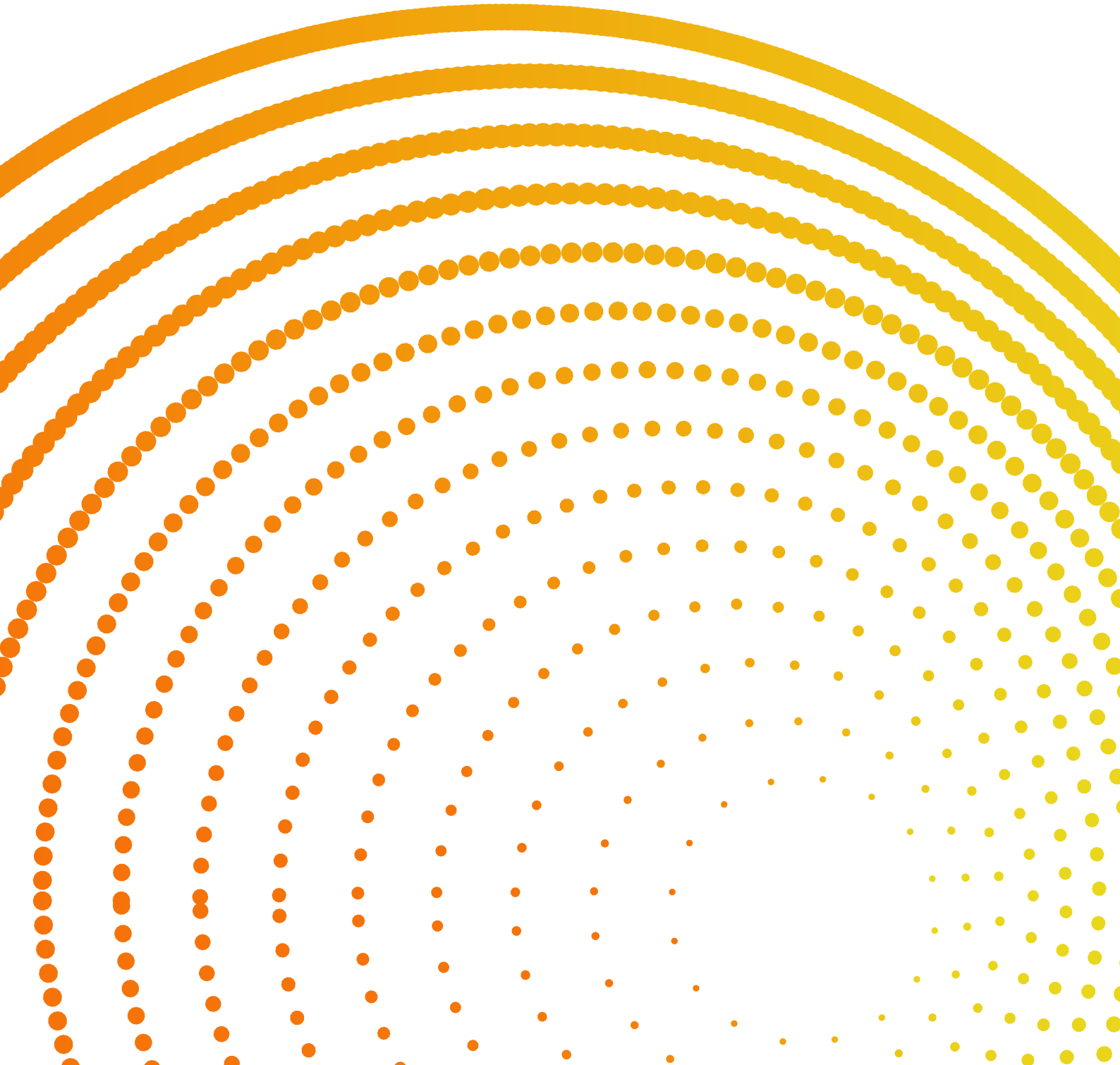
Safety Data Sheet for Grinding Balls/Rods

MOLYCOP

Safety Data/Material Safety Data Sheet



Section 1: Identification

Product Name:	Grinding Balls and Grinding Rods
Synonyms:	Not available.
Product Use:	Grinding balls are used in the milling process of metalliferous ores.
Restrictions on Use:	For use in wet grinding applications only.
Manufacturer/Supplier:	Moly-Cop USA 8116 Wilson Road Kansas City, MO 64125
Phone Number:	(816) 231-9191
Emergency Phone:	(816) 678-1750
Date of Preparation of SDS:	June 6, 2019

Section 2: Hazard(s) Identification

GHS Information

Classification:	Not hazardous according to OSHA criteria (29 CFR 1910.1200).
WARNING:	At the end of their normal life cycle, worn ball scats may be in a state of high residual stress from repeated impacts. Ball scats may spall or fragment without warning as the residual stress is relieved. When handling ball scats, gloves and face shields or goggles should be worn.

Label Elements

Hazard Pictogram(s):	None.
Signal Word:	None.
Hazard Statements:	Not applicable.

Precautionary Statements

Prevention:	Not applicable.
Response:	Not applicable.
Storage:	Not applicable.
Disposal:	Not applicable.
Hazards Not Otherwise Classified:	Not applicable.
Ingredients with Unknown Toxicity:	6% of this product mixture consists of ingredient(s) of unknown acute toxicity.

This material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Section 3: Composition / Information on Ingredients

Composition / Information on Ingredients

Hazardous Ingredient(s)	Common name/ Synonyms	CAS No.	% wt./wt.
Iron	Not available	7439-89-6	75 - 100
Chromium	Not available	7440-47-3	0 - 0.1, 0.1 - 1, 1 - 5
Carbon	Not available	1333-86-4	0 - 0.1, 0.1 - 1, 1 - 1.5
Manganese	Not available	7439-96-5	0 - 0.1, 0.1 - 1
Nickel	Not available	7440-02-0	0 - 0.1, 0.1 - 1
Silicon	Not available	7440-21-3	0 - 0.1, 0.1 - 0.5
Copper	Not available	7440-50-8	0 - 0.1, 0.1 - 0.5
Antimony	Not available	7440-36-0	0 - 0.1, 0.1 - 0.5
Arsenic	Not available	7440-38-2	0 - 0.1, 0.1 - 0.5
Cobalt	Not available	7440-48-4	0 - 0.1, 0.1 - 0.5
Lead	Not available	7439-92-1	0 - 0.1, 0.1 - 0.5

Multiple ranges given due to batch-to-batch variability.

Section 4: First-Aid Measures

Inhalation: Inhalation of the product is unlikely.

Acute and delayed symptoms and effects: As supplied, the product does not pose an inhalation hazard. The product is used in wet environments; inhalation of the dust resulting from the grinding process is unlikely.

Eye Contact: As supplied, the product is unlikely to pose a hazard in case of contact. At the end of their normallife cycle, ball scats may spall or fragment without warning. In case of contact with ball fragments, get medical advice/attention immediately.

Acute and delayed symptoms and effects: As supplied, the product is unlikely to pose a hazard in case of contact. At the end of their normal life cycle, worn ball scats may be in a state of high residual stress from repeated impacts. Ball scats may spall or fragment without warning; contact with such fragments may seriously injure the eyes.

Skin Contact: As supplied, the product is unlikely to pose a hazard in case of contact. At the end of their normal life cycle, ball scats may spall or fragment without warning. In case of contact with ball fragments, get medical advice/attention.

Acute and delayed symptoms and effects: As supplied, the product is unlikely to pose a hazard in case of contact. At the end of their normal life cycle, worn ball scats may be in a state of high residual stress from repeated impacts. Ball scats may spall or fragment without warning; contact with such fragments may injure the skin.

Ingestion: Not a normal route of exposure.

Acute and delayed symptoms and effects: Not a normal route of exposure.

General Advice: In case of accident or if you feel unwell, seek medical advice immediately (show the label or SDS where possible).

Note to Physicians: Symptoms may not appear immediately.

Section 5: Fire-Fighting Measures

Flammability and Explosion Information

Not flammable or combustible by OSHA/WHMIS criteria. As supplied the product does not pose a flammability hazard.

Sensitivity to Mechanical Impact: As supplied this material is not sensitive to mechanical impact.

Sensitivity to Static Discharge: As supplied this material is not sensitive to static discharge.

Means of Extinction

Suitable Extinguishing Media: Use appropriate extinguishing media for surrounding fire. Move containers from fire area if you can do it without risk.

Unsuitable Extinguishing Media: Not available.

Products of Combustion: Not available.

Protection of Firefighters: Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may cause pollution. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

Section 6: Accidental Release Measures

Emergency Procedures: Keep unauthorized personnel away. Ventilate closed spaces before entering.

Personal Precautions: Grinding balls may cause a slip, trip or fall hazard. Do not touch or walk through spilled material.

Environmental Precautions: Keep any dust generated out of drains, sewers, ditches, and waterways.

Methods for Containment: Do not flush any dust generated to sewer or allow to enter waterways.

Methods for Clean-Up: If sufficient dust is generated: Sweep up and shovel into suitable containers for disposal.

Other Information: See Section 13 for disposal considerations.

Section 7: Handling and Storage

Handling: Do not breathe dust or fumes. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Work clothing contaminated with dust resulting from the grinding process should not be allowed out of the workplace. See Section 8 for information on Personal Protective Equipment.

Storage: Store away from incompatible materials. See Section 10 for information on Incompatible Materials.

Section 8: Exposure Controls / Personal Protection

Exposure Guidelines Component

Iron [CAS No. 7439-89-6]	**ACGIH:**	10 mg/m³ (TWA) (Inhalable.); 3 mg/m³ (TWA) (Respirable.); For Particles (Insoluble or Poorly Soluble) Not Otherwise Specified
	OSHA:	15 mg/m³ (Total dust) (TWA), 5 mg/m³ (Respirable fraction) (TWA); For Particulates Not Otherwise Regulated (PNOR)
Chromium [CAS No. 7440-47-3]	**ACGIH:**	0.5 mg/m³ (TWA); A4 (1991); For Chromium and inorganic compounds, as Cr; Metal and Cr III compounds
	OSHA:	No PEL established
Carbon [CAS No. 1333-86-4]	**ACGIH:**	3 mg/m³ (TWA); A3; Inhalable fraction (2010)
	OSHA:	3.5 mg/m³ (TWA)
Manganese [CAS No. 7439-96-5]	**ACGIH:**	0.02 mg/m³ (TWA) (Respirable fraction); 0.1 mg/m³ (TWA) (Inhalable fraction); A4 (2012)
	OSHA:	5 mg/m³ (as Mn) (C); 1 mg/m³ (TWA); 3 mg/m³ (STEL) [Vacated]
Nickel [CAS No. 7440-02-0]	**ACGIH:**	1.5 mg/m³ (TWA); A5; Inhalable fraction (1996); For Nickel, as Ni, Elemental
	OSHA:	1 mg/m³ (as Ni) (TWA); 0.1 mg/m³ (TWA) [Vacated]
Silicon [CAS No. 7440-21-3]	**ACGIH:**	10 mg/m³ (TWA) (Inhalable.); 3 mg/m³ (TWA) (Respirable.); For Particles (Insoluble or Poorly Soluble) Not Otherwise Specified
	OSHA:	15 mg/m³ (Total dust) (TWA), 5 mg/m³ (Respirable fraction) (TWA); 10 mg/m³ (Total dust) (TWA) [Vacated]
Copper [CAS No. 7440-50-8]	**ACGIH:**	0.2 mg/m³ (TWA); (1990); For Fume, as Cu
	OSHA:	0.1 mg/m³ (TWA) (Fume (as Cu)); 1 mg/m³ (TWA) (Dusts and mists (as Cu))
Antimony [CAS No. 7440-36-0]	**ACGIH:**	0.5 mg/m³ (TWA); (1979)
	OSHA:	0.5 mg/m³ (as Sb) (TWA)
Arsenic [CAS No. 7440-38-2]	**ACGIH:**	0.01 mg/m³ (TWA); A1; BEI (1990); For Arsenic and inorganic compounds, as As
	OSHA:	No PEL established
Cobalt [CAS No. 7440-48-4]	**ACGIH:**	0.02 mg/m³ (TWA); A3; BEI (1993); For Cobalt and inorganic compounds, as Co
	OSHA:	0.1 mg/m³ (as Co) (TWA); For Cobalt metal, dust, and fume (as Co). 0.05 mg/m³ (TWA) [Vacated]; For Cobalt metal, dust, and fume (as Co)
Lead [CAS No. 7439-92-1]	**ACGIH:**	0.05 mg/m³ (TWA); A3; BEI (1991); For Lead and inorganic compounds, as Pb
	OSHA:	0.1 mg/m³ (as Co) (TWA); For Cobalt metal, dust, and fume (as Co). 0.05 mg/m³ (TWA) [Vacated]; For Cobalt metal, dust, and fume (as Co)

PEL: Permissible Exposure Limit / **TWA:** Time-Weighted Average / **STEL:** Short-Term Exposure Limit / **C:** Ceiling

Engineering Controls: Not normally required. If there is the possibility of the dust resulting from the grinding process to accumulate and dry out, use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, gas, etc.) below recommended exposure limits.

Personal Protective Equipment (PPE)

Eye/Face Protection: Wear safety glasses. Wear a face shield or goggles when handling ball scats. Use equipment for eye protection that meets the standards referenced by CSA Standard CAN/CSA-Z94.3-92 and OSHA regulations in 29 CFR 1910.133 for Personal Protective Equipment.

Hand Protection: Wear protective gloves when handling ball scats.
Consult manufacturer specifications for further information.

Skin and Body Protection: Wear protective clothing.

Respiratory Protection: Respiratory protection is not normally required. The product is used in wet environments; inhalation of the dust resulting from the grinding process is unlikely.

General Hygiene Considerations: Handle according to established industrial hygiene and safety practices. Consult a competent industrial hygienist to determine hazard potential and/or the PPE manufacturers to ensure adequate protection.

Section 9: Physical and Chemical Properties

Appearance:	1.0″ to 6.5″ in diameter metal balls.
Color:	Silver / Metallic grey.
Odor:	Odorless.
Odor Threshold:	Not available.
Physical State:	Solid.
pH:	Not available.
Melting Point / Freezing Point:	1510 to 1530 °C (2750 to 2786 °F).
Initial Boiling Point:	Not available.
Boiling Range:	Not available.
Flash Point:	Not available.
Evaporation Rate:	Not available.
Flammability (solid, gas):	See Section 5.
Lower Flammability Limit:	Not available.
Upper Flammability Limit:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Relative Density:	Not available.
Solubilities:	Insoluble in water.
Partition Coefficient: n-Octanol/Water:	Not available.
Auto-ignition Temperature:	Not available.
Decomposition Temperature:	Not available.
Viscosity:	Not available.
Percent Volatile, wt. %:	Not available.
VOC content, wt. %:	Not available.
Density:	Not available.
Coefficient of Water/Oil Distribution:	Not available.

Section 10: Stability and Reactivity

Reactivity:	Contact with incompatible materials.
Chemical Stability:	Stable under normal storage conditions.
Possibility of Hazardous Reactions:	Not available.
Conditions to Avoid:	Contact with incompatible materials.
Incompatible Materials:	Acids. Oxidizers. Strong reducers. Reducers. Water. Oxides of nitrogen. Halogens. Acetaldehyde. Metal carbonates. Metal acetylides. Metal hexafluorides.
Hazardous Decomposition Products:	Not available.

Section II: Toxicological Information

Effects of Acute Exposure

Product Toxicity

Oral: Not available.

Dermal: Not available.

Inhalation: Not available.

Component Toxicity

Component	CAS No.	LD_{50} oral	LD_{50} dermal	LC_{50}
Iron	7439-89-6	30000 mg/kg (rat)	Not available	Not available
Chromium	7440-47-3	Not available.	Not available	Not available
Carbon	1333-86-4	> 15400 mg/kg (rat)	3000 mg/kg (rabbit)	Not available
Manganese	7439-96-5	9000 mg/kg (rat)	Not available	Not available
Nickel	7440-02-0	5000 mg/kg (rat)	Not available	Not available
Silicon	7440-21-3	3160 mg/kg (rat)	Not available	Not available
Copper	7440-50-8	Not available.	Not available	Not available
Antimony	7440-36-0	7000 mg/kg (rat)	Not available	Not available
Arsenic	7440-38-2	145 mg/kg (mouse)	Not available	Not available
Cobalt	7440-48-4	6171 mg/kg (rat)	Not available	Not available
Lead	7439-92-1	Not available.	Not available	Not available

Likely Routes of Exposure: Eye contact. Skin contact. Inhalation. Ingestion. Skin absorption.

Target Organs: Skin. Eyes. Gastrointestinal tract.

Symptoms (including delayed and immediate effects)

Inhalation: As supplied, the product does not pose an inhalation hazard. The product is used in wet environments; inhalation of the dust resulting from the grinding process is unlikely.

Eye: As supplied, the product is unlikely to pose a hazard in case of contact. At the end of their normal life cycle, worn ball scats may be in a state of high residual stress from repeated impacts. Ball scats may spall or fragment without warning; contact with such fragments may seriously injure the eyes.

Skin: As supplied, the product is unlikely to pose a hazard in case of contact. At the end of their normal life cycle, worn ball scats may be in a state of high residual stress from repeated impacts. Ball scats may spall or fragment without warning; contact with such fragments may injure the skin.

Ingestion: Not a normal route of exposure.

Skin Sensitization: Not available.

Respiratory Sensitization: Not available.

Medical Conditions Aggravated by Exposure: Not available.

Effects of Chronic Exposure (from short and long-term exposure)

Target Organs: Skin. Eyes. Gastrointestinal tract.

Chronic Effects: As supplied, the product is unlikely to pose a chronic health hazard. The product is used in wet environments; inhalation of the dust resulting from the grinding process is unlikely.

Carcinogenicity: As supplied, the product is unlikely to pose a chronic health hazard.

Component Toxicity

Component	ACGIH	IARC	NTP	OSHA	Prop 65
Chromium	A4	Group 3	Not listed	Not listed	Not listed
Manganese	A4	Not listed	Not listed	Not listed	Not listed
Carbon	A3	Group 2B	Not listed	OSHA Carcinogen	Listed
Nickel	A5	Group 2B	List 2	OSHA Carcinogen	Listed
Arsenic	A1	Group 1	List 1	OSHA Carcinogen	Listed
Cobalt	A3	Group 2B	Not listed	OSHA Carcinogen	Listed
Lead	A3	Group 2B	List 2	OSHA Carcinogen	Listed

Mutagenicity: May cause heritable genetic damage.

Reproductive Effects: The product is unlikely to pose a reproductive hazard.

Developmental Effects Teratogenicity: The product is unlikely to harm the unborn child.

Developmental Effects

Teratogenicity: The product is unlikely to harm the unborn child.

Embryotoxicity: The product is unlikely to harm the unborn child.

Toxicologically Synergistic Materials: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

Persistence / Degradability: Not available.

Bioaccumulation / Accumulation: Not available.

Mobility in Environment: Not available.

Other Adverse Effects: Not available.

Section 13: Disposal Considerations

Disposal Instructions: Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

Section 14: Transport Information

U.S. Department of Transportation (DOT)

Proper Shipping Name: Not regulated.

Class: Not applicable.

UN Number: Not applicable.

Packing Group: Not applicable.

Label Code: Not applicable.

Canada Transportation of Dangerous Goods (TDG)

Proper Shipping Name: Not regulated.

Class: Not applicable.

UN Number: Not applicable.

Packing Group: Not applicable.

Label Code: Not applicable.

Section 15: Regulatory Information

Chemical Inventories

US (TSCA): The components of this product are in compliance with the chemical notification requirements of TSCA.

Canada (DSL): The components of this product are in compliance with the chemical notification requirements of the NSN Regulations under CEPA, 1999.

Federal Regulations

Canada: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

WHMIS Classification: Not a controlled product.

Hazard Symbols: None.

United States: This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SARA Title III

Component	Section 302 (EHS) TPQ (lbs.)	Section 304 EHS RQ (lbs.)	CERCLA RQ (lbs.)	Section 313	RCRA CODE	CAA 112(r) TQ (lbs.)
Chromium	Not listed	Not listed	5000	313	Not listed	Not listed
Manganese	Not listed	Not listed	Not listed	313	Not listed	Not listed
Nickel	Not listed	Not listed	100	313	Not listed	Not listed
Copper	Not listed	Not listed	5000	313	Not listed	Not listed
Antimony	Not listed	Not listed	5000	313	Not listed	Not listed
Arsenic	Not listed	Not listed	1	313	Not listed	Not listed
Cobalt	Not listed	Not listed	Not listed	313	Not listed	Not listed
Lead	Not listed	Not listed	10	313	Not listed	Not listed

State Regulations

Massachusetts US Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000).

Component	CAS No.	RTK List
Chromium	7440-47-3	E
Carbon	1333-86-4	Listed
Manganese	7439-96-5	Listed
Nickel	7440-02-0	E
Silicon	7440-21-3	Listed
Copper	7440-50-8	Listed
Antimony	7440-36-0	Listed
Arsenic	7440-38-2	E
Cobalt	7440-48-4	Listed
Lead	7439-92-1	Listed

Note: E = Extraordinarily Hazardous Substance.

New Jersey US New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5).

Component	CAS No.	RTK List
Chromium	7440-47-3	SHHS
Carbon	1333-86-4	SHHS
Manganese	7439-96-5	SHHS
Nickel	7440-02-0	SHHS
Silicon	7440-21-3	SHHS
Copper	7440-50-8	Listed
Antimony	7440-36-0	Listed
Arsenic	7440-38-2	SHHS
Cobalt	7440-48-4	SHHS
Lead	7439-92-1	SHHS

Note: SHHS = Special Health Hazard Substance.

State Regulations continued from previous page:

Pennsylvania US Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323).

Component	CAS No.	RTK List
Chromium	7440-47-3	Listed
Carbon	1333-86-4	Listed
Manganese	7439-96-5	Listed
Nickel	7440-02-0	Listed
Silicon	7440-21-3	Listed
Copper	7440-50-8	Listed
Antimony	7440-36-0	Listed
Arsenic	7440-38-2	Listed
Cobalt	7440-48-4	Listed
Lead	7439-92-1	Listed

Note: E = Extraordinarily Hazardous Substance.

California Prop 65 WARNING: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Component	Type of Toxicity
Nickel	cancer
Carbon	cancer
Arsenic	cancer
Cobalt	cancer
Lead	cancer; developmental, female, male

Section 16: Other Information

Disclaimer: The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for his own particular use.

Date of Preparation of SDS: June 6th, 2019

Version: 2.0

GHS SDS Prepared by: Moly-Cop USA
www.Molycop.com

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