

MATERIAL SAFETY DATA SHEET

Updated November 2011

Section 1 - Product Identification

Product Name: STAINLESS STEEL WELDING WIRE

This MSDS covers all stainless steel welding wire products manufactured by National-Standard at the following location:

 1631 Lake Street
 Niles, MI 49120
 (269) 683-8100

Section 1-A - Trade Name and Nominal Composition

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

Product Name	Cr ¹	Mn	Ni ¹	Mo	Fe	Cu
NS-308L	20.4	1.8	9.9		67.9	
NS-308LHS	20.2	1.6	10.1		68.1	
NS-309L	23.2	1.8	13.8		61.2	
NS-309LHS	23.4	1.6	13.7		61.3	
NS-316L	19.0	1.7	12.4	2.0	65.5	
NS-316LHS	18.6	1.8	13.0	2.1	65.7	
NS-347	19.3	1.7	9.5		69.5	

Product Name	Cr ¹	Mn	Ni ¹	Mo	Fe	Cu
NS-347AMS	19.5	1.8	9.5		70.5	
NS-409Cb	11.4		0.5		88.6	
NS-430	17.8		0.5		82.2	
NS-430L	17.8		0.5		82.2	
NS-430LCb	17.7		0.4		80.1	
NS-439Ti	17.4				82.6	
NS-17-4PH	16.4		4.8		75.4	3.4
NS-18Cb	18.3				81.7	

Section 2 - Hazardous Ingredients

This section covers the materials contained in the product as shipped.

The fumes and gases produced during welding are covered in Section 10.

IMPORTANT

Ingredient	CAS No.	PEL ²	TLV ³	REL ⁴	STEL ⁵	IDLH ⁶
Chromium (Cr)	7440-47-3	1.0	0.5	0.5		25
Copper Dust (as Cu)	7440-50-8	1.0	0.2	1.0		100
Iron Oxide Dust (as Fe)	1309-37-1	10.0	10.0	5.0		2500
Manganese (Mn)	7439-96-5	(C)5.0 ⁷	0.2	1.0	3.0	500
Molybdenum (Mo)	7439-98-7	5.0	10.0			1000
Nickel (Ni)	7440-02-0	1.0	1.5	0.015		10

 Note: All values are in mg/m³

Section 3 - Hazard ID and Emergency Overview

SHORT-TERM (ACUTE) EXPOSURE: Acute overexposure to welding fumes may result in symptoms like metallic taste; nausea; dizziness; tightness of chest; fever; irritation of eyes, nose, throat and skin; loss of consciousness/death due to welding gases or lack of oxygen. Metal Fume Fever is characterized by chills, fever, vomiting, irritation of throat, upset stomach, and body aches and siderosis.

LONG-TERM (CHRONIC) EXPOSURE: Chronic overexposure to welding fume, gases, or dusts may cause permanent health effects. These effects may include skin sensitization, neurological damage, and respiratory disease such as bronchial asthma, lung fibrosis or pneumoconiosis. Prolonged inhalation of Nickel and Chromium compounds above exposure limits can cause cancer. Nickel and Nickel compounds are on the International Agency for Research on Cancer (IARC) and the National Toxicology Program (NTP) lists as posing a possible carcinogenic risk to humans. Hexavalent Chromium is listed as a known human carcinogen by IARC and NTP. Welding Fumes are listed by IARC as possibly carcinogenic to humans. Overexposure to Manganese above 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 gate.

EXPOSURE LIMITS: The ACGIH recommended exposure limit for total welding fumes is 5mg/m³. When this product is used for its intended purpose specific fumes (Copper, Chromium, Manganese, Nickel, and others) are produced. The Threshold Limit Value (TLV) of these materials may be exceeded b OSHA requires employers to before reaching the recommended maximum exposure for welding fumes. OSHA requires employers to ensure exposures below individual constituent PEL's (See Section 10). Determine actual exposures by industrial hygiene monitoring.

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Section 4 - First Aid Measures

EMERGENCY AND FIRST AID: Remove from exposure and obtain prompt medical attention. If victim is unconscious, administer oxygen. If not breathing, resuscitate immediately. If flu-like symptoms (cough, muscle pain, fever, chills, insomnia, or mental confusion) develop after use, obtain medical help immediately.

Section 5 - Fire and Explosion Hazard Data

Flammability: 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.

Section 6 - Spill or Leak Procedure

Spill of Leak Procedure: Not Applicable

Section 7 - Handling and Storage

Precautions: None.

Section 8 - Exposure Controls & Personal

VENTILATION: Use enough ventilation and/or local exhaust to keep fumes and gasses from your breathing zone and below all published exposure limits (See Section 10). Train the welder to keep his head out of the fumes.

RESPIRATORY PROTECTION: Use air-purifying fume respirator or air-supplied respirator when welding in confined space or where local exhaust or ventilation is not sufficient to keep exposure below all published exposure limits (See Section 10). Use special care when welding painted or coated steels since hazardous substances from the coating may be emitted.

EYE PROTECTION: Wear welding helmet or use face shield with filter lens, Shade No. 10 or darker. Provide protective screens or flash goggles if necessary to shield others.

Electric Shock: Electrical arc can cause serious burns or death. Do not touch welding wire (Rod) while welding. Do not touch live electrical parts. Make sure equipment is properly grounded. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

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, and shoulder protection as well as dark, substantial clothing.

Section 9 - Physical and Chemical Properties

Welding wire is a solid metal, shaped as wire of various diameters. No other physical properties apply.

Section 10 - Stability & Reactivity Information

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

Stability Condition to Avoid: None

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.

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Welding Fume & Gases By-product Exposure Limits						
Ingredient	CAS No.	PEL ²	TLV ³	REL ⁴	STEL ⁵	IDLH ⁶
Carbon Monoxide (CO)	630-08-0	55	28.6	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	0.1	0.2	0.1		100
Fluorides (F)		2.5	2.5			
Hexavalent Chromium ¹ (Cr VI)	1333-82-0	0.005	0.5	0.5		25
Iron Oxide Fume (as Fe ₂ O ₃)	1309-37-1	10.0	5.0	5.0		2500
Manganese Fume (Mn)	7439-96-5	(C) 5.0 ⁷	0.2	1.0	3.0	500
Molybdenum (Soluble) (Mo)	7439-98-7	5.0	10.0			1000
Nickel Metal (Ni)	7440-02-0	1.0	1.5	0.015		10
Nitrogen Dioxides (as NO ₂)	10102-44-0	(C) 9.0 ⁷	5.6	1.8		37.6
Ozone (O ₃)	10028-15-6	0.2	0.4	(C) 0.2 ⁷		9.8
Phosgene ³ (COCl ₂)	75-44-5	0.4	0.4	0.4	0.8	8.1

Note: All values are in mg/m³.

Section 11 - Toxicological Information

Toxicological Information: There is *limited evidence* in humans for the carcinogenicity of welding fumes and gases. Hexavalent Chromium (Cr VI) is listed as Class 1 human carcinogens by IARC. IARC identifies Welding Fumes, Nickel (Ni), Nickel Compounds, and as Group 2B possible human carcinogens.



Canadian WHMIS Class D, Division 2b Toxic

Section 12 - Ecological Information

Ecological Information: Not Applicable

Section 13 - Disposal Considerations

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

Section 14 - Transportation Information

Proper Shipping Name: Not regulated by DOT, IMO, or IATA.

Section 15 - Regulatory Information

SARA Title III: Not SARA Title III: The following metallic compounds are listed as SARA 313 Toxic Chemicals and depending on your usage may be subject to annual reporting: Chromium, Copper, Manganese, and Nickel.

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 § 25249.5 et seq.).

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Section 16 - Other Information

MSDS NOTES:

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

Approved By: Ronald F. Spears, Jr., CHMM, Mgr., EHS&S **Date:** November 23, 2011

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