



# SAFETY DATA SHEET

## SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

- Date Prepared:
- Commercial Identity:
- CAGE Code: 88236
- Manufacturer's Name: Communications & Power Industries  
beverly microwave division
- Manufacturer's Address: 150 Sohler Road, Beverly, MA 01915-5595
- Telephone Number for Information: (978) 922-6000, M-F, 8 a.m. - 5 p.m.
- Prepared by: Robert A. Davenport, Jr.
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- Email: [bob.davenportjr@cpil.com](mailto:bob.davenportjr@cpil.com)
- Government contract / Order Number:
- National Stock Number:
- Specification:
- Type, grade, class: Not Applicable
- Emergency Telephone Number: (978) 922-6000, Ext. 230

## SECTION 2 – HAZARDS IDENTIFICATION

- Hazardous Item: Yes, FED-STD-313, paragraph 3.2.3,  
Federal Supply Class 5960 - contains radioactive isotope

**GHS Label: None required**

**Signal Word: None required**

- General: *This device is a receiver protector tube which contains a small amount of Cobalt 60 (not more than 1 microcuries) and a small amount of Tritium (H3) (not more than 150 millicuries). This tube is an exempt device and normal handling will present no radiation problems. This device is a manufactured article in accordance with 49CFR 173.422. This device is an article in accordance with 29CFR 1910.1200. This device is an electron tube manufactured in compliance with 10CFR 30.15(a) (8).*

## SECTION 3A COMPOSITION / INFORMATION ON INGREDIENTS (Cobalt 60)

- NIOSH Identification Number: Not Applicable
- Name of Hazardous Ingredient: Cobalt 60
- Non-Radioactive Materials: Not Applicable
- Radioactive Materials: Cobalt 60
  - Form: Normal - Solid
  - Radioactivity:
- OSHA Permissible Exposure Limit: No Information Found
- ACGIH TLV: No Information Found
- Other Exposure Limits: 5000 millirems per year. See 10CFR Part 20.
- Percentage: Less than 1%



### SECTION 3B – COMPOSITION / INFORMATION ON INGREDIENTS (Tritium)

- NIOSH Identification Number: *Not Applicable*
- Name of Hazardous Ingredient: *Tritium ( $H^3$  or T) as  $TiT_2$*
- Non-Radioactive Materials: *Not Applicable*
- Radioactive Materials: *Tritium ( $H^3$  or T) as  $TiT_2$* 
  - Form: *Normal - Solid*
  - Radioactivity:
- Percentage: *Less than 1%*

### SECTION 4A – FIRST AID MEASURES (Cobalt)

- Skin Contact: *Immediately flush with water for 15 minutes*
- Eye Contact: *Immediately flush with water for 15 minutes*
- Inhalation: *Remove to fresh air, restore, and / or support his or her breathing, as needed.*
- Ingestion: *Never give anything by mouth to someone who is unconscious or convulsing. If Cobalt salts are ingested, give one to two glasses of water and induce vomiting.*

### SECTION 4B – FIRST AID MEASURES (Tritium)

- Skin Contact: *Immediately flush with water for 15 minutes*
- Eye Contact: *Immediately flush with water for 15 minutes*
- Inhalation: *Remove to fresh air*
- Ingestion: *A high oral fluid intake should be administered following Tritium exposure.*

### SECTION 5A & B – FIREFIGHTING MEASURES

- Flashpoint: *Not Applicable*
- Flammable (explosive) Limits: *Not Applicable*
- Extinguishing Media: *Not Applicable*
- Special Firefighting Procedures: *Not Applicable*
- Special Fire and Explosion Hazards: *Not Applicable*

### SECTION 6A & B – ACCIDENTAL RELEASE MEASURES

- Steps Taken If Device Is Damaged: *See attached "Products Operating Safety Precautions" sheet (VAR-F-0835).*

### SECTION 7A & B – HANDLING AND STORAGE

- Precautions Taken in Handling and Storage: *See attached "Products Operating Safety Precautions" sheet (VAR-F-0835).*
- Other Precautions: *See attached "Products Operating Safety Precautions" sheet (VAR-F-0835).*



## SECTION 8A & B – EXPOSURE CONTROLS / PERSONAL PROTECTION

- OSHA Permissible Exposure Limit: *No Information Found*
- ACGIH TLV: *No Information Found*
- Other Exposure Limits: *5000 millirems per year. See 10CFR Part 20.*
- Respiratory Protection (Specify Type): *If spilled, wear radionuclide cartridge respirator*
- Ventilation: *Place affected component in local exhaust*
- Protective Gloves: *Disposable gloves*
- Eye Protection: *Goggles*
- Other Protective Clothing or Equipment: *Not Applicable*
- Work / Hygienic Practices: *Wash Hands*
- Neutralizing Agent: *Not Applicable*

## SECTION 9A – PHYSICAL AND CHEMICAL PROPERTIES (Cobalt 60)

- Freezing (Melting) Point: *(1495°C)*
- Boiling Point: *2900°C*
- Evaporation Rate: *Not Applicable*
- Vapor Pressure: *< 10<sup>-9</sup> torr at 20°C*
- Vapor Density: *Not Applicable*
- Appearance and Odor: *Silver colored metal / no odor.*
- Specific Gravity: *8.9 (water = 1.0)*
- Solubility in Water: *Negligible*
- Percentage Volatile by Volume: *Not Applicable*
- Viscosity: *Not Applicable*
- pH: *Not Applicable*
- Auto ignition Temperature: *Not Applicable*
- Decomposition Temperature: *Not Applicable*
- Magnetism: *Not Applicable*
- Corrosion Rate: *Not Applicable*

## SECTION 9B – PHYSICAL AND CHEMICAL PROPERTIES (Tritium)

- Freezing (Melting) Point: *-259°C*
- Boiling Point: *-252°C*
- Evaporation Rate: *Not Applicable*
- Vapor Pressure: *18.317 atmospheres*
- Vapor Density: *Not Applicable*
- Appearance and Odor: *The radioactive material is installed as Titanium Tritide (TiT<sub>2</sub>), a solid in the TR section. Once the device is used, decomposition of the Titanium Tritide (TiT<sub>2</sub>) will release Tritium Gas. Therefore, radioactive material may exist within the TR section in both solid and gas states. The Tritium is installed in other sections as a gas. No odor.*
- Specific Gravity: *6.0 (water = 1.0)*
- Solubility in Water: *100%*
- Percentage Volatile by Volume: *Not Applicable*
- Viscosity: *Not Applicable*
- pH: *Not Applicable*
- Auto ignition Temperature: *Not Applicable*
- Decomposition Temperature: *Not Applicable*
- Magnetism: *Not Applicable*
- Corrosion Rate: *Not Applicable*



#### SECTION 10A - STABILITY AND REACTIVITY (Cobalt 60)

- Stability: *Stable*
- Conditions to Avoid (Stability): *Not Applicable*
- Incompatibility (Materials to Avoid): *None Known*
- Hazardous Decomposition Product: *None Known*
- Hazardous Polymerization: *Will not occur*
- Condition to Avoid (Polymerization): *Not Applicable*

#### SECTION 10B – STABILITY AND REACTIVITY (Tritium)

- Stability: *Stable*
- Conditions to Avoid (Stability): *Temperatures in excess of 400°C will cause decomposition of  $TiT_2$  with release of Tritium gas.*
- Incompatibility (Materials to Avoid): *Oxidizers*
- Hazardous Decomposition Product: *Unbound tritium*
- Hazardous Polymerization: *Will not occur*
- Condition to Avoid (Polymerization): *Not Applicable*

#### SECTION 11A – TOXICOLOGICAL INFORMATION (Cobalt 60)

##### Part A (Cobalt 60 as Radioactive)

- The primary Route(s) of Entry: *Inhalation, ingestion, and skin*
- Effects of (Acute & Chronic) Overexposure: *Significant skin contact may result in burns. Rapid estimation of the amount of internal contamination is difficult or impossible when alpha or pure beta emitters are involved.*
- Cancer Causing Agent: *Beta or gamma rays*
- Signs and Symptoms of Exposure: *Nausea and vomiting and diarrhea for high acute doses*
- Medical Conditions Aggravated by Exposure: *Healing of damaged tissues may be prolonged.*
- Emergency and First-Aid Procedures: *Decontaminate the exposed individual. Transport to a hospital if nausea and vomiting occur in the first 24 hours.*

##### Part B (Cobalt 60 as a metal)

- Primary Route(s) of Entry: *Skin contact and inhalation*
- Effects of Overexposure: *Contact dermatitis and breathing difficulties*
- Effects of Chronic Overexposure: *Allergic asthma, restricted pulmonary functions, and internal fibrosis may be caused by long-term occupational exposure to cobalt and its compounds*
- Cancer Causing Agent: *Cobalt metal/powder is not listed as a carcinogen by the NTP. IARC or OSHA.*
- Signs and symptoms of Exposure: *Inhalation of cobalt dust can cause pulmonary symptoms such as wheezing, irritation of the upper respiratory tract (URT) and hypersensitivity reactions (asthma). Skin contact with powdered cobalt may cause adenitis, especially in the creases of the elbows, knees, ankles, and neck. Contact with eyes may cause conjunctivitis. Ingestion may produce a hot sensation along with vomiting, diarrhea, and nausea.*
- Medical Conditions Aggravated by Exposure: *Disorders of the skin and the URT may be worsened by exposure to cobalt; administer pre-placement and periodic medical exams emphasizing these functions. Target Organs: Respiratory system, skin, bladder, kidneys, and eyes. Primary Entry: Skin contact, inhalation. Acute Effects: Contact dermatitis and breathing difficulties. Chronic Effects: Allergic asthma, restricted pulmonary functions, and interstitial fibrosis may be caused by long-term occupational exposure to cobalt or its compounds.*



#### SECTION 11B – TOXICOLOGICAL INFORMATION (Tritium)

- The Primary Route(s) of Entry: *Inhalation, ingestion, and skin contact.*
- Effects of (Acute & Chronic) Overexposure: *Significant exposure to a radionuclide may cause cancer.*
- Cancer Causing Agent: *Not listed as a carcinogen in NTP, IARC or OSHA.*
- Signs and Symptoms of Exposure: *Tritium is a beta emitter. If exposure is suspected, seek medical attention, urine analysis for tritium is the only means of measuring the degree of exposure.*
- Medical Conditions aggravated by Exposure: *Healing of damaged tissues may be prolonged*

#### SECTION 12 – ECOLOGICAL INFORMATION

- Ecotoxicity: *None known*

#### SECTION 13 – DISPOSAL CONSIDERATIONS

- EPA Hazardous Waste Number / Code: *Not Applicable*
- Hazardous Waste Characteristics: *Not Applicable*
- Disposal Methods: *This tube is an exempt device. This device is exempt from controlled disposal by the NRC regulation 10 CFR 30.15 (a). This device should not be intentionally damaged, altered, or disassembled prior to disposal. This device should be disposed of in accordance with federal, state and local laws and regulations.*

#### SECTION 14 – TRANSPORT INFORMATION

- Applicable Regulations: *49CFR (Ground) / IATA (Air)*
- Shipping Name (Ground & Air): *Radioactive Material, Excepted package, Instruments or Articles.*
- Identification Number (Ground & Air): *UN2911*
- Reportable Quantity: *No*
- Hazard Class: *Class 7 Radioactive Material*
- Labels (Ground): *UN2911 label*
- Labels (Air): *Radioactive Material, Excepted Package*
- Unit Container:
- DOT Specification Container: *No*
- DOT Exemption Number / Department of Defense (DOD) Certification Control Number (CCN): *49CFR 173.421-1 additional requirements for excepted packages containing class 7 (radioactive) materials and 49CFR 173.424 exceptions for instruments and articles.*
- Net Explosive Weight: *Not Applicable*
- Limited Quantity: *Yes*
- Aerosol Propellant(s): *Not Applicable*
- US Postal Service Regulations: *May Be Mailed*

#### SECTION 15 – REGULATORY INFORMATION

- NRC License Number: *02-2374, 20-02237-03E*
- EPA Registration Number: *Not Applicable*

#### SECTION 16 – OTHER INFORMATION

- Revision Information / Reason for revision: *Issue date August 25, 2014 / Rewrite to new SDS format*
- Revision Information / Reason for revision: *Revision date May 2016 / Update Section 9B*
- Revision Information / Reason for revision: *Revision date August 9, 2022 / Update SDS format*