half life	12.43 yrs
Specific Activity	9,545 Ci/g
Power Density	0.328 W/g
Activity Density (T_2 gas, 1 atm, 0°C)	2.589 Ci/cm^3
(T_2 gas, 1 atm, 25°C)	2.372 Ci/cm^3

	ARGON GAS
Boiling Point:	-185.85° C (-302.53° F)
Specific Gravity (H_2O = 1):	1.38
Vapor Pressure (mm Hg.):	Not Applicable
Vapor Density (AIR = 1):	1.38
Freezing Point:	-199.3° C (-308.8° F)
Evaporation Rate (Butyl Acetate = 1):	Not Applicable
Solubility in Water:	Slight
Appearance and Odor:	Colorless, Odorless Gas

Section 10 – Stability and Reactivity

Stability:	Unstable **Stable** ✓
Thermal Decomposition/Conditions to Avoid:	No decomposition if used according to specifications.
Incompatibility (Materials to Avoid):	NONE
Hazardous Decomposition or Byproducts:	No dangerous decomposition products known.
Hazardous Polymerization:	May Occur **Will Not Occur** ✓
Conditions to Avoid:	No dangerous reactions known.

Section 11 – Toxicological Information

Acute Toxicity:	Primary irritant effect: On the skin: No irritant effect. On the eye: No irritant effect.
Sensitization:	No sensitizing effect known.
Additional Toxicological Information:	This product contains tritium (Hydrogen-3) gas. Each cylinder contains between 0.1 – 1 milliCuries (3.7 –37 Mega Becquerels) of radioactivity. This is an exempt quantity for tritium. The possession, use and distribution of this product may be subject to local, federal or international regulations.

Section 12 - Ecological Information

Ecological (General Notes):	Generally not hazardous for water

Section 13 – Disposal Considerations

Waste Disposal Method:	Must not be disposed of with solid waste. Dispose in accordance with applicable federal, state and local regulations. Contact radiological affairs support office.

Section 14 – Transport Information

DOT Regulations:	Hazard Class: 2.2 ID Number: UN1956
Proper shipping Name:	Compressed Gas, N.O.S.
Special Shipping Information:	Never transport in passenger compartment of vehicle.

P.O. Box 182, 1160 U.S. Route 50, Milford, Ohio, 45150-9705 USA
Telephone 513 248 2400 Facsimile 513 248 2402
e-mail sales@overhoff.com
website http://www.overhoff.com

Section 15 – Regulatory Information

Sara Title III:	Not Listed
US Federal:	The product has been classified and marked in accordance with regulations on hazardous materials. According to NRC regulations, the amount of tritium is below that to consider an exempt quantity.
Hazard Symbols:	T Toxic.
Risk phrases:	45 May cause cancer. 62 Possible risk of impaired fertility. 63 Possible risk of harm to the unborn child. 20 Harmful by inhalation.
Safety phrases:	2 Keep out of the reach of children. 9 Keep container in a well-ventilated place. 16 Keep away from surfaces of ignition – no smoking. 33 Take precautionary measures against static discharges.
National Regulations:	Water Hazard Class: Generally not hazardous for water.
State Regulator Information:	N/P
Canadian Regulations:	This gas mixture would be categorized as a controlled product. According to CNSC regulations, amount of tritium is below that to considered an exempt quantity. Hazard Classes: **A** (compressed gas)

Section 16 – Other Information

MSDS Print Date:	13 November 2008	
MSDS Revision Date:		
NFPA Ratings Scale 0 – 4:	Health:	4
	Flammability:	0
	Reactivity:	0

P.O. Box 182, 1160 U.S. Route 50, Milford, Ohio, 45150-9705 USA
Telephone 513 248 2400 Facsimile 513 248 2402
e-mail sales@overhoff.com
website http://www.overhoff.com