



American Wire Research Inc.

Date:	2016/01/01	SDS No.:	M0054 AWR-SDS-SS-1
Product Type:	Stainless Steel Welding Wires and Rods		
Supersedes:			

SAFETY DATA SHEETS

Conforms to Hazard Communication Standard, 29 CFR 1910.1200 Appendix D

SECTION 1: IDENTIFICATION

Identification of the substance or preparation

Product Type: Stainless Steel Welding Wires or Rods

This SDS covers all stainless steel welding wires or rods manufactured or supplied by American Wire Research at the following location:

Company/undertaking identification

Manufacturer/Supplier: American Wire Research Inc.

Address: 1005 Airbrake Ave, Wilmerding, PA 15148

Tel: +1-412-349-8431 Fax: +1-412-774-5005

All materials listed have a Wt. % of 1% or Greater except for Ni & Cr which are listed at 0.1% or Greater

Product name and nominal composition

Product Name	Classification	Cr	Ni	Mo	Mn	Fe	Cu
AW-307 / AWT-307	AWS A5.9 ER307	18.6	8.1		6.3	Bal.	
AW-308H / AWT-308H / ASA-308H	AWS A5.9 ER308(H)	19.7	9.6		2.1	Bal.	
AW-308L / AWT-308L / ASA-308L	AWS A5.9 ER308L	20.0	9.7		2.2	Bal.	
AW-308LSi / AWT-308LSi	AWS A5.9 ER308LSi	19.8	10.2		1.9	Bal.	
AW-309H / AWT-309H / ASA-309H	AWS A5.9 ER309(H)	23.1	13.1		1.7	Bal.	
AW-309L / AWT-309L / ASA-309L	AWS A5.9 ER309L	23.0	13.5		2.0	Bal.	
AW-309LSi / AWT-309LSi	AWS A5.9 ER309LSi	23.1	13.7		1.7	Bal.	
AW-309LMo / AWT-309LMo / ASA-309LMo	AWS A5.9 -ER309LMo	21.3	14.9	2.7	1.4	Bal.	
AW-310 / AWT-310 / ASA-310	AWS A5.9 ER310	26.6	21.0		1.8	Bal.	
AW-312 / AWT-312 / ASA-312	AWS A5.9 ER312	30.5	8.8		1.6	Bal.	
AW-316H / AWT-316H / ASA-316H	AWS A5.9 ER316(H)	19.2	12.1	2.2	1.6	Bal.	
AW-316L / AWT-316L	AWS A5.9 ER316	18.7	11.8	2.5	1.6	Bal.	
AW-316LSi / AWT-316LSi / ASA-316L	AWS A5.9 ER316LSi	18.3	11.3	2.5	1.6	Bal.	
AW-317L / AWT-317L / ASA-317L	AWS A5.9 ER317L	18.6	13.0	3.0	1.6	Bal.	
AW-318 / AWT-318	AWS A5.9 ER318	19.0	11.9	2.6	1.3	Bal.	
AW-318Si / AWT-318Si	AWS A5.9 ER318Si	19.0	11.9	2.6	1.3	Bal.	
AW-320LR / AWT-320LR / ASA-320LR	AWS A5.9 ER320LR	20.1	33.1	2.4	1.8	Bal.	3.4
AW-321 / AWT-321	AWS A5.9 ER321	19.5	9.2		1.4	Bal.	
AW-330 / AWT-330	AWS A5.9 ER330	17.0	25.0		1.5	Bal.	
AW-347 / AWT-347 / ASA-347	AWS A5.9 ER347(H)	19.0	9.0		1.6	Bal.	
AW-347Si / AWT-347Si	AWS A5.9 ER347Si	19.3	9.7		1.3	Bal.	
AW-385 / AWT-385 / ASA-385	AWS A5.9 ER385	20.0	25.0	4.3	1.7	Bal.	1.5
AW-409Nb / AWT-409Nb	AWS A5.9 ER409Nb	11.6	0.3			Bal.	
AW-410 / AWT-410 / ASA-410	AWS A5.9 ER410	12.6	0.3			Bal.	
AW-410NiMo / ASA-410NiMo	AWS A5.9 ER410NiMo	12.3	4.6	0.4		Bal.	
AW-420 / AWT-420 / ASA-420	AWS A5.9 ER420	13.5	0.3			Bal.	
AW-430 / AWT-430 / ASA-420	AWS A5.9 ER430	16.6	0.3			Bal.	
AW-430LNb	AWS A5.9 ER430LNb	18.1	0.4			Bal.	
AW-430NbTi	AWS A5.9 ER430NbTi	18.0	0.4			Bal.	
AW-439Ti	AWS A5.9 ER439(Ti)	17.8	0.4			Bal.	
AW-16-8-2 / AWT-16-8-2	AWS ER16.8.2	15.8	8.2	1.3	1.2	Bal.	
AW-630 / AWT-630 / ASA-630	AWS A5.9 ER630	16.2	4.6			Bal.	3.4
AW-2209 / AWT-2209 / ASA-2209	AWS A5.9 ER2209	22.8	8.8	3.2	1.7	Bal.	
AW-2594 / AWT-2594 / ASA-2594	AWS A5.9 ER2594	25.2	9.2	3.9		Bal.	
AW-253MA / AWT-253MA	253MA	20.9	10.2			Bal.	

SECTION 2: HAZARDS IDENTIFICATION

The term 'hazardous' in 'Hazardous Materials' should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard.

Emergency overview: These products consist of solid wire, which are odorless and may be copper coated. There are no immediate health hazards associated with the wire form of this product. These products are not reactive. If involved in a fire, these products may generate irritating iron fumes and a variety of metal oxides. Emergency responders must wear personal protective equipment suitable for the situation to which they are responding.

Warning: Protect yourself and others. Read and understand this information. When this product is used for its intended purpose, fumes and gases produced as a byproduct can be hazardous to your health. Aggravation of pre-existing respiratory or allergic conditions may occur in some workers. Arc Rays can injure eyes and burn skin. Electric shock can kill.

Short-term exposure: Metallic taste; nausea; tightness of chest; fever; irritation of eyes, nose, throat and skin; loss of consciousness/death due to welding gases or lack of oxygen.

Long-term exposure: Adverse effects may result from long-term exposure to welding fume, gases, or dusts. These effects may include skin sensitization, neurological damage, and respiratory disease such as bronchial asthma, lung fibrosis or pneumoconiosis. Chromium and nickel, and their compounds, are on the International Agency for Research on Cancer (IARC) and the National Toxicology Program (NTP) lists as posing a carcinogenic risk to humans.

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section 10; see for industrial hygiene information. CAS Number shown is representative for the ingredients listed.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients:	CAS No.	TLV ¹	PEL ²	REL ³	STEL ⁴	IDLH ⁵
Chromium	7440-47-3	0.5	1.0	0.5	NE	25
Nickel	7440-02-0	1.5	1.0	0.015	NE	10
Molybdenum	7439-98-7	5.0	10.0	NE	NE	1000
Manganese	7440-96-5	0.2	1.0	1.0	3.0	500
Iron	7440-89-6	10.0	10.0	5.0	NE	2500
Copper Dust (as Cu)	7440-50-8	0.2	1.0	1.0	NE	100

Notes: All values are in mg/m³

SDS Notes ¹ to ⁵ see section 16

NE = Not Established.

SECTION 4: FIRST-AID MEASURES

Turn off power and remove from exposure and obtain prompt medical attention. If victim is unconscious, administer oxygen. If not breathing, employ CPR (Cardiopulmonary Resuscitation) techniques immediately. If flu-like symptoms (cough, muscle pain, fever, chills, insomnia, or mental confusion) develop after use, obtain medical help immediately.

SECTION 5: FIRE-FIGHTING MEASURES

This material is not flammable. However, welding arc and sparks can ignite combustibles.

National Fire Protection Association (NFPA) Rating: Health -2 Flammability -0 Reactivity -0

Note: The NFPA Health rating is based on the fumes generated during normal use.

Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section 8

SECTION 6: ACCIDENTAL RELEASE MEASURES

Spill of Leak Procedure: These products are solid metal wire, with no spill or leak hazards.

SECTION 7: HANDLING AND STORAGE

Precautions: None

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Read and understand the manufacturer's instruction and the precautionary label on the product. See American National Standard Z49.1, 'Safety In Welding, Cutting and Allied Processes' published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL, 33126 (www.aws.org); and OSHA Safety and Health Standards, available from the U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. (www.osha.gov). for more details on many of the following

Ventilation: Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. Keep exposure as low as possible.

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined space or general work area when local exhaust or ventilation does not keep exposure below TLV.

Eye Protection: Wear helmet or use face shield with filter lens shade number 12*or darker. Shield others by providing screens and flash goggles. (*) No specific recommendation for submerged arc.

Protective Clothing: Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI-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 substantial clothing. Train the welder not to permit electrically live parts or electrodes to contact skin or clothing or gloves if they are wet. Insulate from work and ground.

Disposal Information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally acceptable manner according to Federal, State and Local Regulations unless otherwise noted.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Welding wire is a solid metal, shaped as wire of various diameters.

The following information is for the product:

Appearance and color: These products consist of solid wire, which is odorless and may be copper coated.

How to detect this substance (warning properties): The appearance is a distinctive characteristic of these products.

The following information is for elemental iron:

Odor threshold: Not applicable.

pH: Not applicable.

Melting point: 1535°C (2795°F).

Boiling point: 3000°C (5432°F).

Evaporation rate (nBuAc = 1): Not applicable.

Vapor pressure, mmHg @ 20°C: Not applicable.

Relative vapor density (air = 1): Not applicable.

Specific gravity (water = 1): 7.86 .

Solubility in water: Insoluble.

Coefficient of oil/water distribution (partition coefficient): Not applicable.

SECTION 10: STABILITY AND REACTIVITY

Stability Condition to Avoid: None

Materials to avoid: Avoid contact with mineral acids and oxidizing agents which may generate hydrogen gas

Hazardous Polymerization: Will Not Occur

Hazardous decomposition products: Welders are exposed to a range of fumes and gases. Fume particles contain a wide variety of oxides and salts of metals and other compounds, which are produced mainly from electrodes, filler wire and flux materials. Fumes from the welding of stainless steel and other alloys contain nickel compounds and chromium [VI] and [III]. Ozone is formed during most electric arc welding, and exposures can be high in comparison to the exposure limit, particularly during metal inert gas welding of aluminum. Oxides of nitrogen are found during manual metal arc welding and particularly during gas welding. Welders who weld painted mild steel can also be exposed to a range of organic compounds produced by pyrolysis.

Welding Fume and Gases By-product Exposure Limits

Ingredients:	CAS No.	TLV ¹	PEL ²	REL ³	STEL ⁴	IDLH ⁵
Carbon Monoxide (CO)	630-08-0	28.6	55	40		1200
Chromium (Cr II and Cr III)	7440-47-3	0.5	0.5	0.5		25

Cobalt Fume (Co)	7440-48-4		0.1	0.05		20
Copper Fume (as CuO & Cu)	1317-38-0	0.2	0.1	0.1		100
Fluorides (F)		2.5	2.5			
Hexavalent Chromium ¹ (Cr VI)	1333-82-0	0.5	0.005	0.5		25
Iron Oxide Fume (as Fe ₂ O ₃)	1309-37-1	5.0	10.0	5		2500
Manganese Fume (Mn)	7439-96-5	0.2	(C)5.0 ⁶	1	3.0	500
Molybdenum (Soluble) (Mo)	7439-98-7	10.0	5.0			1000
Nickel Metal (Ni)	7440-02-0	1.5	1.0	0.015		10
Nitrogen Dioxides (as NO ₂)	10102-44-0	5.6	(C)9.0 ⁶	1.8		37.6
Ozone (O ₃)	10028-15-6	0.4	0.2	(C)0.2 ⁶		9.8
Phosgene ³ (COCl ₂)	75-44-5	0.4	0.4	0.4	0.8	8.1

SECTION 11: TOXICOLOGICAL INFORMATION

There is limited evidence in humans for the carcinogenicity of welding fumes and gases. IARC identifies Welding Fumes as a possible carcinogenic to humans (Group 2B). Nickel (Ni) and Cobalt (Co) are listed as Group 2B possible human carcinogen. Hexavalent Chromium (Cr VI) is a listed as a Class 1 human carcinogen by IARC.

- Canadian WHMIS Class D, Division 2B (Toxic).

SECTION 12: ECOLOGICAL INFORMATION (NON-MANDATORY)

Ecological Information: Not Applicable

SECTION 13: DISPOSAL CONSIDERATIONS (NON-MANDATORY)

Waste Disposal Methods: Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container, or liner in an environmentally acceptable manor, in full compliance with federal state and local regulations.

SECTION 14: TRANSPORT INFORMATION (NON-MANDATORY)

Proper Shipping Name: Not regulated by DOT, IMO, IATA or RID/ADR

SECTION 15: REGULATORY INFORMATION (NON-MANDATORY)

SARA Title III: Not Applicable. However, large users may need to calculate and add their welding fume emissions to their inventory of the toxic emissions, using the material percentages listed in Section 1.

TSCA: All material contained within this product are on the TCSA Inventory List.

California Proposition 65 Warning: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the state of California to cause cancer (California Health & Safety Code § 25249.6).

LABELING (Precautionary Statements):

WARNING: PROTECT yourself and others. Read and understand this information.

FUMES AND GASES can be hazardous to your health.

ARC RAYS can injure eyes and burn skin.

ELECTRIC SHOCK can KILL.

- Before use, read and understand the manufacturer's instructions, Safety Data Sheets (SDS), and your employer's safety practices.
- Keep your head out of the fumes.
- Use enough ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing zone and the general area.
- Wear correct eye, ear, and body protection.
- Do not touch live electrical parts.

SECTION 16: OTHER INFORMATION

SDS NOTES:

- (1) Threshold Limit Value (TLV) -8-hour TWA as defined by American Conference of Governmental Industrial Hygienists (ACGIH).
- (2) Permissible Exposure Limit (PEL) -8-hour TWA exposure as defined by OSHA(29CFR1910)
- (3) Recommended Exposure Limit (REL) -8-hour TWA as defined by National Institute of Occupational Safety & Health (NIOSH)
- (4) Short Term Exposure Limit (STEL) -15 minute TWA exposure as defined by OSHA (29CFR1910.1200) or certain state regulations
- (5) Immediately Dangerous to Life & Health (IDLH) – As defined by OSHA and NIOSH.
- (6) Ceiling Value (C) -Exposure which shall not be exceeded at any time during the working day.