1. IDENTIFICATION

Product Name: PMet 290

Typical Use: Thermal Spray Wire

Manufacturer: Polymet Corporation
7397 Union Centre Blvd
West Chester, OH 45014
(513) 874-3586 from 8 a.m. – 5 p.m., EST

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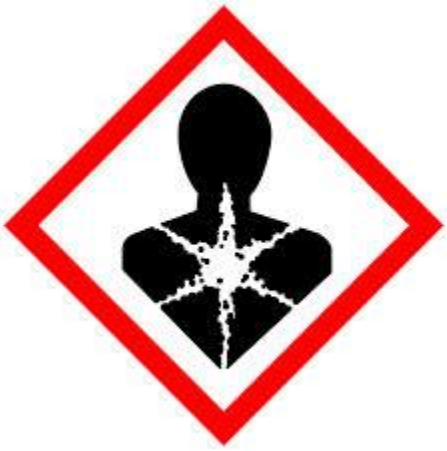
2. HAZARDS IDENTIFICATION

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.

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3. COMPOSITION / INFORMATION ON INGREDIENTS

Components	CAS No.	EC No.	wt. %	Classification
Iron	7439-89-6	231-096-4	balance	Not Classified
Carbon	7440-44-0	231-153-3	0.1-5	Not Classified
Chromium	7440-47-3	231-157-5	25-30	Not Classified
Boron	7440-42-8	231-151-2	0.1-5	Xn; R15
Manganese	7439-96-5	231-105-1	0.1-5	Not Classified
Nickel	7440-02-0	231-111-4	5-10	Carc. Cat. 3; R40, R43
Silicon	7440-21-3	231-130-8	0.1-5	Not Classified

See Section 16 for the full text of the R-phrases declared above.

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4. FIRST-AID MEASURES

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

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.

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5. FIRE-FIGHTING MEASURES

This section applies primarily to the wire as supplied.

Extinguishing Media

Suitable:	Use an extinguishing agent suitable for the surrounding fire.
Not Suitable:	None known
Special Exposure Hazards:	No specific hazard
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.

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6. ACCIDENTAL RELEASE MEASURES

These measures apply to the wire as supplied and the byproducts produced during the thermal spray 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:	Use appropriate tools to transfer the spilt solid to a convenient waste disposal container. Recycle if possible.

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7. HANDLING AND STORAGE

This section applies primarily to the wire 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.

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

This section contains information which applies during the thermal spray process.

Components	OSHA PEL (mg/m^3)	ACGIH TLV (mg/m^3)
Iron (oxide fume)	10	5
Carbon	15 total dust, 5 respirable	10 inhalable, 2 respirable
Chromium*	0.5 (as Cr III) 0.005 (as Cr VI)	0.003 (as Cr III) 0.0005 (as Cr VI)
Chromium metal*	1	0.5
Boron	15 total dust, 5 respirable	10 (dust)
Manganese (fume)	5	0.02
Nickel**	1	0.1 (soluble compounds)
Silicon	15 total dust, 5 respirable	10 inhalable, 3 respirable

Additional Information: * A portion of metallic chromium may be converted during the welding process to hexavalent chromium. Hexavalent chromium is classified as an IARC Group 1 carcinogen. NTP classifies hexavalent chromium as Known to be Carcinogenic.

** A portion of nickel may be converted during the welding process to nickel compounds which are classified as an IARC Group 1 Carcinogen. NTP classifies nickel compounds as Known to be Carcinogenic.

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.

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9. PHYSICAL AND CHEMICAL PROPERTIES

This section applies primarily to the wire as supplied.

General Information

Appearance

Physical State: Solid (wire)
Color: Silver
Odor: Odorless
Odor Threshold: Not Available

Important Health, Safety and Environmental Information

pH:	Not Applicable
Boiling Point:	Not Available
Melting Point:	1538°C (based on Fe strip)
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:	~2 g/cc
Solubility:	Insoluble in water
Viscosity:	Not Applicable
Vapor Density:	Not Applicable
Evaporative Rate:	Not Applicable

Other Information

Auto-Ignition Temperature: Not Available

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10. STABILITY AND REACTIVITY

This section applies primarily to the wire 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 process, gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by radiation from the arc.

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11. TOXICOLOGICAL INFORMATION

This information applies to the wire 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

Components	Test	Result	Route	Species
Boron	LD50	650 mg/kg	Oral	Rat
	LD50	310 mg/kg	Oral	Rabbit
	LD50	250 mg/kg	Oral	Cat
Manganese	LD50	9000 mg/kg	Oral	Rat
Nickel	LDLo	5 mg/kg	Oral	Guinea Pig
Silicon	LD50	3160 mg/kg	Oral	Rat

Potential Chronic Health Effects

Nickel	Carcinogen Category 3; R40, R43
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.

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12. ECOLOGICAL INFORMATION

This information applies to the wire as supplied.

Ecotoxicity Data

Components	Species	Period	Result
Manganese	Daphnia magna (EC50)	48 hours	40 mg/l

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

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13. DISPOSAL CONSIDERATIONS

This information applies to the wire 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.

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14. TRANSPORT INFORMATION

This information applies to the wire 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					

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15. REGULATORY INFORMATION

This information applies to the wire 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.

EU Regulations

Risk Phrases: This product is not classified according to EU legislation.

Safety Phrases: S23 – Do not breathe fumes
S36/37 – Wear suitable protective clothing and gloves
S38 – In case of insufficient ventilation, wear suitable respiratory equipment
S51 – Use only in well ventilated areas

Contains: Nickel

Product Use: Classification and labeling have been performed according to regulation (EC) No 1907/2006 (including amendments) and the intended use.

Industrial Applications: Used by spraying.

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16. OTHER INFORMATION

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

Full Text of R-phrases: R15 Contact with water liberates extremely flammable gases

Full Text of Classifications:	Xn – Harmful

History

Date of Issue:	11/04/19
Revision #:	1
Date of Revision:	11/15/2023

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.