

Issue date 07-Dec-2018

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Revision Number 1

1. IDENTIFICATION

Product identification

Product identifier	Cronatron™ 201 Wear Disc Plate
Other means of identification	P12981
Recommended use	Brazing Alloy
Restrictions on use	These items are only intended for normal welding purposes, For industrial use only

Supplier

Corporate Headquarters:
Cronatron, A Lawson Brand
Lawson Products, Inc.
8770 W.Bryn Mawr Ave.- Suite 900
Chicago, IL 60631
1-866-529-7664

Canadian Distribution Center:
Lawson Canada
7315 Rapistan Court
Mississauga, ON L5N 5Z4
(800) 323-5922

24 Hour Emergency Phone Number (888) 426-4851 (Prosar)

2. HAZARD(S) IDENTIFICATION

Hazard Classification This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Symbol

Signal word Not applicable

Hazard statements Not applicable

Precautionary statements

General Not applicable

Prevention Not applicable

Response

General Not applicable

Storage	Not available
Disposal	P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable
Hazard(s) Not Otherwise Classified (HNOC)	None known.
Physical Hazards Not Otherwise Classified (PHNOC)	When this product is used in a welding process the most important hazards are: heat, radiation, electric shock and welding fumes.
Unknown acute toxicity	None known

3. COMPOSITION/INFORMATION ON INGREDIENTS

Composition Mixture.

Chemical name	CAS-No	Weight %
Iron Oxide	1309-37-1	60-100
Manganese	7439-96-5	1-2
Chromium	7440-47-3	0-1
Carbon	7440-44-0	0-1
Copper	7440-50-8	0-1
Sulfur	7704-34-9	0-1
Silicon	7440-21-3	0-1
Cobalt	7440-48-4	0-1
Arsenic	7440-38-2	0-1
Aluminum	7429-90-5	0-1
Nickel	7440-02-0	0-.45
Vanadium pentoxide	1314-62-1	0-1
Molybdenum	7439-98-7	0-1
Phosphorus	7723-14-0	0-1
Zinc	7440-66-6	0-1
Tin	7440-31-5	0-1
Niobium	7440-03-1	0-1
Lead	7439-92-1	0-1
Boron Oxide	1303-86-2	0-1
Titanium Dioxide	13463-67-4	0-1
Nitrogen	7727-37-9	0-1
Calcium Carbonate	1317-65-3	0-5
Antimony	7440-36-0	0-1

4. FIRST-AID MEASURES

Necessary first-aid measures

General Information	Call for medical aid. Employ First Aid techniques recommended by the Red Cross.
Inhalation	Remove to fresh air. If breathing is difficult, give oxygen. Administer artificial respiration if not breathing. If breathing has stopped, contact emergency medical services immediately.
Ingestion	Seek medical attention immediately.
Skin contact	Wash affected area with soap and water to remove dust or particles. If rash develops, see a physician. For skin burns from arc radiation, promptly flush with cold water. Get medical attention for burns or irritations that persist.

Eye contact	Flush with a large amount of fresh water for at least 15 minutes to remove dusts or fumes. For radiation burns due to arc flash, see physician.
Most important symptoms (acute)	Not available.
Most important symptoms (over-exposure)	Not available.
Indication of any immediate medical attention and special treatment needed	In case of ELECTRIC SHOCK: Disconnect and turn off the power. Use a nonconductive material to pull victim away from contact with live wire parts or wires. If breathing has stopped, begin artificial respiration and obtain medical assistance immediately. If no detectable pulse, begin Cardiopulmonary Resuscitation. (CPR) and immediately call for medical aid.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Use the extinguishing media recommended for the burning material and fire situation.
Unsuitable extinguishing media	Not available.
Specific hazards	Welding arc and sparks can ignite combustibles. Refer to American National Standard Z49.1 for fire prevention during welding. These products as shipped are non-hazardous, non-flammable, non-explosive, and non-reactive. Thermal decomposition can lead to release of irritating gases and vapors.
Special protective equipment for fire-fighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Reasonably expected fume constituents of the fume could include complex oxides of iron and nickel.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Solid objects may be picked up and placed in a container. Make sure the solid objects are at room temperature before handling. Gloves should be worn when handling to prevent cuts.
Methods and materials for containment and cleaning up	Do not flush residue into waterways.

7. HANDLING AND STORAGE

Precautions for safe handling	Before using this product, contact your doctor to determine if exposure to this product or use of this product will aggravate your medical conditions. Handle with care to avoid cuts and prevent the wire from piercing the skin. Wear gloves. Some individuals may develop an allergic reaction to certain materials. Keep all warning and identification labels on the product. Avoid exposure to dust and do not ingest. Gloves should be worn when handling to prevent cuts. Warn wearers of heart pacemakers or other medical electronic equipment vital to life that welding operations may impede the function of the medical device. Handle with care to avoid damaging the product and keep product dry.
Conditions for safe storage, including any incompatibilities	Keep material sealed and dry before use. After using, keep remaining product sealed and dry and do not remove product identification label or warning label.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical name	OSHA PEL (TWA)	ACGIH OEL (TWA)	NIOSH - TWA
Iron Oxide	10 mg/m ³ TWA 15 mg/m ³ TWA 5 mg/m ³ TWA	5 mg/m ³ TWA	5 mg/m ³ TWA
Manganese	5 mg/m ³ Ceiling	0.02 mg/m ³ TWA 0.1 mg/m ³ TWA	3 mg/m ³ STEL 1 mg/m ³ TWA 1 mg/m ³ TWA
Chromium	1 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA
Carbon	-	-	-
Copper	0.1 mg/m ³ TWA 1 mg/m ³ TWA	0.2 mg/m ³ TWA 1 mg/m ³ TWA	1 mg/m ³ TWA 0.1 mg/m ³ TWA 1 mg/m ³ TWA
Sulfur	-	-	-
Silicon	15 mg/m ³ TWA 5 mg/m ³ TWA	-	10 mg/m ³ TWA 5 mg/m ³ TWA
Cobalt	0.1 mg/m ³ TWA	0.02 mg/m ³ TWA	0.05 mg/m ³ TWA
Arsenic	10 µg/m ³ TWA	0.01 mg/m ³ TWA	-
Aluminum	15 mg/m ³ TWA 5 mg/m ³ TWA	1 mg/m ³ TWA	10 mg/m ³ TWA 5 mg/m ³ TWA 5 mg/m ³ TWA 5 mg/m ³ TWA
Nickel	1 mg/m ³ TWA	1.5 mg/m ³ TWA	0.015 mg/m ³ TWA 0.015 mg/m ³ TWA
Vanadium pentoxide	-	0.05 mg/m ³ TWA	-
Molybdenum	15 mg/m ³ TWA	10 mg/m ³ TWA 3 mg/m ³ TWA	-
Phosphorus	-	-	-
Zinc	-	-	-
Tin	2 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWA 2 mg/m ³ TWA
Niobium	-	-	-
Lead	50 µg/m ³ TWA 50 µg/m ³ TWA	0.05 mg/m ³ TWA	0.050 mg/m ³ TWA 0.050 mg/m ³ TWA
Boron Oxide	15 mg/m ³ TWA	10 mg/m ³ TWA	10 mg/m ³ TWA
Titanium Dioxide	-	-	-
Nitrogen	-	-	-
Calcium Carbonate	15 mg/m ³ TWA 5 mg/m ³ TWA	-	10 mg/m ³ TWA 5 mg/m ³ TWA
Antimony	0.5 mg/m ³ TWA 0.5 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA 0.5 mg/m ³ TWA

Appropriate engineering controls

Adequate ventilation should be provided to keep exposure levels below current acceptable exposure limits. Read and understand the manufacturer's instructions and precautionary label on this product. Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below the TLV's in the workers breathing zone and the general area. Train welder to keep head out of fumes. Monitor fume levels and do not exceed permissible exposure limits or values. Wear head, hand and body protection which help prevent injury from radiation, sparks, heat, and electrical shock. See ANSI Z49.1. When the electrode is consumed, the fume and gas decomposition products are different in percent and form from the ingredients listed in Section 3. Fume and decomposition products, not the ingredients in the electrode, are important. Decomposition products include those originating from the volatilization, reaction or oxidation of the wire or rod plus those from the base metal and coating. These components are virtually always present as complex oxides and not as metals. Reasonably expected fume constituents of the fume could include complex oxides of iron and nickel.

Individual protection measures, such as personal protective equipment

Eye protection

Wear a helmet or face shield with a filter lens of shade 12 or darker. Provide screens and flash goggles to shield others.

Skin and body protection

Wear head, hand, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum, this includes welders' gloves and a protective face shield and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to touch live electrical parts and to

insulate themselves from work and ground, especially if clothing and gloves are wet.

Respiratory protection

Use respirable fume respirator or air supplied respirator when welding in a confined space or where local exhaust or ventilation does not keep exposure below the TLV's.

Hygiene measures

Do not eat, drink or smoke when using this product. Handle in accordance with good industrial hygiene and safety practice.

Canadian Province Occupational Exposure Limits

Chemical name	Alberta OEL	British Columbia OEL	Manitoba OEL	New Brunswick - OEL	Newfoundland and Labrador - OEL	Nova Scotia - OEL	Ontario OEL	Prince Edward Island - OEL	Quebec OEL	Saskatchewan - OEL
Iron Oxide	5 mg/m ³ TWA	10 mg/m ³ STEL 10 mg/m ³ TWA 3 mg/m ³ TWA 5 mg/m ³ TWA	5 mg/m ³ TWA	5 mg/m ³ TWA 10 mg/m ³ TWA	5 mg/m ³ TWA	5 mg/m ³ TWA	5 mg/m ³ TWA	5 mg/m ³ TWA	5 mg/m ³ TWA 10 mg/m ³ TWA	10 mg/m ³ STEL 20 mg/m ³ STEL 5 mg/m ³ TWA 10 mg/m ³ TWA
Manganese	0.2 mg/m ³ TWA	0.2 mg/m ³ TWA 0.2 mg/m ³ TWA	0.02 mg/m ³ TWA 0.1 mg/m ³ TWA	0.2 mg/m ³ TWA	0.02 mg/m ³ TWA 0.1 mg/m ³ TWA 0.02 mg/m ³ TWA 0.1 mg/m ³ TWA	0.02 mg/m ³ TWA 0.1 mg/m ³ TWA	0.2 mg/m ³ TWA 0.02 mg/m ³ TWA 0.1 mg/m ³ TWA	0.02 mg/m ³ TWA 0.1 mg/m ³ TWA 0.02 mg/m ³ TWA 0.1 mg/m ³ TWA	0.2 mg/m ³ TWA 0.2 mg/m ³ TWA	0.6 mg/m ³ STEL 0.2 mg/m ³ TWA 0.2 mg/m ³ TWA
Chromium	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA	1.5 mg/m ³ STEL 0.5 mg/m ³ TWA
Carbon	-	-	-	-	-	-	-	-	-	-
Copper	0.2 mg/m ³ TWA 1 mg/m ³ TWA	1 mg/m ³ TWA 0.2 mg/m ³ TWA	0.2 mg/m ³ TWA 1 mg/m ³ TWA	0.2 mg/m ³ TWA 1 mg/m ³ TWA	0.2 mg/m ³ TWA 1 mg/m ³ TWA	0.2 mg/m ³ TWA 1 mg/m ³ TWA	0.2 mg/m ³ TWA 1 mg/m ³ TWA	0.2 mg/m ³ TWA 1 mg/m ³ TWA	0.2 mg/m ³ TWA 1 mg/m ³ TWA	0.6 mg/m ³ STEL 3 mg/m ³ STEL 0.2 mg/m ³ TWA 1 mg/m ³ TWA
Sulfur	10 mg/m ³ TWA	-	-	-	-	-	-	-	-	-
Silicon	-	10 mg/m ³ TWA 3 mg/m ³ TWA	-	10 mg/m ³ TWA	-	-	-	-	10 mg/m ³ TWA	20 mg/m ³ STEL 10 mg/m ³ TWA
Cobalt	0.02 mg/m ³ TWA	0.02 mg/m ³ TWA 0.02 mg/m ³ TWA	0.02 mg/m ³ TWA	0.02 mg/m ³ TWA	0.02 mg/m ³ TWA 0.02 mg/m ³ TWA	0.02 mg/m ³ TWA	0.02 mg/m ³ TWA 0.02 mg/m ³ TWA	0.02 mg/m ³ TWA 0.02 mg/m ³ TWA	0.02 mg/m ³ TWA 0.02 mg/m ³ TWA	0.06 mg/m ³ STEL 0.02 mg/m ³ TWA 0.02 mg/m ³ TWA
Arsenic	0.01 mg/m ³ TWA	0.01 mg/m ³ TWA 0.01 mg/m ³ TWA	0.01 mg/m ³ TWA	0.01 mg/m ³ TWA	0.01 mg/m ³ TWA 0.01 mg/m ³ TWA	0.01 mg/m ³ TWA	0.05 mg/m ³ STEL 0.01 mg/m ³ TWA 0.01 mg/m ³ TWA 0.01 mg/m ³ TWA 0.01 mg/m ³ TWA	0.01 mg/m ³ TWA 0.01 mg/m ³ TWA	0.1 mg/m ³ TWA 0.1 mg/m ³ TWA	0.03 mg/m ³ STEL 0.01 mg/m ³ TWA 0.01 mg/m ³ TWA
Aluminum	10 mg/m ³ TWA 5 mg/m ³ TWA	1.0 mg/m ³ TWA	1 mg/m ³ TWA	10 mg/m ³ TWA 5 mg/m ³ TWA	1 mg/m ³ TWA	1 mg/m ³ TWA	1 mg/m ³ TWA	1 mg/m ³ TWA	10 mg/m ³ TWA 5 mg/m ³ TWA 5 mg/m ³	20 mg/m ³ STEL 10 mg/m ³ STEL 10 mg/m ³

Chemical name	Alberta OEL	British Columbia OEL	Manitoba OEL	New Brunswick - OEL	Newfoundland and Labrador - OEL	Nova Scotia - OEL	Ontario OEL	Prince Edward Island - OEL	Quebec OEL	Saskatchewan - OEL
									TWAEV	TWA 5 mg/m ³ TWA
Nickel	1.5 mg/m ³ TWA	0.05 mg/m ³ TWA	1.5 mg/m ³ TWA	1 mg/m ³ TWA	1.5 mg/m ³ TWA	1.5 mg/m ³ TWA	1 mg/m ³ TWA	1.5 mg/m ³ TWA	1 mg/m ³ TWAEV	3 mg/m ³ STEL 1.5 mg/m ³ TWA
Vanadium pentoxide	0.05 mg/m ³ TWA	0.05 mg/m ³ TWA	0.05 mg/m ³ TWA	0.05 mg/m ³ TWA	0.05 mg/m ³ TWA	0.05 mg/m ³ TWA	0.05 mg/m ³ TWA	0.05 mg/m ³ TWA	0.05 mg/m ³ TWAEV	0.15 mg/m ³ STEL 0.05 mg/m ³ TWA
Molybdenum	10 mg/m ³ TWA 3 mg/m ³ TWA	3 mg/m ³ TWA 10 mg/m ³ TWA 3 mg/m ³ TWA 10 mg/m ³ TWA	3 mg/m ³ TWA 10 mg/m ³ TWA	10 mg/m ³ TWA	3 mg/m ³ TWA 10 mg/m ³ TWA 3 mg/m ³ TWA 10 mg/m ³ TWA	3 mg/m ³ TWA 10 mg/m ³ TWA	10 mg/m ³ TWA 3 mg/m ³ TWA 10 mg/m ³ TWA 3 mg/m ³ TWA	3 mg/m ³ TWA 10 mg/m ³ TWA 3 mg/m ³ TWA 10 mg/m ³ TWA	10 mg/m ³ TWAEV	20 mg/m ³ STEL 6 mg/m ³ STEL 10 mg/m ³ TWA 3 mg/m ³ TWA 10 mg/m ³ TWA 3 mg/m ³ TWA
Phosphorus	0.1 mg/m ³ TWA	-	-	0.02 ppm TWA 0.1 mg/m ³ TWA	-	-	-	-	0.1 mg/m ³ TWAEV	-
Zinc	-	-	-	-	-	-	-	-	-	-
Tin	2 mg/m ³ TWA	2 mg/m ³ TWA 2 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWA 2 mg/m ³ TWA	2 mg/m ³ TWA	2 mg/m ³ TWA 2 mg/m ³ TWA	2 mg/m ³ TWA 2 mg/m ³ TWA	2 mg/m ³ TWAEV 2 mg/m ³ TWAEV	4 mg/m ³ STEL 2 mg/m ³ TWA 2 mg/m ³ TWA
Niobium	-	-	-	-	-	-	-	-	-	-
Lead	0.05 mg/m ³ TWA	0.05 mg/m ³ TWA 0.05 mg/m ³ TWA	0.05 mg/m ³ TWA	0.05 mg/m ³ TWA	0.05 mg/m ³ TWA 0.05 mg/m ³ TWA	0.05 mg/m ³ TWA	0.05 mg/m ³ TWA 0.05 mg/m ³ TWA 0.05 mg/m ³ TWA 0.05 mg/m ³ TWA	0.05 mg/m ³ TWA 0.05 mg/m ³ TWA	0.05 mg/m ³ TWAEV 0.05 mg/m ³ TWAEV	0.15 mg/m ³ STEL 0.05 mg/m ³ TWA 0.05 mg/m ³ TWA
Boron Oxide	10 mg/m ³ TWA	10 mg/m ³ TWA	10 mg/m ³ TWA	10 mg/m ³ TWA	10 mg/m ³ TWA	10 mg/m ³ TWA	10 mg/m ³ TWA	10 mg/m ³ TWA	10 mg/m ³ TWAEV	20 mg/m ³ STEL 10 mg/m ³ TWA
Titanium Dioxide	-	-	-	-	-	-	-	-	-	-
Nitrogen	-	-	-	-	-	-	-	-	-	-
Calcium Carbonate	10 mg/m ³ TWA	20 mg/m ³ STEL 10 mg/m ³ TWA 3 mg/m ³ TWA	-	10 mg/m ³ TWA	-	-	-	-	10 mg/m ³ TWAEV	20 mg/m ³ STEL 10 mg/m ³ TWA
Antimony	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA 0.5 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA 0.5 mg/m ³ TWA	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA 0.5 mg/m ³ TWA	0.5 mg/m ³ TWA 0.5 mg/m ³ TWA	0.5 mg/m ³ TWAEV 0.5 mg/m ³ TWAEV	1.5 mg/m ³ STEL 0.5 mg/m ³ TWA 0.5 mg/m ³ TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state Solid

Color Metallic, Gray

Odor	None
Odor threshold	Not available
pH	Not applicable
Melting point/range °C	1510
Melting point/range °F	2750
Boiling point/range °C	Not available
Boiling point/range °F	Not available
Flash point °C / °F	Not available
Evaporation rate	Not available
Flammability (Solid, Gas)	Not available
Lower explosion limit	Not available
Upper explosion limit	Not available
Vapor pressure	Not applicable
Vapor density	Not available
Relative density	Not available
Solubility	insoluble
Partition coefficient (n-octanol/water)	Not available
Autoignition temperature °C	Not available
Autoignition temperature °F	Not available
Decomposition temperature °C	Not available
Decomposition temperature °F	Not available
Viscosity	Not available

10. STABILITY AND REACTIVITY

Reactivity	Contact with chemical substances like acids or strong bases could cause generation of gas.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Not available.
Incompatible materials	Contact with chemical substances like acids or strong bases could cause generation of gas.
Hazardous decomposition	When this product is used in a welding process, hazardous decomposition products would

products

include those from volatilization, reaction or oxidation of the materials listed in section 3 and those from the base metal and coating. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may also be formed by radiation from the arc. Refer to applicable national exposure limits for the fume compounds. Reasonably expected fume constituents of the fume could include complex oxides of iron and nickel. Zinc oxide. The employer should contact an occupational health professional for doing fume monitoring to determine fumes emitted and to ensure compliance to the applicable country limits. Other country exposure limits may be different and the appropriate country standards should be used. Manganese also has a low exposure limit in the USA.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Dermal. Inhalation. Eyes.

Symptoms

Welding fumes cannot be classified simply. Their composition and quantity are dependent upon the metal being welded, the process, procedures and electrodes being used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: Coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and the amount of ventilation, position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities). The International Agency for Research on Cancer has classified welding fumes as possibly carcinogenic to humans (group 2B). Pre-existing respiratory or allergic conditions may be aggravated in some individuals (i.e. asthma, emphysema). Overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat or eyes. Primary route of entry is the respiratory system. Iron, iron oxide, manganese: remove from overexposure and apply artificial respiration if needed. Fluoride compounds produced may cause eye and skin burns, and pulmonary edema bronchitis. Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death. Nickel, Nickel oxide: May cause metallic taste, nausea, tightness in chest, fever, and allergic reactions. Ingestion not an expected route of entry, but if ingested product could cause serious injury. Arc Rays can injure eyes. Spatter and molten metal can cause burn injuries. Electric shock can kill. Skin cancer has been reported from arc radiation. May cause an allergic skin reaction. Warn wearers of heart pacemakers or other medical electronic equipment vital to life that welding operations may impede the function of the medical device.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Long term exposure may lead to siderosis (iron deposits in lungs) and is believed by some investigators to affect pulmonary functions. Primary route of entry is the respiratory system. Long term overexposure to iron fumes can cause deposits of iron in the lungs (siderosis). Lungs will clear in time when exposure to iron and its compounds cease. Overexposure to fluorides can cause serious bone erosion, excessive calcification of the bone and calcification of the ribs, pelvis, and spinal column. May cause skin rash. Long term overexposure to nickel compounds may cause lung fibrosis, edema or pneumoconiosis. May cause skin rash.

Numerical measures of toxicity

Chemical name	Inhalation LC50:	Dermal LD50:	Oral LD50:
Iron Oxide	-	-	> 10000 mg/kg (Rat)
Manganese	-	-	= 9 g/kg (Rat)
Chromium	-	-	-
Carbon	-	-	> 10000 mg/kg (Rat)
Copper	-	-	-
Sulfur	> 9.23 mg/L (Rat) 4 h	> 2000 mg/kg (Rabbit)	> 3000 mg/kg (Rat)
Silicon	-	-	= 3160 mg/kg (Rat)
Cobalt	> 10 mg/L (Rat) 1 h	-	= 6171 mg/kg (Rat)

Chemical name	Inhalation LC50:	Dermal LD50:	Oral LD50:
Arsenic	-	-	= 15 mg/kg (Rat) = 763 mg/kg (Rat)
Aluminum	-	-	-
Nickel	-	-	> 9000 mg/kg (Rat)
Vanadium pentoxide	= 4.29 mg/L (Rat) 4 h	= 50 mg/kg (Rabbit)	= 10 mg/kg (Rat)
Molybdenum	-	-	-
Phosphorus	= 4.3 mg/L (Rat) 1 h	= 100 mg/kg (Rat)	= 3030 µg/kg (Rat)
Zinc	-	-	= 630 mg/kg (Rat)
Tin	-	-	= 700 mg/kg (Rat)
Niobium	-	-	-
Lead	-	-	-
Boron Oxide	-	-	= 3150 mg/kg (Rat)
Titanium Dioxide	-	-	-
Nitrogen	-	-	-
Calcium Carbonate	-	-	-
Antimony	-	-	= 7 g/kg (Rat)

ATEmix (dermal) Not available

ATEmix (oral) Not available

ATEmix (inhalation-gas) Not available

ATEmix (inhalation-vapor) Not available

ATEmix (inhalation-dust/mist) Not available

Carcinogenicity

Chemical name	ACGIH OEL - Carcinogens	IARC	OSHA RTK Carcinogens	NTP
Iron Oxide	A4	Group 3	-	-
Manganese	A4	-	-	-
Chromium	A4	Group 3	-	-
Carbon	-	-	-	-
Copper	-	-	-	-
Sulfur	-	-	-	-
Silicon	-	-	-	-
Cobalt	A3	Group 2B	Listed	Reasonably Anticipated Carcinogen
Arsenic	A1	Group 1	Listed	Known Carcinogen
Aluminum	A4	-	-	-
Nickel	-	Group 1 Group 2B	Listed	Known Carcinogen Reasonably Anticipated Carcinogen
Vanadium pentoxide	A3	Group 2B	Listed	-
Molybdenum	-	-	-	-
Phosphorus	-	-	-	-
Zinc	-	-	-	-
Tin	-	-	-	-
Niobium	-	-	-	-
Lead	A3	Group 2A	Listed	Reasonably Anticipated Carcinogen

Chemical name	ACGIH OEL - Carcinogens	IARC	OSHA RTK Carcinogens	NTP
Boron Oxide	-	-	-	-
Titanium Dioxide	-	-	-	-
Nitrogen	-	-	-	-
Calcium Carbonate	-	-	-	-
Antimony	-	-	-	-

Canadian Province carcinogenicity limits

Chemical name	Alberta - Carcinogen	British Columbia - Carcinogen	Manitoba - Carcinogen	New Brunswick - Carcinogen	Nova Scotia - Carcinogen	Quebec - Carcinogen
Iron Oxide	-	-	ACGIH A4	ACGIH A4	ACGIH A4	-
Manganese	-	-	ACGIH A4	-	ACGIH A4	-
Chromium	-	-	ACGIH A4	ACGIH A4	ACGIH A4	-
Carbon	-	-	-	-	-	-
Copper	-	-	-	-	-	-
Sulfur	-	-	-	-	-	-
Silicon	-	-	-	-	-	-
Cobalt	-	IARC 2B	ACGIH A3	ACGIH A3	ACGIH A3	C3 carcinogen
Arsenic	A1 - Confirmed Human Carcinogen	ACGIH A1 ACGIH A1 IARC 1 IARC 1	ACGIH A1	ACGIH A1 ACGIH A1	ACGIH A1	-
Aluminum	-	-	ACGIH A4	-	ACGIH A4	-
Nickel	-	IARC 2B	ACGIH A5	-	ACGIH A5	-
Vanadium pentoxide	-	IARC 2B	ACGIH A3	ACGIH A4	ACGIH A3	-
Molybdenum	-	-	-	-	-	-
Phosphorus	-	-	-	-	-	-
Zinc	-	-	-	-	-	-
Tin	-	-	-	-	-	-
Niobium	-	-	-	-	-	-
Lead	-	IARC 2A IARC 2B	ACGIH A3	ACGIH A3	ACGIH A3	C3 carcinogen
Boron Oxide	-	-	-	-	-	-
Titanium Dioxide	-	-	-	-	-	-
Nitrogen	-	-	-	-	-	-
Calcium Carbonate	-	-	-	-	-	-
Antimony	-	-	-	-	-	-

12. ECOLOGICAL INFORMATION

Ecotoxicity

Chemical name	Algae/aquatic plants	Fish
Iron Oxide	-	-
Manganese	-	-
Chromium	-	-
Carbon	-	-
Copper	0.0426 - 0.0535: 72 h Pseudokirchneriella subcapitata mg/L EC50 static 0.031 - 0.054: 96 h Pseudokirchneriella subcapitata mg/L EC50 static	0.0068 - 0.0156: 96 h Pimephales promelas mg/L LC50 0.2: 96 h Pimephales promelas mg/L LC50 flow-through 0.3: 96 h Pimephales promelas mg/L LC50 static 1.25: 96 h Lepomis macrochirus mg/L LC50 static 0.052: 96 h Oncorhynchus mykiss mg/L

Chemical name	Algae/aquatic plants	Fish
		LC50 flow-through 0.112: 96 h <i>Poecilia reticulata</i> mg/L LC50 flow-through 0.8: 96 h <i>Cyprinus carpio</i> mg/L LC50 static 0.3: 96 h <i>Cyprinus carpio</i> mg/L LC50 semi-static
Sulfur	-	180: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 static 14: 96 h <i>Lepomis macrochirus</i> mg/L LC50 static 866: 96 h <i>Brachydanio rerio</i> mg/L LC50 static
Silicon	-	-
Cobalt	-	100: 96 h <i>Brachydanio rerio</i> mg/L LC50 static
Arsenic	-	-
Aluminum	-	-
Nickel	0.18: 72 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50 0.174 - 0.311: 96 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50 static	1.3: 96 h <i>Cyprinus carpio</i> mg/L LC50 semi-static 100: 96 h <i>Brachydanio rerio</i> mg/L LC50 10.4: 96 h <i>Cyprinus carpio</i> mg/L LC50 static
Vanadium pentoxide	-	-
Molybdenum	-	-
Phosphorus	-	0.015 - 0.032: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 static 100: 96 h <i>Brachydanio rerio</i> mg/L LC50 static 0.011 - 0.028: 96 h <i>Pimephales promelas</i> mg/L LC50 static 0.0017 - 0.0035: 96 h <i>Lepomis macrochirus</i> mg/L LC50 flow-through 0.001 - 0.004: 96 h <i>Lepomis macrochirus</i> mg/L LC50 static
Zinc	0.11 - 0.271: 96 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50 static 0.09 - 0.125: 72 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50 static	2.16 - 3.05: 96 h <i>Pimephales promelas</i> mg/L LC50 flow-through 0.45: 96 h <i>Cyprinus carpio</i> mg/L LC50 semi-static 2.66: 96 h <i>Pimephales promelas</i> mg/L LC50 static 3.5: 96 h <i>Lepomis macrochirus</i> mg/L LC50 static 7.8: 96 h <i>Cyprinus carpio</i> mg/L LC50 static 30: 96 h <i>Cyprinus carpio</i> mg/L LC50 0.211 - 0.269: 96 h <i>Pimephales promelas</i> mg/L LC50 semi-static 0.24: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 flow-through 0.59: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 semi-static 0.41: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 static
Tin	-	-
Niobium	-	-
Lead	-	0.44: 96 h <i>Cyprinus carpio</i> mg/L LC50 semi-static 1.32: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 static 1.17: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 flow-through
Boron Oxide	-	0.57: 72 h <i>Carassius auratus</i> g/L LC50 flow-through
Titanium Dioxide	-	-
Nitrogen	-	-
Calcium Carbonate	-	-
Antimony	-	-

Persistence and degradability Not available.

Bioaccumulation

Chemical name	CAS-No	Partition coefficient (log Kow)
Iron Oxide 1309-37-1	1309-37-1	-
Manganese 7439-96-5	7439-96-5	-
Chromium 7440-47-3	7440-47-3	-
Carbon	7440-44-0	-

Chemical name	CAS-No	Partition coefficient (log Kow)
7440-44-0		
Copper 7440-50-8	7440-50-8	-
Sulfur 7704-34-9	7704-34-9	-
Silicon 7440-21-3	7440-21-3	-
Cobalt 7440-48-4	7440-48-4	-
Arsenic 7440-38-2	7440-38-2	-
Aluminum 7429-90-5	7429-90-5	-
Nickel 7440-02-0	7440-02-0	-
Vanadium pentoxide 1314-62-1	1314-62-1	-
Molybdenum 7439-98-7	7439-98-7	-
Phosphorus 7723-14-0	7723-14-0	-
Zinc 7440-66-6	7440-66-6	-
Tin 7440-31-5	7440-31-5	-
Niobium 7440-03-1	7440-03-1	-
Lead 7439-92-1	7439-92-1	-
Boron Oxide 1303-86-2	1303-86-2	-
Titanium Dioxide 13463-67-4	13463-67-4	-
Nitrogen 7727-37-9	7727-37-9	-
Calcium Carbonate 1317-65-3	1317-65-3	-
Antimony 7440-36-0	7440-36-0	-

Mobility in soil

Not available.

Other adverse effects

Welding consumables and materials can degrade into the components used to manufacture the product. Avoid exposure to conditions that could lead to accumulation in soils and groundwater.

13. DISPOSAL CONSIDERATIONS

Disposal information

Dispose of any grinding dust and waste residues in accordance with EPA or local regulations. Plastic materials, cardboard, and wire can be recycled. Do not flush residue into waterways.

Contaminated packaging

Empty containers should be taken for local recycling, recovery or waste disposal.

14. TRANSPORTATION INFORMATION

Shipping Descriptions

DOT

Proper shipping name Not regulated

TDG

Proper shipping name Not regulated

IATA

Proper shipping name Not regulated

IMDG/IMO

Proper shipping name Not regulated

Marine Pollutants

Chemical name	CAS-No	USDOT Marine Pollutant	Canada TDG Marine Pollutant	IMDG Marine Pollutant
Iron Oxide	1309-37-1	-	-	-
Manganese	7439-96-5	-	-	-
Chromium	7440-47-3	-	-	-
Carbon	7440-44-0	-	-	-
Copper	7440-50-8	X	-	X
Sulfur	7704-34-9	-	-	-
Silicon	7440-21-3	-	-	-
Cobalt	7440-48-4	-	-	-
Arsenic	7440-38-2	-	-	-
Aluminum	7429-90-5	-	-	-
Nickel	7440-02-0	-	-	-
Vanadium pentoxide	1314-62-1	-	-	-
Molybdenum	7439-98-7	-	-	-
Phosphorus	7723-14-0	-	-	-
Zinc	7440-66-6	-	-	-
Tin	7440-31-5	-	-	-
Niobium	7440-03-1	-	-	-
Lead	7439-92-1	-	-	-
Boron Oxide	1303-86-2	-	-	-
Titanium Dioxide	13463-67-4	-	-	-
Nitrogen	7727-37-9	-	-	-
Calcium Carbonate	1317-65-3	-	-	-
Antimony	7440-36-0	-	-	-

Special Precautions

Multi-modal shipping descriptions are provided for informational purposes and do not consider container size. The presence of a shipping description for a particular mode of transport (sea, air, etc.), does not indicate that the product is packaged suitably for that mode of transport. All packaging must be reviewed for suitability prior to shipment, and compliance with the applicable regulations is the sole responsibility of the person offering the product for transport. People loading and unloading dangerous goods must be trained on all of the risks deriving from the substances and on all actions in case of emergency situations.

15. REGULATORY INFORMATION**State regulations**

U.S. state Right-to-Know regulations

Chemical name	CAS-No	Massachusetts - RTK	New Jersey - RTK	Pennsylvania - RTK
Iron Oxide	1309-37-1	X	X	X
Manganese	7439-96-5	X	X	X
Chromium	7440-47-3	X	X	X
Carbon	7440-44-0	-	-	-
Copper	7440-50-8	X	X	X
Sulfur	7704-34-9	X	X	X
Silicon	7440-21-3	X	X	X
Cobalt	7440-48-4	X	X	X
Arsenic	7440-38-2	X	X	X
Aluminum	7429-90-5	X	X	X
Nickel	7440-02-0	X	X	X
Vanadium pentoxide	1314-62-1	X	X	X
Molybdenum	7439-98-7	X	X	X
Phosphorus	7723-14-0	X	X	X
Zinc	7440-66-6	X	X	X
Tin	7440-31-5	X	X	X
Niobium	7440-03-1	-	-	-
Lead	7439-92-1	X	X	X
Boron Oxide	1303-86-2	X	X	X
Titanium Dioxide	13463-67-4	-	-	-
Nitrogen	7727-37-9	X	X	X
Calcium Carbonate	1317-65-3	X	X	X
Antimony	7440-36-0	X	X	X

California Prop. 65

WARNING: This product contains a chemical(s) known to the state of California to cause cancer, birth defects or other reproductive harm

Chemical name	CAS-No	California Prop. 65
Iron Oxide	1309-37-1	-
Manganese	7439-96-5	-
Chromium	7440-47-3	Carcinogen, Birth defects, reproductive harm
Carbon	7440-44-0	-
Copper	7440-50-8	-
Sulfur	7704-34-9	-
Silicon	7440-21-3	-
Cobalt	7440-48-4	Carcinogen
Arsenic	7440-38-2	Carcinogen
Aluminum	7429-90-5	-
Nickel	7440-02-0	Carcinogen
Vanadium pentoxide	1314-62-1	Carcinogen
Molybdenum	7439-98-7	-
Phosphorus	7723-14-0	-
Zinc	7440-66-6	-
Tin	7440-31-5	-
Niobium	7440-03-1	-
Lead	7439-92-1	Carcinogen Developmental Female Reproductive Male Reproductive
Boron Oxide	1303-86-2	-
Titanium Dioxide	13463-67-4	-
Nitrogen	7727-37-9	-
Calcium Carbonate	1317-65-3	-
Antimony	7440-36-0	-

California Proposition 65

Warning: This product contains or produces a chemical known to the State of California to cause birth defects (or other reproductive harm) and cancer

U.S. Federal Regulations**RCRA - D Series Wastes**

Some unused product may contain chromium which is considered hazardous waste if discarded, RCRA ID characteristic Toxic Hazardous Waste D007. Other ingredients in this product may be considered "hazardous material" in other countries and they may require special disposal methods. Contact your local municipality for the proper disposal method. Residues from welding consumables and processes could degrade and accumulate in groundwater. Welding slag from these products could typically contain the following components from the coating of the electrode: Ni, Fe, Cr, Mn, F, Na, Si, and Ca

US EPA SARA 313

Chemical name	CAS-No	CERCLA/SARA Hazardous Substances RQ	SARA 313 - Threshold Values
Iron Oxide	1309-37-1	-	-
Manganese	7439-96-5	-	1.0 %
Chromium	7440-47-3	5000 lb 2270 kg 10 lb 4.54 kg	1.0 %
Carbon	7440-44-0	-	-
Copper	7440-50-8	5000 lb 2270 kg	1.0 %
Sulfur	7704-34-9	-	-
Silicon	7440-21-3	-	-
Cobalt	7440-48-4	-	0.1 %
Arsenic	7440-38-2	1 lb 0.454 kg	0.1 %
Aluminum	7429-90-5	-	1.0 %
Nickel	7440-02-0	100 lb 45.4 kg	0.1 %
Vanadium pentoxide	1314-62-1	1000 lb 454 kg	1.0 %
Molybdenum	7439-98-7	-	-
Phosphorus	7723-14-0	1 lb 0.454 kg	1.0 %
Zinc	7440-66-6	454 kg 1000 lb	1.0 %
Tin	7440-31-5	-	-
Niobium	7440-03-1	-	-
Lead	7439-92-1	10 lb 4.54 kg	0.1 %
Boron Oxide	1303-86-2	-	-
Titanium Dioxide	13463-67-4	-	-
Nitrogen	7727-37-9	-	-
Calcium Carbonate	1317-65-3	-	-
Antimony	7440-36-0	5000 lb 2270 kg 10 lb 4.54 kg	1.0 %

**US EPA SARA 311/312
hazardous categorization**

Not available

Chemical name	DSL/NDSL	Inventory - United States - Section 8(b) Inventory (TSCA)	U.S. - TSCA (Toxic Substances Control Act) - Section 12(b) - Export Notification
Iron Oxide	X	X	-
Manganese	X	X	-
Chromium	X	X	-
Carbon	X	X	-
Copper	X	X	-
Sulfur	X	X	-
Silicon	X	X	-
Cobalt	X	X	-
Arsenic	X	X	-
Aluminum	X	X	-
Nickel	X	X	-
Vanadium pentoxide	X	X	-
Molybdenum	X	X	-
Phosphorus	X	X	-
Zinc	X	X	-
Tin	X	X	-
Niobium	X	X	-
Lead	X	X	-
Boron Oxide	X	X	-
Titanium Dioxide	-	-	-
Nitrogen	X	X	-
Calcium Carbonate	X	X	-
Antimony	X	X	-

Legend X - Listed

16. OTHER INFORMATION

NFPA

Health	2
Flammability	0
Instability	0

HMIS

Health	2
Flammability	0
Physical hazards	0

Notice: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA).

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Revision note

Key to abbreviations

ACGIH (American Conference of Governmental Industrial Hygienists)

ATE (Average Toxicity Estimate)
DSL/NDSL (Domestic Substance List/Non-Domestic Substance List)
HMIS (Hazardous Materials Identification System)
IARC (International Agency for Research on Cancer)
IATA (International Air Transport Association)
IMDG/IMO (International Maritime Dangerous Goods/International Maritime Organization)
NFPA (National Fire Protection Association)
NTP (National Toxicology Program)
OEL (Occupational Exposure Level)
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
PEL (Permissible Exposure Limit)
TSCA (Toxic Substance Control Act)
USEPA (United States Environmental Protection Agency)

Disclaimer

The information accumulated herein is believed to be accurate, but is not warranted to be, whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

End of Safety Data Sheet