U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form). Format meets ANSI Z400.1-1998, OSHA 1910.1200 and WHMIS requirements.

Safety Data Sheet

"According to (EC) No. 1907/2006 REACH"

Section 1: Product and Company Identification

Product type and use:	**STAINLESS STEEL WIRE GTAW, GMAW, SAW**
Trade Name AWS Classification:	ER16.8.2, ER308, ER308H, ER308L, ER308LSi, ER309(H), ER309L, ER309LSi, ER309LMo(Mod), ER310, ER312, ER316(H), ER316L, ER316LSi, ER317L, ER320LR, ER321, ER330, ER347, ER385, ER410, ER410NiMo(Mod), ER420, ER430, ER630, ER2209, ER2594
AWS Specification:	A5.9
Manufacturer:	TECHNIWELD USA LLC.
Physical Address:	6205 BOAT ROCK BLVD ATLANTA, GA 30336
Mailing Address:	P.O. Box 44226 ATLANTA, GA 30336
Business Phone:	404-699-9900
Business Fax:	404-699-7800
E-mail Address:	info@TWusa.COM
Web Address:	www.TWusa.COM
Emergency Phone:	CHEMTREC (24-Hour) 1-800-424-9300 Outside of the USA & Canada 1-703-527-3887
Date of Preparation:	August 10, 2019 (Revised April 27, 2022)

Section 2: Hazard(s) Identification

IMPORTANT - this section covers the hazardous materials from which this product is manufactured. The fumes and gases produced during welding with normal use of this product are also addressed in Section 8. The term "hazardous" in this section should be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200).

HAZARDOUS INGREDIENT	CAS	EINECS[2]	REGULATORY HAZARD CLASSIFICATION/DESIGNATION 67/548/EEC[Δ]	IARC[E]	NTP[Z]	OSHA[H]	65°
Chromium	7440-47-3	231-157-5	O - R9; Carc 1 Φ - R45; Muta 2 - R46; Repr 3 - R62; T+ - R26; T - R24/25, R48/23; C - R35, R42/43; N - R50, R53 [ΣΣΣ]	1 ΣΣ , 3 [Σ]	K [ΣΣ]	X [ΣΣ]	X [ΣΣ]
Iron	7439-89-6	231-096-4	None	---	---	---	---
Manganese	7439-96-5	231-105-1	Xn - R20/22 Y	---	---	---	---
Molybdenum	7439-98-7	231-111-4	Xn - R48/20/22; Xi - R36/37X	---	---	---	---
Nickel	7440-02-0	231-107-2	Carc 3 Φ - R40; T - R43, R48/23	1	K	X	X

Silicon	7440-21-3	231-130-8	None	---	---	---	---
(Amorphous Silica Fume)	69012-64-2	273-761-5	None	3	K	---	X

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 – Possibly 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 Θ – California Proposition 65 (X – On Proposition 65 list) --- Dashes indicate the ingredient is not listed with the IARC, NTP, OSHA or 65 Φ – Carcinogen, Mutagen or Reproductive Category per European Council Directive 67/548/EEC Annex I 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 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 ROUTE 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 both are dependent upon the metal being welded, the process, procedures and electrodes used. Most fume ingredients are present as complex oxides and compounds and not as pure metals. When the electrode is consumed, the fume and gas decomposition products generated are different and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction of oxidation of the materials shown in this section, plus those from the base metal and coating, etc., as noted above. Monitor for the identified in the list within this section.

Fumes from the use of this product may contain complex oxides or compounds of the following elements and molecules: amorphous silica fume, cooper and manganese. Other reasonably expected constituents of the fume would also include the complex oxides of iron and molybdenum. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. 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 amount of ventilation, the 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 a degreasing activities). One recommended way to determine the composition and quality of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet of worn or in the workers 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 3: Composition and Information on Ingredients

INGREDIENT	CAS NO.	EINECS	%WEIGHT
Chromium	7440-47-3	231-157-5	5-35
Iron	7439-89-6	231-096-4	40-90
Manganese	7439-96-5	231-105-1	0-5
Molybdenum	7439-98-7	231-107-2	0-4
-Nickel	7440-02-0-	231-111-4	0-40
-Silicon	7440-21-3	231-130-8	0-1
-(Amorphous Silica Fume)	69012-64-2	273-761-5	-

Section 4: First Aid Measures

Inhalation: If dust or fumes inhaled, provide fresh air and call physician. If breathing has stopped, perform artificial respiration and obtain medical assistance immediately.

Eye contact: For radiation burns due to arc flash, see physician. To remove dust, fumes or particulates flush with water for at least fifteen minutes. If irritation persists, obtain medical assistance.

Skin contact: The unused welding product does not irritate the skin but wear gloves to prevent possible allergic reactions. For skin burns from arc radiation, promptly flush with cold water. Get medical attention for burns or irritations that persist. To remove dust or particles wash with mild soap and water.

Electric shock: Disconnect and turn off the power. Use a nonconductive material to pull victim away from contact with live parts or wires. If not breathing, begin artificial respiration, preferably mouth-to-mouth. If no detectable pulse, begin Cardio Pulmonary Resuscitation (CPR). Immediately call a physician.

General: Move to fresh air and call for medical aid.

Section 5: Fire Fighting Measures

Welding consumables applicable to this sheet as shipped are non reactive, non-flammable, non-explosive and essentially nonhazardous until welded. Welding arcs and sparks can ignite combustibles and flammable products. Unused welding consumables may remain hot for a period of time after completion of welding process. Wear self-contained breathing apparatus as fumes or vapours may be harmful. See American National Standard (ANSI) Z49.1 for further general safety information on the use and handling of welding consumables and associated procedures.

Section 6: Accidental Release Measures

Procedure for cleanup of spills or leaks: Not applicable. Solid objects can be picked up and placed into a container. Do not allow to enter surface, sewers or ground water. Wear proper personal protective equipment while handling.

Section 7: Handling and Storage

Handling: Handle with care to avoid stings and cuts. Hold the welding wire manually when loosening the wire. Wear gloves when handling welding consumables. Wash hands / shower before breaks and end of work. Avoid exposure to dust. Local exhaust ventilation of the working area. Some individuals can develop an allergic reaction to certain materials. Retain all warning and identity labels.

Storage: Keep separate from chemical substances like acids and strong bases, which could cause chemical reactions. Avoid humidity and temperature shocks. Store welding consumables inside a room without humidity. Do not store welding consumables directly on the ground or beside a wall. Storage temperature 21°C ± 2°C, Relative humidity max. % 60.
Because of any reason if protective nylon of the packing was torn or pierced and it won't be used, immediately the packing should repacked.

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/m 3 – Total Dust. The ACGIH TLV for Particles – Not Otherwise Specified (PNOS) is 3 mg/m 3 – Respirable Particles, 10 mg/m 3 – 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 NO.	EINECS NO.	OSHA EPL	ACGIH TLV	EU OEL
Chromium	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) {A1} 0.05 (Cr VI Sol. Cpnds) {A1} 0.0105 (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+	7439-89-6	231-096-4	5 R*	5 R* (Fe2O3)	3 R* (Aerosol as Fe2O3) – Switzerland 7*** (as Fe2O3) - Denmark
MANGANESE#	7439-96-3	231-105-1	5 CL ** (Fume) 1, 3 STEL***	0.1I* {A4} u 0.2 R* u u	0.02 R*(Aerosol); 0.16 R*** (Aerosol) - Germany 0.2 I*(Aerosol) - Germany 0.2; 0.4*** - Denmark
MOLYBDENUM	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#	7440-02-0	231-111-4	1 (Metal) 1 (Sol. Cpnds) 1 (Insol. Cpnds)	1.5 I* (Ele) {A5} 0.1 I* (Sol Cpnds) {A4} 0.2 I* (Insol Cpnds) {A1}	0.05; 0.1*** - Denmark
SILICON	7440-21-3	231-130-8	5 R*	3 R*	4 R* (Aerosol); 10 I* (Aerosol) - Denmark
(AMORPHOUS SILICA FUME)	69012-64-2	273-761-5	0.8	3 R*	2 I*; 4 I*** - Denmark
SODIUM OXIDE	7681-49-5	215-208-9	5 R*	3 R*	1.5 R*(Dust NOS - Aerosol) - Germany
STRONTIUM CARBONATE +	1633-05-2	216-643-7	5 R*	3 R*	1.5 R* (as Dust - NOS) - Germany
TITANIUM DIOXIDE	13463-67-7	236-675-5	15 (Dust)	10 {A4}	1.5 R* - Germany

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 (noncrystalline) form #- Reportable material under Section 313 of SARA ## - Reportable material under Section 313 of SARA only in fibrous form V - NIOSH REL TWA and STEL u - Limit of 0.1 mg/m 3 is for Inhalable Mn in 2013 by ACGIH u u - Limit of 0.02 mg/m 3 is for Respirable Mn in 2013 by ACGIH 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 (noncrystalline) form

VENTILATION: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases below PEL/TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. Keep exposures as low as possible.

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 recommended exposure limit.

HAND PROTECTION: Wear heat protecting gloves (Non-flammable). For hygiene wash hands before breaks and end of work.	
EYE PROTECTION: Wear helmet or use face shield with filter lens. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others.	
PROTECTIVE CLOTHING: Wear hand, head and body protection which help to prevent injury from radiation, sparks and electrical shock. See Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark nonsynthetic clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.	
SPECIAL PRECAUTIONS (IMPORTANT): Maintain exposure below the PEL/TLV. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. For hygiene, wash hands before breaks and end of work. Do not eat, drink or smoke in working areas.	

Section 9: Physical and Chemical Properties

Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, nonexplosive and essentially nonhazardous until welded.

PHYSICAL STATE:	Cored Wire
COLOR:	Gray
ODOR:	N/A
FORM:	Coated Rod

Section 10: Stability and Reactivity

General: Welding consumables applicable to this sheet are solid and nonvolatile as shipped. This product is only intended for use per the welding parameters it was designed for. When this product is used for welding, hazardous fumes may be created. Other factors to consider include the base metal, base metal preparation and base metal coatings. All of these factors can contribute to the fume and gases generated during welding. The amount of fume varies with the welding parameters.

Stability: This product is stable under normal conditions.

Reactivity: Contact with acids or strong bases may cause generation of gas.

Section 11: Toxicological Information

SHORT-TERM (ACUTE) OVEREXPOSURE EFFECTS:

Welding Fumes - May result in discomfort such as dizziness, nausea or dryness or irritation of nose, throat or eyes.
Chromium - Inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory tract, lung damage and asthma-like symptoms. Swallowing chromium (VI) salts can cause severe injury or death. Dust on skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions may occur in some people.
Iron, Iron Oxide - None are known. Treat as nuisance dust or fume.
Manganese - Metal fume fever characterized by chills, fever, upset stomach, vomiting, irritation of the throat and aching of body. Recovery is generally complete within 48 hours of the overexposure.
Molybdenum - Irritation of the eyes, nose and throat.
Nickel, Nickel Compounds - Metallic taste, nausea, tightness in chest, metal fume fever, allergic reaction.
Silica (Amorphous) - Dust and fumes may cause irritation of the respiratory system, skin and eyes.

LONG-TERM (CHRONIC) OVEREXPOSURE EFFECTS:

Welding Fumes - Excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis."

Chromium - Ulceration and perforation of nasal septum. 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. 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 - Can cause siderosis (deposits of iron in lungs) which some researchers believe may affect pulmonary function. Lungs will clear in time when exposure to iron and its compounds ceases. Iron and magnetite (Fe_3O_4) are not regarded as fibrogenic materials.

Manganese - Long-term overexposure to manganese compounds may affect the central nervous system. Symptoms may be similar to Parkinson's disease and can include slowness, changes in handwriting, gait impairment, muscle spasms and cramps and less commonly, tremor and behavioral changes. Employees who are overexposed to manganese compounds should be seen by a physician for early detection of neurologic problems. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait.

Molybdenum - Prolonged overexposure may result in loss of appetite, weight loss, loss of muscle coordination, difficulty in breathing and anemia.

Nickel, Nickel Compounds - Lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers.

Silica (Amorphous) - Research indicates that silica is present in welding fume in the amorphous form. Long term overexposure may cause pneumoconiosis. Noncrystalline 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. Employ first aid techniques recommended by the American Red Cross. Eyes and Skin: If irritation or flash burns develop after exposure, consult a physician.

CARCINOGENICITY: Chromium VI compounds and nickel compounds are classified as IARC Group 1 and NTP Group K carcinogens. Chromium VI, nickel compounds and welding fumes must be considered as possible carcinogens under OSHA (29 CFR 1910.1200). CALIFORNIA PROPOSITION 65: WARNING: These products contain or produce a chemical 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.)

Section 12: Ecological Information

Welding consumables and materials could degrade/weather into components originating from the consumables or from the materials used in the welding process. Avoid exposure to conditions that could lead to accumulation in soils or groundwater.

Section 13: Disposal Considerations

WASTE DISPOSAL: Disposal must be made according to official regulations. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with Federal State and local regulations. Use recycling procedures for material if available.

Section 14: Transportation Information

No international regulations or restrictions are applicable. No special precautions are necessary.

Section 15: Regulatory Information

Read and understand the manufacturer's instructions, your employer's safety practices and the health and safety instructions on the label and the material safety data sheet. Observe all local and federal rules and regulations. Take all necessary precautions to protect yourself and others.

United States EPA Toxic Substance Control Act: All constituents of these products are on the TSCA inventory list or are excluded from listing.

CERCLA/SARA TITLE III: Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs):
Ingredient name RQ(lb) TPQ (lb)
Products on this SDS are a solid solution in the form of a solid article

Spills or releases resulting in the loss of any ingredient at or above its RQ require immediate notification to the National Response Center and to your Local Emergency Planning Committee.

Section 311 Hazard Class

As shipped: Immediate In use: Immediate delayed

EPCRA/SARA TITLE III 313 TOXIC CHEMICALS: The following metallic components are listed as SARA 313 "Toxic Chemicals" and potentially subject to annual SARA 312 reporting: Chromium, Manganese and Nickel. See Section 3 for weight percentage.

CANADIAN WHMIS CLASSIFICATION: Class D; Division 2, Subdivision A
CANADIAN ENVIRONMENTAL PROTECTIONACT (CEPA): All constituents of these products are on the Domestic Substance List (DSL).

Section 16: Other Information

The following Risk and Safety Phrase Texts and Hazard Statements correspond with the columns labeled - EU 67/548/EEC within Section 2 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
R20/22 – Harmful by inhalation and if swallowed
R24/25 – Toxic in contact with skin and if swallowed
R26 – Very toxic by inhalation R35 – Causes severe burns
R36/37 – Irritating to eyes and respiratory system
R40 – Limited evidence of a carcinogenic effect
R42/43 – May cause sensitization by inhalation and skin contact
R43 – May cause sensitization by skin contact
R45 – May cause cancer
R46 – May cause heritable genetic damage
R48/20/22 – Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed
R48/23 – Toxic: danger of serious damage to health by prolonged exposure through inhalation
R50 – Very toxic to aquatic organisms
R53 – May cause long-term adverse effects in the aquatic environment
R62 – Possible risk of impaired fertility

For additional information please refer to the following sources:
USA: 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 "Method for Sampling

Airborne Particles Generated by Welding and Allied Processes", AWSF3.2M/F3.2 "Ventilation Guide for Weld Fume", American Welding Society, 550 North Le Jeune Road, Miami, Florida, 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, Ohio 45211, USA. NFPA 51B "Standard for Fire Prevention during Welding, Cutting and Other Hot Work" published by the National Fire Protection Association, 1 Battery march Park, Quincy, MA 02169.

UK: WMA Publication 236 and 237, "Hazards from Welding Fume", "The arc welder at work, some general aspects of health and safety".

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

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