

**1. IDENTIFICATION**

Product Name: **PMET 88-12**  
 Typical Use: Thermal Spray Powder  
 Manufacturer: Polymet Corporation  
 7397 Union Centre Blvd  
 West Chester, OH 45014  
 (513) 874-3586 from 8 a.m. – 5 p.m., EST

**2. HAZARDS IDENTIFICATION**

The article is NOT classified as dangerous according to directive 1999/45/EC.  
 BYPRODUCTS GENERATED DURING THE THERMAL SPRAY OR WELDING PROCESS ARE CONSIDERED HAZARDOUS.



**WARNING**



**DANGER**

**HAZARD STATEMENTS:**

- May cause cancer by inhalation
- May cause an allergic skin reaction

**PRECAUTIONARY STATEMENTS:**

- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Avoid breathing dust or fume
- Wear protective gloves, protective clothing, eye, and face protection
- Contaminated work clothing should not be allowed out of the workplace
- If exposed or concerned, get medical advice/attention

See Section 11 for more detailed information on health effects and symptoms.

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

Component	CAS No.	EC No.	Weight %	Classification
Cobalt	7440-48-4	231-158-0	12	Xn, R42/43-53; S-22-24-37
Tungsten	7440-33-7	231-143-9	Balance	Not Classified
Carbon	7440-44-0	231-153-3	<5	Not Classified

See Section 15 for the full text of the R and S phrases declared above.

**4. FIRST-AID MEASURES**

These measures apply primarily to the byproducts produced during thermal spray or welding.

- Inhalation:** Move exposed person to fresh air. Keep the person warm and at rest. If not breathing or if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Obtain medical attention if symptoms occur. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Ingestion:** Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep the person warm and at rest. If material has been swallowed and the exposed person is conscious, give

small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Obtain medical attention if symptoms occur. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Skin Contact:** Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Obtain medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Eye Contact:** Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

**Protection of First Aiders:** No action shall be taken involving any personal risk or without suitable training.

See Section 11 for more detailed information on health effects and symptoms.

**5. FIRE-FIGHTING MEASURES**

This section applies primarily to the powder as supplied.

Extinguishing Media

**Suitable:** Use an extinguishing agent suitable for the surrounding fire.

**Not Suitable:** None known

**Special Exposure Hazards:** Extremely fine material can, with great difficulty, be ignited, but only weakly propagates combustion. Do not disturb burning metal while extinguishing the fire. Interrupt metal path and allow the fire to burn out.

**Hazardous Thermal Decomposition Products:** Some metallic oxides

**Special Protective Equipment for Fire-Fighters:** Fire-fighters should wear appropriate protective equipment and self-contained apparatus (SCBA) with a full face-piece operated in positive pressure mode.

**Special Protective Precautions for Fire-Fighters:** Heat and flames cause emittance of acrid smoke and fumes. Do not release runoff from fire control methods to sewers or waterways. Firefighters should wear full face-piece self-contained breathing apparatus and chemical protective clothing with thermal protection. Direct water stream will scatter and spread flames and, therefore, should not be used.

**6. ACCIDENTAL RELEASE MEASURES**

These measures apply to the powder as supplied and the byproducts produced during the thermal spray or welding process.

**Personal Precautions:** Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment.

**Environmental Precautions:** Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

**Methods for Cleaning Up:** Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, state, and local regulations. Follow applicable OSHA regulations (29 CFR 1910.120) and all other pertinent state and federal requirements. Recycle if possible.

**7. HANDLING AND STORAGE**

This section applies primarily to the powder as supplied.

**Handling:** Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking.

**Storage:** Keep container tightly closed. Keep container in a cool, well ventilated area.

Packaging Materials

**Recommended:** Use original container.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

This section contains information which applies during the welding and thermal spray processes.

Components	OSHA PEL (mg/m <sup>3</sup> )	ACGIH TLV (mg/m <sup>3</sup> )
Cobalt	0.1	0.02
Tungsten	–	3 respirable; 0.005 thoratic
Carbon	15 total dust, 5 respirable	10 inhalable, 2 respirable

**Monitoring Procedures:** If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to European Standard EN 689 for methods for the assessment of

exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.

Exposure Controls

- Occupational Exposure: Use process enclosures, local exhaust ventilation or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
- Respiratory Protection: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hand Protection: Gloves should be worn to minimize contact. During the thermal spray process, heat insulated gloves are recommended.
- Eye Protection: Safety glasses or goggles are recommended when handling this material. During the thermal spray process, safety goggles and dark lenses must be worn.
- Skin Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Hearing Protection: During the thermal spray process, the operator and other personnel close to the spray operation must be protected from excessive noise. Hearing protection that meets local standards should be used.
- Hygiene Measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

---

**9. PHYSICAL AND CHEMICAL PROPERTIES**

This section applies primarily to the powder as supplied.

Appearance

- Physical State: Solid (powder)
- Color: Metallic grey
- Odor: Odorless
- Odor Threshold: Not Available

Important Health, Safety and Environmental Information

- pH: Not Applicable
- Boiling Point: Not Available
- Melting Point: >1300°C
- Flash Point: Not Available
- Explosive Properties: Thermal Spray Byproducts – Fine dust clouds may form explosive mixtures in air.
- Explosion Limits: Not Available
- Oxidizing Properties: Not expected based on chemical composition.
- Vapor Pressure: Not Applicable
- Relative Density: Varies with composition of product
- Solubility: Insoluble in water
- Viscosity: Not Applicable
- Vapor Density: Not Applicable
- Evaporative Rate: Not Applicable

Other Information

- Auto-Ignition Temperature: Not Available

---

**10. STABILITY AND REACTIVITY**

This section applies primarily to the powder as supplied.

- Stability: The product is stable under normal storage conditions.
- Conditions to Avoid: Store in a cool dry place away from incompatible materials.
- Materials to Avoid: Strong acids
- Hazardous Decomposition Products: During the thermal spray or welding processes, gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by radiation from the arc.

---

**11. TOXICOLOGICAL INFORMATION**

This information applies to the powder as supplied and the byproducts produced during the thermal spray process.

Potential Acute Health Effects

**Inhalation:** Exposure to high concentrations may result in health complaints. Irritating to respiratory system. Exposure may result in depressed respiration, coughing, nausea and sore throat. Prolonged or repeated exposure to large amounts may cause damage to lungs (lung edema).

**Ingestion:** Prolonged or repeated exposure may be irritating to mouth, throat and esophagus (sore throat, nausea).

**Skin:** Exposure to high concentrations may result in health complaints. Prolonged or repeated exposure may be irritating (redness, pain).

**Eyes:** Moderately irritating to eyes.

**Acute Toxicity:**

Component	Test	Result	Route	Species
Cobalt	LDLo	750 mg/kg	Oral	Rabbit
	LD50	6170 mg/kg	Oral	Rat

**Potential Chronic Health Effects**

**Carcinogenicity:** Contains material which may cause cancer, based on animal data. Risk of cancer depends on duration and level of exposure.

**Mutagenicity:** No known significant effects or critical hazards.

**Reproductive Toxicity:** No known significant effects or critical hazards.

**Over-Exposure Signs / Symptoms**

**Target Organs:** Contains material which causes damage to the following organs: blood, kidneys, lungs, upper respiratory tract, skin, central nervous system (CNS), eye lens or cornea.

**12. ECOLOGICAL INFORMATION**

This information applies to the powder as supplied.

**Ecotoxicity Data:** No known significant effects or critical hazards.

**Other Adverse Effects:** No known significant effects or critical hazards.

**13. DISPOSAL CONSIDERATIONS**

This information applies to the powder as supplied and the byproducts produced during the thermal spray process.

**Methods of Disposal:** Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

**Disposal of Packaging:** Contaminated packaging material should be disposed of in the same manner as the product itself. Non-contaminated or clean packaging material should be reused for the same product, treated as domestic waste or material for recycling.

**Hazardous Waste:** The classification of the product and byproducts may meet the criteria for a hazardous waste.

**14. TRANSPORT INFORMATION**

This information applies to the powder as supplied.

**International Transport Regulations**

Regulatory Information	UN Number	Proper Shipping Name	Class	Packing Group	Label	Additional Information
ADR/RID Class	Not Regulated					
ADNR Class	Not Regulated					
IMDG Class	Not Regulated					
IATA Class	Not Regulated					

**15. REGULATORY INFORMATION**

This information applies to the powder as supplied.

**SARA Section 313 Supplier Notification:**

The product covered by this MSDS may contain the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know act of 1986 and of 40 DFR 372: Chromium, Copper, Manganese and Nickel. Refer to Section 3 of this MSDS for percentage of each element by weight and CAS number.



**Hazard Symbol:** Harmful

Risk Phrases: R40 – Limited evidence of a carcinogenic effect  
R42/43: May cause sensitization by inhalation and skin contact.  
R15 – Contact with water liberates extremely flammable gases  
R10 – Flammable

Safety Phrases: S22 – Do not breathe dust  
S24 – Avoid contact with skin  
S37 – Wear suitable protective gloves

Contains: Nickel

Product Use: Classification and labeling have been performed according to EU Directives 67/548/EEC and 1999/45/EC (including amendments) and the intended use.

Industrial Applications: Used by spraying or welding.

---

**16. OTHER INFORMATION**

This information applies to the powder as supplied and the byproducts produced during the thermal spray or welding process.

Full Text of Classifications: Carc. Cat. 3 – Carcinogen Category 3  
F – Highly Flammable  
Xn – Harmful

**History**

Date of Issue: 02/13/2023  
Revision #: 1  
Date of Revision: 11/08/2023

**Notice to Reader**

To the best of our knowledge, the information contained herein is accurate. However, the above named supplier does not assume liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.