

# Material Safety Data Sheet

## Updated – November 2008

### Section 1 - Product Identification

**Product Name:** CARBON STEEL WELDING WIRE

This MSDS covers all Carbon Steel Welding Wire products manufactured or distributed by National Standard at the following location:  
 1631 Lake Street  
 Niles, MI 49120  
 (269) 683-8100

### Section 1-A - Trade Name and Nominal Composition

Includes NS Copper-Coated, CopperFree®, and Airgas P3 products. All materials listed below have a Wt. % of 1% or greater.

<u>Product Name</u>	<u>Si</u>	<u>Mn</u>	<u>Fe</u>	<u>Product Name</u>	<u>Si</u>	<u>Mn</u>	<u>Fe</u>
ER70S-3		1.1	98.9	NS-101		1.1	98.9
ER70S-4		1.25	98.85	NS-105		1.25	98.85
ER70S-6	1.0	1.7	97.3	NS-115	1.0	1.7	97.3
ER70S-7		1.6	97.4	NS-116		1.6	97.4
ER80S-D2		1.8	98.2	NS-102		1.8	98.2

### 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

<u>Ingredient</u>	<u>CAS No.</u>	<u>PEL</u> <sup>1</sup>	<u>TLV</u> <sup>2</sup>	<u>REL</u> <sup>3</sup>	<u>STEL</u> <sup>4</sup>	<u>IDLH</u> <sup>5</sup>
Chromium (Cr)	7440-47-3	1.0	0.5	0.5		25
Copper Dust (as Cu)	7440-50-8	1.0	1.0	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 <sup>6</sup>	0.2	1.0	3.0	500
Nickel (Ni)	7440-02-0	1.0	1.5	0.015		10
Silicon (Si)	7440-21-3	5.0 <sup>7</sup>	5.0	5.0		

**Note:** All values are in mg/m<sup>3</sup>

### Section 3 - Hazard ID and Emergency Overview

**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, 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.

**EXPOSURE LIMITS:** The ACGIH recommended exposure limit for total welding fumes is 5mg/m<sup>3</sup>. OSHA requires employers to ensure exposures below individual constituent PEL's (See Section 10). Determine actual exposure by industrial hygiene monitoring.

### 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.

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### **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**

Read and understand the manufacturer's instructions and the precautionary label on this product. See American National Standard Z49.1:1999, *Safety in Welding, Cutting and Allied Processes* published by the American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126 ([www.aws.org](http://www.aws.org)); 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](http://www.osha.gov)).

**VENTILATION:** Use enough ventilation and/or local exhaust to keep fumes and gasses from you breathing zone and below all published exposure limits (See Section 10). To avoid exposure to metal fumes additional ventilation may be needed when welding on coated metals, such as painted, galvanized, or plated parts. Proper use of an appropriate respirator may be necessary when welding in a confined space, or if ventilation is inadequate. 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 does not keep exposure below PEL, TLV, REL and STEL levels.

**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.

**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. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

### **Section 9 - Physical and Chemical Properties**

Welding wire is a solid metal, shaped as wire of various diameters, which may be gray or copper colored.

**Density:** 489.6 lbs/ft<sup>3</sup>

**Melting Point:** 2700 °F

### **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 and Chromium compounds. Ozone is formed during most electric arc welding, and exposures can be high in comparison to the exposure limit, particularly during 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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The following exposure limits apply to those fumes and gases which may be found in the welding environment:

<b>Ingredient</b>	<b>CAS No.</b>	<b>PEL<sup>1</sup></b>	<b>TLV<sup>2</sup></b>	<b>REL<sup>3</sup></b>	<b>STEL<sup>4</sup></b>	<b>IDLH<sup>5</sup></b>
Carbon Monoxide (CO)	630-08-0	55	28.6	40		1380
Chromium II (as Cr)		0.5	0.5	0.5		250
Chromium III (as Cr)		0.5	0.5	0.5		25
Chromium VI (as Cr)		0,005	0.05	0.001	(C) 0.1 <sup>6</sup>	
Copper Fume (as CuO)	1317-38-0	0.1	0.2	0.1		100
Fluorides (F)		2.5	2.5			
Iron Oxide Fume (as Fe <sub>2</sub> O <sub>3</sub> )	1309-37-1	10.0	5.0	5.0		2500
Manganese Fume (Mn)	7439-96-5	(C) 5.0 <sup>6</sup>	0.2	1.0	3.0	500
Nickel Metal (Ni)	7440-02-0	1.0	1.5	0.015		10
Nitrogen Dioxides (as NO <sub>2</sub> )	10102-44-0	(C) 9.0 <sup>6</sup>	5.6	1.8		37.6
Ozone (O <sub>3</sub> )	10028-15-6	0.2	0.4	(C) 0.2 <sup>6</sup>		9.8
Phosgene <sup>3</sup> (COCl <sub>2</sub> )	75-44-5	0.4	0.4	0.4	(C) 0.8 <sup>6</sup>	8.1

**Note:** All values are in mg/m<sup>3</sup>.

### **Section 11 - Toxicological Information**

**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).

### **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 manor, in full compliance with federal state and local regulations.

### **Section 14 - MSDS Transportation Information**

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

### **Section 15 - Regulatory Information**

**EPCRA:** Copper, Chromium, Manganese, and Nickel are regulated under EPCRA Section 313. Copper and Chromium have a CERCLA RQ of 5,000lbs. Nickel has a CERCLA RQ of 100 lbs.

**TSCA:** All materials contained within this product are on the TSCA Inventory List.

**Clean Air Act:** Large users or facilities subject to Title V requirements may need to add their welding fume emissions to their annual emissions inventory, using the material percentages listed in Section 1A.

### **Section 16 - Other Information**

#### **MSDS NOTES:**

- (1) Permissible Exposure Limit (PEL) - 8-hour TWA exposure as defined by OSHA (29CFR1910).
- (2) Threshold Limit Value (TLV) - 8-hour TWA as defined by American Conference of Governmental Industrial Hygienists (ACGIH).
- (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.
- (7) The listed value for Respirable Dust versus Total Dust

**Approved By:** Brian J. McGuire, Corporate EH&S Manager **Date:** November 21, 2008

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This data is believed to be accurate and was obtained from recognized technical sources, but cannot be warranted as to its accuracy or sufficiency. See [www.heicowiregroup.com](http://www.heicowiregroup.com) for most recent MSDS.