American Wire Research Inc.

Date:	2016/01/01	SDS No.:	M0054 AWR-SDS-SS-FCAW-1
Product Type:	Stainless Steel Electrodes for Flux Cored Arc Welding		
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 Electrodes for Flux-Cored Arc Welding

This SDS covers all Stainless Steel electrodes for Flux-Cored Arc Welding products 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

Product name and nominal composition

Product Name	Classification	C	Si	Mn	P	S	Cr	Ni	Mo
AFX-308HT1	AWS A5.22 E308HT1-1/4	0.050	0.45	1.35	0.025	0.004	19.41	9.85	--
AFX-308HT0	AWS A5.22 E308HT0-1/4	0.050	0.55	1.64	0.034	0.005	19.09	9.23	--
AFX-308LT1	AWS A5.22 E308LT1-1/4	0.037	0.45	1.33	0.025	0.004	19.37	9.87	--
AFX-308LT0	AWS A5.22 E308LT0-1/4	0.036	0.68	1.62	0.034	0.005	19.09	9.44	--
AFX-309LT1	AWS A5.22 E309LT1-1/4	0.032	0.48	1.25	0.024	0.002	23.10	12.48	--
AFX-309LT0	AWS A5.22 E309LT0-1/4	0.035	0.53	1.14	0.020	0.004	24.01	12.16	--
AFX-309LMoT1	AWS A5.22 E309LMoT1-1/4	0.036	0.44	1.53	0.029	0.006	23.38	12.81	2.52
AFX-309LMoT0	AWS A5.22 E309LMoT0-1/4	0.037	0.63	1.81	0.031	0.006	23.60	12.32	2.48
AFX-316LT1	AWS A5.22 E316LT1-1/4	0.037	0.44	1.16	0.030	0.005	18.17	121.48	2.35
AFX-310T1	AWS A5.22 E310T1-1/4	0.11	0.41	1.90	0.01	0.01	27.30	21.54	--
AFX-310T0	AWS A5.22 E310T0-1/4	0.19	0.66	1.80	0.01	0.01	26.79	21.13	--
AFX-316LT0	AWS A5.22 E316LT0-1/4	0.036	0.47	1.46	0.030	0.006	19.43	12.57	2.60
AFX-317LT1	AWS A5.22 E317LT1-1/4	0.025	0.59	1.11	0.021	0.008	19.16	13.11	1.50
AFX-317LT0	AWS A5.22 E317LT0-1/4	0.020	0.59	1.10	0.020	0.010	19.52	13.02	3.36
AFX-347T1	AWS A5.22 E347T1-1/4	0.035	0.49	1.68	0.028	0.005	19.15	10.56	--
AFX-347T0	AWS A5.22 E347T0-1/4	0.050	0.39	1.64	0.021	0.010	19.16	9.68	--
AFX-2209T1	AWS A5.22 E2209T1-1/4	0.038	0.55	1.25	0.024	0.005	23.60	9.68	--
AFX-2209T0	AWS A5.22 E2209T0-1/4	0.038	0.41	1.31	0.027	0.005	23.46	9.44	--

Notes: All materials listed in Wt. %

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 is 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.	Wt.%
Titanium dioxides	13463-67-7	4
Chromium and chromium alloys or compounds (as Cr)	7440-47-3	9
Iron	7439-89-6	<1
Nickel (metal)	7440-02-0	2
Mineral silicates	1332-58-7	1
Niobium alloys (as Nb)	7440-03-1	-
Molybdenum alloys (as Mo)	7439-98-7	1
Zirconium alloys and compounds (as Zr)	12004-83-0	3
Manganese and/or manganese alloys and compounds (as Mn)	7439-96-5	1
Aluminium oxide and/or Bauxite	1344-28-1	-
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	<1
Aluminum and/or aluminum alloys (as Al)	7429-90-5	<1
Fluorides (as F)	7789-75-5	<1
Quartz	14808-60-7	2
Bismuth Metal and compounds (as Bi)	7440-69-9	<1
Lithium compounds (as Li)	544-13-2	<1
Stainless steel tube		75

Nominal tube composition	CAS No.,	Wt.%
Chromium	7440-47-3	20
Nickel	7440-02-0	14
Manganese	7439-96-5	2
Molybdenum	7439-98-7	3
Iron	7439-89-6	bal.

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.

Ingredients:	CAS No.	ACGIH TLV (mg/m^3)	OSHA PEL[4] (mg/m^3)
Titanium Dioxides	13463-67-7	10	15
Chromium and chromium alloys or compounds (as Cr)[3]	7440-47-3	0.5[b]	1.0[b]
Iron	7439-89-6	10[1]	10[1]
Nickel (metal)	7440-02-0	1.5	1
Mineral Silicates	1332-58-7	5[2]	5[2]
Niobium alloys (as Nb)	7440-03-1	NE[c]	NE[c]
Molybdenum alloys (as Mo)	7439-98-7	10	15
Zirconium alloys and compounds (as Zr)	12004-83-0	5	5
Manganese and/or manganese alloys and compounds (as Mn)[3]	7439-96-6	0.2	5.0[a]
Aluminium oxide and/or Bauxite	1344-28-1	10	15
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	10[1]	15[1]
Aluminum and/or aluminum alloys (as Al)	7429-90-5	10	15
Fluorides (as F)	7789-75-5	2.5	2.5
Quartz	14808-60-7	0.05[2] [4]	0.1[2] [4]
Bismuth metal and compounds (as Bi)	7440-69-9	10[1]	15[1]
Lithium compounds (as Li)	544-13-2	10[1]	15[1]

Nominal tube composition	CAS No.	ACGIH TLV (mg/m^3)	OSHA PEL[4] (mg/m^3)
Chromium[3]	7440-47-3	0.5[b]	1.0[b]
Nickel[3]	7440-02-0	1.5	1
Manganese[3]	7439-96-5	0.2	5.0[a]
Molybdenum	7439-98-7	10	15
Iron	7439-89-6	10[1]	10[1]

Supplemental Information:
(1) Not listed. The OSHA nuisance value maximum is 15 milligrams per cubic meter. PEL value for iron oxide is 10 milligrams per cubic meter. ACGIH TLV value for iron oxide is 5 milligrams per cubic meter.
(2) As respirable dust.
(3) Subject to the reporting requirements of Sections 311, 312 and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.
(4) Unless noted, all values are for 8 hour time weighted averages (TWA).

(a) Value is for manganese fume. Present PEL is 5 milligrams per cubic meter (ceiling value). Values proposed by OSHA in 1989 were 1.0 milligrams per cubic meter TWA and 3.0 milligrams per cubic meter STEL (Short Term Exposure Limit).
(b) The OSHA PEL for chromium (VI) is 5 micrograms (0.005 milligrams) per cubic meter. The TLV for water soluble chromium (VI) is 0.05 milligrams per cubic meter and the TLV for insoluble chromium (VI) is 0.01 milligrams per cubic meter
(c) Not established.

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: 1535ºC (2795ºF).
Boiling point: 3000ºC (5432ºF).
Evaporation rate (nBuAc = 1): Not applicable.
Vapor pressure, mmHg @ 20ºC: 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.

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).

Potential carcinogen evaluation among organization

Ingredients:	CAS No.	NTP(1)	IARC(2)	OSHA(3)
Titanium Dioxides	13463-67-7	--	2B	--
Chromium and chromium alloys or compounds (as Cr)(3)	7440-47-3	--	--	--
Iron	7439-89-6	--	--	--
Nickel (metal)	7440-02-0	S	2B	--
Mineral Silicates	1332-58-7	K	1	--
Niobium alloys (as Nb)	7440-03-1	--	--	--
Molybdenum alloys (as Mo)	7439-98-7	--	--	--
Zirconium alloys and compounds (as Zr)	12004-83-0	--	--	--
Manganese and/or manganese alloys and compounds (as Mn)(3)	7439-96-6	--	--	--
Aluminum oxide and/or Bauxite	1344-28-1	--	--	--
Silicon and/or silicon alloys and compounds (as Si)	7440-21-3	--	--	--
Aluminum and/or aluminum alloys (as Al)	7429-90-5	--	--	--
Fluorides (as F)	7789-75-5	--	--	--
Quartz	14808-60-7	K	1	--
Bismuth metal and compounds (as Bi)	7440-69-9	--	--	--
Lithium compounds (as Li)	544-13-2	--	--	--
Nominal tube composition	CAS No.	NTP(1)	IARC(2)	OSHA(3)
Chromium(3)	7440-47-3	--	--	--

Nickel[3]	7440-02-0	S	2B	--
Manganese[3]	7439-96-5	--	--	--
Molybdenum	7439-98-7	--	--	--
Iron	7439-89-6	--	--	--

(1) NTP (National Toxicology Program, USA) : K – Known Carcinogen, S – Suspect Carcinogen
(2) IARC (The International Agency for Research on Cancer) : 1 – Carcinogenic to humans, 2A – Probably carcinogenic to humans, 2B – Possibly carcinogenic to humans
(3) OSHA (Occupational Safety & Health Administration, USA) : Carcinogen list

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.