



SAFETY DATA SHEET (SDS)

For U.S. Manufactured or Distributed Welding Consumables and Related Products. Designed to meet the Globally Harmonized System (GHS) of Classification and Labeling of Chemicals. May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200 and Superfund Amendments and reauthorization Act (SARA) of 1986 Public Law 99-499. The OSHA standard must be consulted for specific requirements. This Safety Data Sheet complies with European Commission Directive 89/106/EEC, ISO 11014-1 and ANSI Z400.1.

Date: 09/01/2015 SDS No. 1001

SECTION 1: Identification of the substance or mixture and of the supplier

Supplier details:	Victory Welding Alloys, Inc. 2981 Interstate St. Charlotte, NC 28208
Telephone Number:	704-523-8798
Email Address:	sales@victoryweldingalloys.com
Emergency Number:	704-523-8798
Product Identifier:	Stainless Steel Solid Welding Wires
Intended use of this product:	For use as Welding Consumables
AWS SPECIFICATION: AWS A5.9 CLASSIFICATIONS: ER307, ER308, ER308H, ER308L, ER308LSI, ER309, (ER309H), ER309L, ER309LSI, ER309LMo, ER310, ER312, ER316, ER316H, ER316L, ER316LSI, 317L, ER320, ER320LR, ER321, ER330, ER347, ER347H, ER385 (904L), ER409Nb, ER410, ER410NiMo, ER420, ER430, ER630(17-4PH), ER16-8-2, ER2209, ER2553, ER2507, ER2594, SUPER TENSILE BLUE TIG	

SECTION 2: Hazard identification

CLP/GHS CLASSIFICATION (1272/2008) OF THE SUBSTANCE OR MIXTURE

Acute Tox. 4 (Oral): Acute Toxicity Category 4 (Oral) (H302)

Skin Sens. 1: Skin Sensitization Category 1 (H317)

Carc. 1B: Carcinogenicity Category 1B (H350)

STOT RE 1: Specific Target Organ Toxicity – Repeat Exposure Category 1 (H372)

STOT RE 2: Specific Target Organ Toxicity – Repeat Exposure Category 2 (H373)

LABEL ELEMENTS

DANGER!



APPLICABLE HAZARD PHRASES

H302: Harmful if swallowed.

H317: May cause an allergic skin reaction

H350: May cause cancer

H372: Causes damage to respiratory system through prolonged or repeated exposure

H373: May cause damage to brain and nervous system through prolonged or repeated exposure

See Section 16 for additional H-Phrase texts

PRECAUTIONARY PHRASES

P201: Obtain special instructions before use

P202: Do not handle until all safety precautions have been read and understood

P260: Do not breathe dust/fume/gas/mist/vapors/spray

P261: Avoid breathing dust/fume/gas/mist/vapors/spray

P264: Wash hands thoroughly after handling

P270: Do not eat, drink or smoke when using this product

P272: Contaminated work clothing should not be allowed out of the workplace

P280: Wear protective gloves/protective clothing/eye protection/face protection

P302 + P352: IF ON SKIN: Wash with plenty of soap and water

P308 + P313: IF exposed or concerned: Get medical attention

P333 + P313: If skin irritation or rash occurs: Get medical attention

P362 + P364: Take off contaminated clothing and wash it before reuse

P501: Dispose of contents in accordance with local, regional, national and international regulations

OTHER HAZARDS: No additional information available.

SECTION 3: Composition/information on ingredients

HAZARDOUS INGREDIENT	CAS NUMBER	EINCSr	Weight Pct.	EU Classification - 67/548/EEC ^A (Risk Phrase Texts – see section 16)	GHS-US Classification (H-Phrase texts – sec. 16)	IARC ^E	NTP ^Z	OSHA ^H	65°
CHROMIUM (Cr)	7440-47-3	231-157-5	10.5-35	0 – R9; Carc 1 ^Φ – R45; Muta 2 –	Not Classified	1 ^{ΣΣ} , 3 ^Σ	K ^{ΣΣ}	X ^{ΣΣ}	X ^{ΣΣ}

				R46; Repr 3 – R62; T+ -R26; T – R24/25, R48/23; C – R35, R42/43; N – R50, R53 ^{ΣΣΣ}					
IRON (Fe)	7439-89-6	231-096-4	40-80	None	Acute Tox. 4 (Oral), H302	---	---	---	---
MANGANESE (Mn)	7439-96-5	231-105-1	0-13.5	Xn – R20/22 ^Y	STOT RE 2, H373	---	---	---	---
MOLYBDENUM (Mo)	7439-98-7	231-107-2	0-5.2	Xn – R48/20/22; Xi – R36/37 ^X	Not Classified	---	---	---	---
NICKEL (Ni)	7440-02-0	231-111-4	0-37	Carc 3 ^Φ R40; T – R43, R48/23	Skin Sens. 1, H317 Carc. 1B, H350 STOT RE 1, H372	1	K	X	X
SILICON (Si)	7440-21-3	231-130-8	0-4.5	None	Not Classified	---	---	---	---
NIOBIUM (Nb)	7440-03-1	231-113-5	0.05-1	None	Not Classified	---	---	---	---
COPPER (Cu)	7440-50-8	231-159-6	0-4	None	Not Classified	---	---	---	---
Amorphous Silica Fume	69012-64-2	273-761-5	Fume	None	Not Classified	3	K	---	X
Hexavalent Chromium (fume constituent)	1333-82-0	215-607-8	Fume	Carc. 1; Muta. 2; Repr. 3; T+, C, N R24/25, R26, R35, R42/43, R45, R46, R48/23 R62, R50/53	Acute Tox 3 (H301); Acute Tox. 2 (H310, H330); Skin Corr 1A (H314); Resp Sens 1 (H334); Skin Sens 1 (H317); Repr 2 (H360); Muta 1B (H340); Carc 1A (H350); STOT RE 1 (H372); Aquatic Acute 1 (H400); Aquatic Chronic 1 (H410)	1 ^{ΣΣ}	K ^{ΣΣ}	X ^{ΣΣ}	X ^{ΣΣ}

Γ-European Inventory of Existing Chemical Substances Number Δ-European Union Directive 67/548/EEC-Annex 1 E-International Agency for Research on Cancer (1-Human Carcinogen, 2A-Probably Carcinogenic to Humans, 2B- Possible Carcinogenic to Humans, 3-Unclassifiable as to Carcinogenicity in Humans, 4 Probably Not Carcinogenic to Humans) Z-US National Toxicology Program (K-Known Carcinogen, S-Suspected Carcinogen) H-OSHA Known Carcinogen List e-California Proposition 65 (X-On Proposition 65 list) ---Dashes indicate the ingredient is not with the IARC, NTP, OSHA or 65 Φ-Carcinogen, Mutagen or Reproductive Category per European Council Directive 67/548/EEC Annex 1 Σ-Metal and Chromium III Compounds ΣΣ-Chromium VI Compounds ΣΣΣ –Chromium (VI) Trioxide EU 67/548/EEC Classification/Designation Y -Manganese Dioxide EU 67/548/EEC Classification/Designation X-Molybdenum Trioxide EU 67/548/EEC Classification/Designation

The following symbols correspond with the EU 67/548/EEC column above are in European Union Directive 67/548/EEC Annex 1 and EC 1272/2008 Annex VI - Table 3.2:



Xn: Harmful



Xi: Irritant



O: Oxidizer



C: Corrosive



N: Dangerous for the Environment



T: Toxic



T+: Extremely Toxic

WARNING! – Avoid breathing welding fumes and gases; they may be dangerous to your health. Always use adequate ventilation. Always use appropriate personal protective equipment

PRIMARY ROUTES OF ENTRY: Respiratory System, Eyes and/or Skin **ARC RAYS:** The welding arc can injure eyes and burn skin.

ELECTRIC SHOCK: Arc welding and associated processes can kill. See Section 8.

FUMES AND GASES: Can be dangerous to your health.

Welding fumes and gases cannot be classified simply. The composition and quantity of fumes and gases are dependent upon the metal being welded, the process, the procedures followed and the consumables used. Most fume ingredients are present as complex oxides and compounds and not as pure metals. Workers should be aware that the composition and quantity of the fumes and gases they are exposed to are influenced by coatings such as paint, plating or galvanizing which may be present on the metal being welded, the number of welders in operation relative to the volume of the work area, the quality and effectiveness of the ventilation, the position of the welders 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 procedures).

Fumes may affect eyes, skin, respiratory system as well as the pancreas and liver. When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. The composition of these fumes and gases are the concerning matter and not the composition of the consumable itself. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation of the materials shown in this section, plus those from the base metal coating, etc., as noted above.

Reasonable expected constituents of the fume would include complex oxides or compounds of amorphous silica fume, chromium, manganese and nickel as well as complex oxides of iron, silicon, copper, molybdenum and niobium. Fume limit for chromium, nickel and/or manganese may be reached before limit of 5 mg/m³ of general welding fumes is reached. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. One recommended way to determine the composition and quantity of fumes and gases to which workers are



exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1, available from the American Welding Society, P.O. Box 351040, Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment-A Sampling Strategy Guide" which gives additional advice on sampling.

SECTION 4: First aid measures

Description of First Aid Measures:

Physical contact with unused welding consumables covered under this SDS poses no health hazard. The following first aid procedures pertain to used welding consumables and the fumes/gases generated.

Inhalation: Breathing difficulty caused by inhalation of dust or fume requires removal to fresh air. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.

Ingestion: Unlikely entry due to the form of the product, however ingestion of particulate is possible through food, drinks, smoking, etc. Do not give anything by mouth to an unconscious person. Contact a poison control center. Unless the poison control center advises otherwise, have the conscious person slowly drink 1 to 2 glasses of water to dilute. Do not induce vomiting. Obtain medical assistance immediately.

Skin: Quickly remove contaminated clothing. Do not shake clothing. Skin contamination with dust or fume can be removed by washing with soap and water. For reddened or blistered skin, consult a physician.

Eyes: Do not allow the victim to rub or keep eyes tightly shut. Dust or fume should be flushed from the eyes with copious amounts of clean water, then go to an emergency medical facility and consult a physician.

Section 11 of this SDS covers the acute effects of overexposure to the various ingredients within the welding consumable. Section 8 of this SDS lists the exposure limits and covers methods for protecting yourself and your co-workers.

Most important symptoms and effects, both acute and delayed

Inhalation: Short term (acute) Inhalation of welding fumes may cause discomfort such as dizziness, nausea, or dryness or irritation of nose, throat or eyes. Pre-existing respiratory problems such as asthma and emphysema may be aggravated. Arc rays may injure eyes and burn skin. Long term (prolonged or repeated) overexposure to welding fumes causes damage to the respiratory system and may cause brain or nervous system damage.

Prolonged and repeated exposure to welding fumes may cause siderosis (iron deposits in lungs), liver or kidney damage, skin and respiratory sensitization (allergic reaction) and affect pulmonary function. Hexavalent chromium compounds and nickel compounds are listed in the NTP (National Toxicology Program) Annual Report on Carcinogens, found to be a human carcinogen in the IARC (International Agency for Research on Cancer Monographs, or listed by OSHA/ACGIH as potential carcinogens.

Ingestion: Not an expected route of exposure during normal use of this product. May be harmful if ingested.

Skin: Dust and fumes may cause irritation of the skin.

Eyes: Dust and fumes may cause eye irritation.

SECTION 5: Fire-fighting measures

Welding consumables applicable to this SDS, as shipped are nonreactive, nonflammable, non-explosive and essentially nonhazardous until welded. Welding arcs and sparks can ignite combustibles and can initiate fires and explosions. Used welding consumables may remain hot for a period of time after completion of welding process. Read and understand American National Standard Institute (ANSI) Z49.1 "Safety in Welding and Cutting" and National Fire Protection Association standard 51B for fire prevention in "Cutting and Welding Processes" before using these products.

Extinguishing Media: N/A Flammable Limit: N/A Flash Point: N/A Unusual Fire and Explosive Hazards: N/A Special Fire Fighting Procedures: Firefighters should wear full protective gear.

SECTION 6: Accidental release measures

In solid form the welding consumables applicable to this SDS pose no special clean-up procedures. Wear proper personnel protective equipment, pick up the unused welding consumables and return to original container.

Avoid release into the environment. If the material is in the form of powder or dust, notify safety personnel, isolate the area and deny entry. Do not sweep, but use a vacuum system utilizing a high efficiency particulate air (HEPA) filtration system. Use caution to minimize airborne generation of the powder or dust and avoid contamination of air and water. Cleanup personnel should wear proper protective equipment to avoid exposure.

Properly label all powder or dust collected in a waste container and dispose of in an environmentally acceptable manner.

SECTION 7: Handling and storage

HANDLING: Store in a dry area to protect product quality. No other specific requirements in the form supplied. Wear gloves and do not ingest dust from welding consumables. Some individuals can develop an allergic reaction to certain materials. Avoid inhalation of welding fumes. Keep your head out of the fumes. Use enough ventilation or exhaust at the arc, or both, to keep fumes and gases below the occupational exposure limits in your breathing zone and general work area. Work in a confined space only if it is well ventilated or while wearing an air-supplied respirator. Fumes from welding combined with oxygen depletion can alter the air quality causing injury or death.

Read and understand the manufacturer's instructions and precautionary label on the product packaging as well as your employer's safety practices. Take all necessary precautions to protect yourself and others. **See Section 16 for further handling and storage information.**

SECTION 8: Exposure controls/personal protection



Read and understand the instructions and the labels on the packaging. Welding fumes do not have a specific OSHA PEL or ACGIH TLV. The OSHA PEL for Particulate – Not Otherwise Classified (PNOC) is 5 mg/m³ – Respirable Fraction, 15 mg/m³ – Total Dust. The ACGIH TLV for Particles – Not Otherwise Specified (PNOS) is 3 mg/m³ – Respirable Particles, 10 mg/m³ – Inhalable Particles. The individual complex compounds within the fume may have a lower OSHA PEL or ACGIH TLV than the OSHA Particulate – Not Otherwise Classified (PNOC) and ACGIH Particles – Not Otherwise Specified (PNOS). An Industrial Hygienist, the OSHA Permissible Exposure Limits for Air Contaminants (29 CFR 1910.1000), and the ACGIH Threshold Limit Values should be consulted to determine the specific fume constituents present and their respective exposure limits. European Union Occupational Exposure Limits (EU OEL) are listed with the most stringent limit among the EU member nations. All exposure limits are in milligrams per cubic meter (mg/m³).

INGREDIENT	CAS NUMBER	EINCS	OSHA PEL	ACGIH TLV	EU OEL
CHROMIUM (Cr)#	7440-47-3	231-157-5	1 (Metal) 0.5 (Cr II & Cr III CpnDs) 0.005 (Cr VI CpnDs)	0.5 (Metal) {A4} 0.5 (Cr III CpnDs) {A4} 0.05 (Cr VI Sol CpnDs) {A1} 0.01 (Cr VI Insol CpnDs) {A1}	0.1 I* (Aerosol) –Switzerland 0.005; 0.01*** - Denmark 0.005 (Total Aerosol); 0.015*** (Total Aerosol) - Sweden
IRON (Fe)+	7439-89-6	231-096-4	5 R*	5 R* (Fe ₂ O ₃) {A4}	3 R* (Aerosol as Fe ₂ O ₃) – Switzerland 7*** (as Fe ₂ O ₃) - Denmark
MANGANESE (Mn)#	7439-96-5	231-105-1	5 CL ** (Fume) 1, 3 STEL***■	0.1I* {A4} 0.02 R*	0.02 R* (Aerosol); 0.16 R*** (Aerosol) – Germany 0.2 I* (Aerosol) – Germany 0.2; 0.4*** - Denmark
MOLYBDENUM (Mo)	7439-98-7	231-107-2	5 R*	3 R*; 10 I* (Ele and Insol) 0.5 R* (Sol CpnDs) {A3}	3 R* - Spain; 4; 10*** - Poland
NICKEL (Ni)#	7440-02-0	231-111-4	1 (Metal) 1 (Sol CpnDs) 1 (Insol CpnDs)	1.5I* (Ele) {A5} 1.1I* (Sol CpnDs) {A4} 1.2I* (Insol CpnDs) {A1}	0.05; 0.1*** - Denmark
SILICON (Si)+	7440-21-3	231-130-8	5 R*	3 R*	4 R* (Aerosol); 10 I* (Aerosol) - Denmark
NIOBIUM (Nb)	7440-03-1	231-113-5	5 R*	3 R*	0.5; 1*** - Denmark
COPPER (Cu)	7440-50-8	231-159-6	0.1 (Fume), 1 (Dust)	0.2 (Fume) 1 (Dust)	0.1 I* (Aerosol); 0.2 I* (Aerosol) – Germany 0.1; 0.2*** - Denmark
(Amorphous Silica Fume)	69012-64-2	273-761-5	0.8	3 R*	2 I*; 4 I*** - Denmark
Hexavalent Chromium (fume constituent)	1333-82-0	215-607-8	0.05	0.01 (insoluble compounds) 0.05 (water soluble compounds)	0.05** – U.K. OEL 0.05** – France

R*-Respirable Fraction R***-Respirable Fraction-Short Term Exposure Limit I*-Inhalable Fraction I***-Inhalable Fraction-Short Term Exposure Limit **-Ceiling Limit ***-Short Term Exposure Limit +-As a nuisance particulate covered under “Particulates Not Otherwise Regulated” by OSHA or “Particulates Not Otherwise Classified” by ACGIH +-Crystalline silica is bound within the product as it exists in the package. However, research indicates silica is present in welding fume in the amorphous (non-crystalline) form #-Reportable material under Section 313 of SARA ## -Reportable material under Section 313 of SARA only in fibrous form ■-NIOSH REL TWA (Time Weighted Average) and STEL (Short Term Exposure Limit) Ele-Element Sol-Soluble Insol-Insoluble Inorg-Inorganic CpnDs- Compounds NOS-Not Otherwise Specified {A1}-Confirmed Human Carcinogen per ACGIH {A2}-Suspected Human Carcinogen per ACGIH {A3}-Confirmed Animal Carcinogen with Unknown Relevance to Humans per ACGIH {A4}-Not Classifiable as a Human Carcinogen per ACGIH {A5}-Not Suspected as a Human Carcinogen per ACGIH (non-crystalline) form. See Section 16 for more definitions.

VENTILATION: Use plenty of ventilation and/or local exhaust at the arc to keep the fumes and gases below the threshold limits (PEL/TLV/OEL) within the worker’s breathing zone and the general area. Welders should be advised to keep their head out of the fume plume. If fumes are removed by filtration or some other means and the air/gas is put back into the room, gases and fumes may build up to toxic or asphyxiation levels. Gas build-up should be monitored and if excessive should be removed or reduced to safe levels by some supplementary system and/or reduced by general ventilation.

RESPIRATORY PROTECTION: Use NIOSH approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below the threshold limits. Remember that the shielding gases used in the GMAW and GTAW processes can displace breathing air and cause asphyxiation in confined work spaces or unventilated areas.

SKIN PROTECTION: Wear approved head, hand and body protection which help prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. This includes welder’s gloves and protective face shield, and may include arm protectors, aprons, hats, shoulder protection as well as dark non synthetic clothing. Do not wear short sleeve shirts or short pants. Welders should be trained not to allow electrically live parts to contact the skin, wet clothing or wet gloves. Welders should insulate themselves from the work and ground.

EYE PROTECTION: Wear a helmet or face shield with filter lens shade number 12-14 or darker. Do not go below the minimum recommended shade in ANSI Z49.1. Shield other workers by providing screens and flash goggles.

ELECTRIC SHOCK: Welders should be trained to avoid electric shock by maintaining a dry work area, insulating themselves from the work piece and ground. Do not touch live electrical parts.

SPECIAL PRECAUTIONS (IMPORTANT): Maintain exposure below the PEL/TLV/OEL threshold limits. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV/OEL. Always use exhaust ventilation. Refer to the following sources for important additional information: American National Standard (ANSI) Z49.1, “Safety in Welding and Cutting,” published by the American Welding Society, PO Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29 CFR 1910), U.S. Government Printing Office, Washington, DC 20402.

SECTION 9: Physical and chemical properties



Welding consumables applicable to this SDS as shipped are nonreactive, nonflammable, non-explosive, and essentially nonhazardous until welded.

Appearance: Solid metal wire or rods

Odor: Odorless

Odor Threshold: Not applicable

pH: Not applicable

Melting Point/Freezing point: Not applicable

Initial boiling point and boiling range: Not applicable

Flash Point: Not flammable

Evaporation rate: Not applicable

Flammability: Not applicable

No other information available

Upper/lower flammability or explosive limits: Not applicable

Vapor pressure: Not applicable

Vapor density: Not applicable

Relative density: Not applicable

Solubility: Insoluble in water

Partition coefficient: n-octanol/water: Not applicable

Auto-ignition temperature: Not applicable

Decomposition temperature: Not applicable

Viscosity: Not applicable

SECTION 10: Stability and reactivity

Reactivity: Not reactive under normal conditions however contact with acids or cleaning and degreasing chemicals may cause generation of gas

Chemical Stability: Stable under normal conditions.

Possibility of hazardous reactions: None known

Conditions to avoid: None known

Incompatible materials: None known

Hazardous decomposition products: Welding fumes and gases cannot be classified simply. The composition and quantity of fumes and gases are dependent upon the metal being welded, the process, the procedures followed and the consumables used. Most fume ingredients are present as complex oxides and compounds and not as pure metals. Workers should be aware that the composition and quantity of the fumes and gases they are exposed to are influenced by coatings such as paint, plating or galvanizing which may be present on the metal being welded, the number of welders in operation relative to the volume of the work area, the quality and effectiveness of the ventilation, the position of the welders 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 procedures). Fumes may affect eyes, skin, respiratory system as well as the pancreas and liver. When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. The composition of these fumes and gases are the concerning matter and not the composition of the consumable itself. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation of the materials shown in this section, plus those from the base metal coating, etc., as noted above.

Reasonable expected constituents of the fume would include complex oxides or compounds of amorphous silica fume, chromium, manganese and nickel as well as complex oxides of iron, silicon, copper, molybdenum and niobium. Fume limit for chromium, nickel and/or manganese may be reached before limit of 5 mg/m³ of general welding fumes is reached. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1, available from the American Welding Society, P.O. Box 351040, Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment-A Sampling Strategy Guide" which gives additional advice on sampling.

SECTION 11: Toxicological information

SHORT-TERM (ACUTE) OVEREXPOSURE EFFECTS: Target Organs for fumes: skin, eyes, respiratory system: Welding Fumes – Inhalation of welding fumes can be dangerous to your health. Short-Term (Acute) overexposure to welding fumes may result in discomfort such as dizziness, nausea or dryness or irritation of the nose, throat or eyes. **Hexavalent Chromium (VI)** compounds present in the fume may cause abdominal pain, diarrhea, muscular weakness and convulsions. Continued inhalation could cause loss of consciousness and death. **Hexavalent Chromium (VI)** compounds may cause severe irritation of the bronchial tubes and lungs. Ingesting **Hexavalent Chromium (VI)** salts can cause severe injury or death. **Hexavalent Chromium (VI)** compounds may burn eyes. Dust on skin can form ulcers. Allergic reactions may occur in some people. **Iron, iron oxide** fumes – no effects are known but treat as nuisance dust or fume. **Manganese** may cause metal fume fever characterized by chills, fever, upset stomach, vomiting, and irritation of the throat and aching of the body. Recovery is generally complete within 48 hours of overexposure. **Silica (amorphous silica fume)** dust and fumes may cause irritation of the respiratory system, skin and eyes. **Molybdenum** may cause irritation of the eyes, nose, and throat. **Nickel and nickel oxides** may cause metal fume fever identified by a metallic taste in mouth, tightness around the chest and allergic reactions. **Copper** present in the fumes may cause metal fume fever identified by metallic taste in mouth, tightness of chest and fever that may last 24 to 48 hours following overexposure.

LONG-TERM (CHRONIC) OVEREXPOSURE EFFECTS: Target organs for fumes: skin, respiratory system, kidneys, liver, and central nervous system including brain. Welding Fumes – Excessive levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis" (iron deposits in the lung). OSHA (29 CFR 1910.1200) lists **Chromium** and **Nickel** as possible carcinogens. The IARC (International Agency for Research of Cancer) lists chromium and nickel as posing carcinogenic risks to humans. Constant and repetitive inhalation of chromium may cause an ulceration and perforation of the nasal septum as well as liver and kidney damage. Respiratory irritation may occur with symptoms resembling asthma. Studies have shown that chromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. **Hexavalent Chromium (VI)** compounds are more readily absorbed through the skin than chromium (III) compounds. Good practice requires the reduction of employee exposure to chromium (III) and (VI) compounds. **Iron, iron oxide** fumes may cause siderosis (iron deposits in the lung) which some researchers believe may affect pulmonary function. The lungs will clear in time when exposure to iron and its compounds ceases. Long-term overexposure to **manganese** and **manganese compounds** may affect the central nervous system, including the brain. Symptoms may include slurred speech or resemble Parkinson's disease and can include a spastic gait, muscle spasms, tremors, cramps, behavioral changes and constant sleepiness. Employees who are overexposed to manganese compounds should be sent to a physician for early detection to avoid progressive and permanent damage. Long-term overexposure to **molybdenum** may result in loss of appetite, weight loss, loss of muscle coordination, difficulty in



breathing and anemia. Long-term overexposure to **nickel** or **nickel compounds** may cause lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers. **Copper** poisoning is possible from excessive exposure to high levels of copper fume resulting in damage to the liver caused by cell destruction and cirrhosis. Anemia, jaundice and damage to the central nervous system may also occur. Long-term overexposure to **silica (amorphous silica)** may cause pneumoconiosis. Non-crystalline forms of silica (amorphous silica) are considered to have little fibrotic potential.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with pre-existing impaired lung functions (asthma-like conditions). Persons with a pacemaker should not go near welding and cutting operations until they have consulted their doctor and obtained information from the manufacturer of the device. Respirators are to be worn only after being medically cleared by your company-designated physician.

EMERGENCY AND FIRST AID PROCEDURES: Call for medical aid techniques recommended by the American Red Cross. If irritation or flash burns develop after exposure, consult a physician.

CARCINOGENICITY: Hexavalent Chromium VI compounds, nickel compounds, and silica (crystalline quartz) are classified as IARC Group 1 and NTP Group K carcinogens. Hexavalent Chromium VI compounds, nickel compounds, silica (crystalline quartz) and welding fumes must be considered as carcinogens under OSHA (29 CFR 1910.1200).

CALIFORNIA PROPOSITION 65: WARNING: The products covered by this SDS contain chromium and nickel. When the product is used in normal processes, fumes and gases will be generated such as hexavalent chromium compounds and nickel compounds which are known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code Section 25249.5 et seq.).

Mercury Statement: Mercury is not a normal contaminant in Solid Stainless Steel welding wires and neither it nor any of its compounds are used in the manufacture of these products.

TOXICITY DATA

Acute toxicity: No acute toxicity data available for these products.

INGREDIENT	CAS NUMBER	EINCS	ENTRY METHOD/TOXICITY VALUES
CHROMIUM (Cr)	7440-47-3	231-157-5	• Ingestion: rat LD50 >5000 mg/kg • Ingestion: human LDLo : 71 mg/kg • Inhalation: rat LC50 >5.41 mg/L
IRON (Fe)	7439-89-6	231-096-4	• Ingestion: rat LD50 98.6 g/kg
MANGANESE (Mn)	7439-96-5	231-105-1	• Ingestion: rat LD50 9000 mg/kg • Inhalation: rat LC50 >5.14 mg/L/4 hr • Inhalation: human TCLo: 2300 µg/m3
MOLYBDENUM (Mo)	7439-98-7	231-107-2	• Ingestion: rat LD50 4461 mg/kg • Inhalation: rat LC50 5.1 mg/L/4 hr. • Inhalation: Dermal rabbit LD50 >2000 mg/kg
NICKEL (Ni)	7440-02-0	231-111-4	• Ingestion: rat LD50 >9000 mg/kg • Inhalation: rat LC50 >10.2mg/L/1 hr. • Inhalation: rabbit TCLo: 130 µg/m3 35 weeks (intermittent – 6 hrs.)
COPPER (Cu)	7440-50-8	231-159-6	• Ingestion: rat LD50 >2000 mg/kg • Ingestion: Dermal rat LD50 >2000 mg/kg • Inhalation: rat LC50 >5.11 mg/L/4 hr.
SILICON (Si)	7440-21-3	231-130-8	• Ingestion: rat LD50 >5000 mg/kg • Inhalation: rat LC50 >2.08 mg/L • Inhalation: Dermal rabbit LD50 >5000 mg/kg
Niobium (Nb)	7440-03-1	231-113-5	• No toxicity data available.
Hexavalent Chromium (fume constituent)	1333-82-0	215-607-8	• Ingestion: Rat: LD50: 80 mg/kg • Inhalation: rat LC50 167 mg/m3/4 hr. • Inhalation: Dermal Rabbit 57 mg/kg • Inhalation: Human: TCLo: 110µg/m3 3 yrs. (continuous) • Hexavalent Chromium is corrosive to rabbit eyes and rabbit skin.

LC50: Lethal Concentration of gases (50% kill) TCLo: Lowest Concentration to cause a symptom LD50 Lethal dose of solids or liquids (50% kill)

LDLo: Lowest Dose to cause lethal or toxic effects

SECTION 12: Ecological information

In solid form the welding consumables listed in this SDS pose no special environmental problems. However metal powders, fumes and dust from welding processes may have a significant impact on air and water quality.

Special considerations should be taken to control the airborne emissions, spills and releases of these powders, fumes and dust in to the environment through streams, sewer systems, ground water, surface soil etc.

EXOTOXICITY

INGREDIENT	CAS NUMBER	EINCS	Aquatic Toxicity Values
IRON (Fe)	7439-89-6	231-096-4	• 96 hr. LC50 Cyprinus carpio 0.56 mg/L



MANGANESE (Mn)	7439-96-5	231-105-1	• 48 hr EC50 Daphnia magna > 1.6 mg/L • 96 hr LC50 Oncorhynchus mykiss >3.6 mg/L • 72 hr EC50 desmodesmus subspicatus 4.5 mg/L
MOLYBDENUM (Mo)	7439-98-7	231-107-2	• 48 hr LC50 Daphnia magna 2729.4 mg/L • 96 hr LC50 Pimephales promelas 609.1 mg/L
NICKEL (Ni)	7440-02-0	231-111-4	• 48 hr EC50 Pseudokirchneriella subcapitata 0.18 mg/L • 48 hr. EC50 Daphnia magna 1 mg/L • 96 hr LC50 Oncorhynchus mykiss 15.3 mg/L • 96 hr. LC50 Cyprinus carpio 1.3 mg/L
COPPER (Cu)	7440-50-8	231-159-6	• 48 hr. EC50 Daphnia magna 0.03 mg/L • 72hr. EC50 Pseudokirchneriella subcapitata 0.046 – 0.0535 mg/L • 96 hr LC50 Pimephales promelas 0.0068 – 0.0156 mg/L • 96 hr. EC50 Pseudokirchneriella subcapitata 0.031-0.054 mg/L

LC50: Lethal Concentration (50% kill) EC50: Effect Concentration in water

Persistence and degradability: Biodegradation is not applicable to inorganic substances.

Bio accumulative potential: No data available.

Mobility in the soil: No data available

Other adverse effects: No data available

SECTION 13: Disposal information

Recycle scrap wire or rods when possible. Dispose of any powder, dust, weld grinding residue, fume or flux in an environmentally acceptable manner and in full compliance with federal, state, and local regulations.

SECTION 14: Transport information

No international regulations or restrictions are applicable. Ship in accordance with DOT/ADR/RID/ADNR/IMDG/ICAO/IATA. No special precautions are necessary.

UN Number: Not a dangerous material within the context of transport regulations.

UN Proper shipping name: Not Applicable

Transport hazard class: Not applicable

Packing group: Not Applicable

Environmental hazards: Refer to Section 12

Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code): Not applicable.

Special precautions which a user needs to be aware of, or to comply with, in connection with transport or conveyance within or outside their premises:
Not applicable.

SECTION 15: Regulatory information

US FEDERAL REGULATIONS:

OSHA: Listed as air contaminants and hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

TSCA: Toxic Substance Control Act – All ingredients of this SDS are listed on the TSCA inventory.

CERCLA: The ingredients listed on this SDS are not subject to CERCLA reporting requirements.

SARA HAZARD CATEGORY (311/312): Acute (Immediate) Health Hazard, Chronic (Delayed) Health Hazard

SARA Title III Section 313 Toxic Chemicals:

CHROMIUM (Cr)*	7440-47-3	231-157-5	10.5-35%
MANGANESE (Mn)*	7439-96-5	231-105-1	0-13.5%
NICKEL (Ni)*	7440-02-0	231-111-4	0-37%
COPPER (Cu)*	7440-50-8	231-159-6	0-4%

*Includes all compounds of these ingredients.

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (TPQ): None

STATE REGULATIONS

CALIFORNIA PROPOSITION 65: WARNING: The products covered by this SDS contain chromium and nickel. When the product is used in normal processes, fumes and gases will be generated such as hexavalent chromium compounds and nickel compounds which are known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code Section 25249.5 et seq.).

INGREDIENT	CAS NUMBER	Massachusetts Right to know (RTK) list	Minnesota Hazardous Substance List	New Jersey RTK Hazardous Substance List	Pennsylvania RTK list
CHROMIUM (Cr)	7440-47-3	Yes	Yes	Yes	Yes
NICKEL (Ni)	7440-02-0	Yes	Yes	Yes	Yes
COPPER (Cu)	7440-50-8	Yes	Yes	Yes	Yes



MANGANESE (Mn)	7439-96-5	Yes	Yes	Yes	Yes
MOLYBDENUM (Mo)	7439-98-7	Yes	Yes	Yes	Yes
SILICON (Si)	7440-21-3	Yes	Yes	Yes	Yes

INTERNATIONAL REGULATIONS

CANADIAN WHMIS CLASSIFICATION: Class D, Division 2, Subdivision A.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): All constituents of these products are on the Domestic Substance List (DSL).

SECTION 16: Other information

Read and understand the manufacturer's instructions and precautionary label on the product packaging as well as your employer's safety practices. Take all necessary precautions to protect yourself and others.

See American National Standard (ANSI) Z49.1 "Safety in Welding and Cutting," ANSI/American Welding Society (AWS) F1.5 "Methods for Sampling and Analyzing Gases from Welding and Allied Processes," ANSI/AWS F1.1 "Methods for Sampling Airborne Particles Generated by Welding and Allied Processes," AWS F3.2M/F3.2 "Ventilation Guide for Weld Fumes," American Welding Society, 550 North Le Jeune Road, Miami, FL 33135. Safety and Health Fact Sheets available from AWS at www.aws.org. OSHA Publication 2206 (29 C.F.R. 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. Threshold Limit Values and Biological Exposure Indices, American Conference of Governmental Hygienists (ACGIH), 6500 Glenway Ave., Cincinnati, OH 45211, USA. NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work," published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169.

See CSA Standard CAN/CSA-W117.2-01 "Safety in Welding, Cutting and Allied Processes".

The following Risk and H-Phrase Texts and Hazard Statements correspond with the columns labeled EU Classification 67/548/EEC and GHS-US Classification within Section 3 of this safety data sheet. Take appropriate precautions and protective measures to eliminate or limit the associated hazard.

EU Directive 67/548/EEC-Risk Phrase Texts

R9-Explosive when mixed with combustible material	R48/20-Harmful: danger of serious damage to health by prolonged exposure through inhalation
R20/22-Harmful by inhalation and if swallowed	R48/20/22-Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed
R24/25-Toxic in contact with skin and if swallowed	R48/23-Toxic: danger of serious damage to health by prolonged exposure through inhalation
R26-Very toxic by inhalation	R50-Very toxic to aquatic organisms
R35-Causes severe burns	R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R36/37-Irritating to eyes and respiratory system	R53-May cause long-term adverse effects in the aquatic environment
R40-Limited evidence of a carcinogenic effect	R62-Possible risk of impaired fertility
R42/43-May cause sensitization by inhalation and skin contact	Carc 1 – Carcinogen Category 1
R43-May cause sensitization by skin contact	Carc 3 – Carcinogen Category 3
R45-May cause cancer	Muta 2 – Mutagen Category 2
R46-May cause heritable genetic damage	Repr 3 – Reproductive Toxicity Category 3

Additional H-Phrase Texts

Acute Tox. 2: Acute Toxicity Category 2 (H310, H330)	H301: Toxic if swallowed
Acute Tox. 3: Acute Toxicity Category 3 (H301)	H310: Fatal in contact with skin
Aquatic Acute 1: Hazardous to the aquatic environment – Acute Hazard, Category 1 (H400)	H314: Causes severe skin burns and eye damage
Aquatic Chronic 1: Hazardous to the aquatic environment – Chronic Hazard Category 1 (H410)	H330: Fatal if inhaled
Skin Corr 1A: Skin Corrosion Category 1A (H314)	H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
Resp Sens 1: Respiratory Sensitization Category 1 (H334)	H340: May cause genetic defects
Repr 2: Reproductive Toxicity Category 2 (H360)	H350: May cause cancer
Muta 1B: Germ Cell Mutagenicity Category 1B (H340)	H360: May damage fertility or unborn child
Carc. 1A: Carcinogenicity Category 1A: (H350)	H400: Very toxic to aquatic life
	H410: Very toxic to aquatic life with long lasting results

Definitions pertaining to Section 8 & 16

CL (Ceiling Limit): The concentration that should not be exceeded during any part of the working exposure

HMIS: Hazardous Materials Identification System

IOELV: Indicative Occupational Exposure Limit Values – an exposure limit established by the European Union



NFPA: National Fire Protection Association

OEL (Occupation Exposure Limit): An occupational exposure limit that is an upper limit on the acceptable concentration of a hazardous substance in the workplace

PEL (Permissible Exposure Limit; OSHA (29 CFR 1910)): An exposure limit that is published and enforced by OSHA as a legal standard

STEL (Short Term Exposure Limit; OSHA (29 CFR 1910)): A 15 minute time weighted average exposure which should not be exceeded at any time during a work day

TLV (Threshold Limit Value; American Conference of Governmental Industrial Hygienists): Time Weighted Average (TWA) concentration for a normal 8-hour work day and a 40 hour work week to which nearly all workers may be repeatedly exposed without adverse effect

NFPA health hazard: 1 – Exposure could cause irritation but only minor residual injury even if no treatment is given

NFPA fire hazard: 0 – Materials that will not burn

NFPA reactivity: 0 – Normally stable even under fire exposure conditions, and are not reactive with water



HMIS III Rating

Health: 2 Moderate Hazard – Temporary or minor injury may occur

Flammability: 0 Minimal Hazard

Physical: 0 Minimal Hazard

SDS Date of Preparation: September 1, 2015

The information and recommendations contained within this Safety Data Sheet (SDS) have been compiled from sources believed to be reliable and to represent the best information available to Victory Welding Alloys Inc. at the time of issue. However, as the conditions or methods of use are beyond our control, Victory Welding Alloys Inc. makes no guarantee or warranty as to the accuracy, suitability or completeness of the information contained herein. This SDS is intended solely for the user's health and safety education and not for contract specification purposes. No warranty, guarantee or representation is made by Victory Welding Alloys Inc. nor does Victory Welding Alloys Inc. assume any liability for results obtained or damages incurred in connection with any use of this information, nor can we assume customer liability.