



Hyndman Industrial Products, Inc.  
3508 Independence Drive  
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Phone 260.483.6042  
Fax 260.483.1722  
sales@resistancewire.com

February 3, 2010

Dear Hyndman Industrial Products Customer:

The enclosed Material Safety Data Sheets (MSDS) are provided pursuant to requirements promulgated within the Occupational Safety and Health Administration's (OSHA) Hazard Communications Standard, 29 CFR 1910.1200, et. seq., and applies to the following products of Hyndman Industrial Products, Inc.:

NICKEL-CHROMIUM-IRON (Ni-Cr-Fe) ALLOYS IN WIRE, COIL, OR OTHER FORM  
IRON-CHROMIUM-ALUMINUM (Fe-Cr-Al) ALLOYS IN WIRE, COIL, OR OTHER FORM  
COPPER-NICKEL (Cu-Ni) ALLOYS IN WIRE, COIL, OR OTHER FORM

The Standard sets forth a variety of reporting and training requirements and states that each qualifying employer "shall maintain copies of the required Material Safety Data Sheets . . . and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s)."

In furtherance of our combined obligations under this Standard, Hyndman Industrial Products urges its customer to note the receipt of those products indicated on the enclosed MSDS. Subsequent shipments of the above-referenced products shall be identified with the following warning:

#### **WARNING**

Inhalation of fumes, gases, or dust generated by burning, grinding, or welding this product may be hazardous to your health. This product contains nickel and/or chromium, which are deemed to be potential carcinogens by OSHA (29 CFR 1910.1200). Lung or neurological damage may occur as well as other health problems. **IMPORTANT:** Read the appropriate Material Safety Data Sheet before using this product.

Thank you in advance for your attention to this matter as well as your continued patronage of Hyndman Industrial Products, Inc. Should you have any questions regarding the enclosed information, please do not hesitate to contact the undersigned.

Sincerely,

A handwritten signature in black ink, appearing to read "Joseph E. Hyndman", written over a horizontal line.

Joseph E. Hyndman, President  
Hyndman Industrial Products, Inc.



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**MATERIAL SAFETY DATA SHEET**  
**NICKEL-CHROMIUM-IRON (Ni-Cr-Fe) ALLOYS IN WIRE, COIL, OR OTHER FORM**  
**IRON-CHROMIUM-ALUMINUM (Fe-Cr-Al) ALLOYS IN WIRE, COIL, OR OTHER FORM**  
**COPPER-NICKEL (Cu-Ni) ALLOYS IN WIRE, COIL, OR OTHER FORM**

**MANUFACTURER:**  
 Hyndman Industrial Products, Inc.  
 3508 Independence Drive  
 Fort Wayne, IN 46808  
 (260) 483-6042

MSDS NO.: HDS001  
 REVISION DATE: 02-03-10

**SECTION I – PRODUCT TYPE**

This MSDS is for round and flat wire products commonly fabricated by mechanical means such as bending, coiling, stranding, braiding, weaving, etc. It is not intended for welding wire. In the solid form, this product is not hazardous. However, caution must be exercised when burning, grinding, or welding. Consult the following sections for specific details.

**SECTION II – COMPOSITION<sup>1</sup>**

<b>COMPONENT</b>		<b>CAS NO.</b>	<b>COMPONENT</b>		<b>CAS NO.</b>
Aluminum	(Al)	7429-90-5	Iron	(Fe)	7439-89-6
Chromium	(Cr)	7440-47-3	Manganese	(Mn)	7439-96-5
Cobalt	(Co)	7440-48-7	Molybdenum	(Mo)	7439-98-7
Copper	(Cu)	7440-50-8	Nickel	(Ni)	7440-02-0

**SECTION III – HAZARDOUS COMPONENTS<sup>1</sup>**

**IMPORTANT** – This section lists hazardous components contained in the as shipped products.

<b>COMPONENT</b>	<b>PEL<sup>2</sup></b>	<b>TLV-TWA<sup>3</sup></b>	<b>COMPONENT</b>	<b>PEL<sup>2</sup></b>	<b>TLV-TWA<sup>3</sup></b>
Aluminum	None	10	Iron	C5	C5
Chromium	1	0.5	Manganese	15	10
Cobalt	0.1	0.05	Molybdenum	1	1
Copper	1	1	Nickel	None	5

(C—Ceiling limit)

<sup>1</sup>Composition of Hazardous Components (as defined by OSHA-29CFR 19.10.1200)—1% by weight or greater, except 0.1 for nickel and chromium.

<sup>2</sup>Permissible Exposure Limits (mg/m<sup>3</sup>) OSHA (29CFR 1910).

<sup>3</sup>Threshold Limit Value—Time Weighted Average (mg/m<sup>3</sup>) = AMERICAN CONFERENCE OF GOVERNMENTAL HYGIENISTS (ACGIH).

**SECTION IV – PHYSICAL DATA**

Round and Flat wire is solid metal.

**SECTION V – FIRE AND EXPLOSION DATA**

Nonflammable; however, sparks can ignite flammables and combustibles.



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### SECTION VI – REACTIVITY DATA

If this wire is welded, the fume and gas decomposition products generated are different in form from the components listed in Section III. The gases and fumes that may form during welding or burning and their exposure limits are noted in the following table:

COMPONENT	PEL	TLV-TWA
Aluminum Fume	None	5.0
Carbon Monoxide	50 ppm	50 PPM
Chromium (Chromates)	0.1	0.05
Cobalt Fume (Co)	0.1	0.05
Copper Fume (Cu)	0.1	0.2
Iron Oxide Fume (As Fe)	10.0	5.0
Manganese Fume (Mn)	C5.0	1.0
Molybdenum (Mo) (Soluble)	5.0	5.0
Nickel (Ni) (Soluble)	1.0	0.1
Nitrogen Dioxides	C5.0 PPM	3.0 PPM
Ozone	0.1 PPM	0.1 PPM
Phosgene	0.1 PPM	0.1 PPM

(PEL—TLV-TWA values are mg/m<sup>3</sup> except PPM)

(C—ceiling limit)

The recommended (ACGIH) limit for welding fumes not otherwise classified is 5 mg/m<sup>3</sup>. Some nuisance particulates, as silicon, have a TLV-TWA of 5mg/m<sup>3</sup> as respirable dust (ACGIH Appendix D).

### SECTION VII – HEALTH HAZARD DATA

Dust, Fumes, and gases can be dangerous to your health. Sections II, III, and IV list specific hazardous components, reaction products, and OSHA recommend PEL's and ACHIH TLV's. Some workers may experience discomfort at concentrations below the threshold limit values and others may be affected by a pre-existing condition or other occupational illness because of the wide variation in individual susceptibilities. Fumes, gases, and dust can be a health hazard thru inhalation. Short-term exposure to welding fumes, gases, and dust may result in discomfort such as dizziness, nausea, fever, dryness and/or irritation of nose, throat, and eyes. Skin sensitivity may also be noted. Acute exposure can result in the same symptoms except to a greater degree as well as watery eyes, headache, breathing difficulty, frequent coughing and/or chest pains. Some toxic gases may cause pulmonary edema or asphyxiation and excessive exposure can be fatal. Chronic exposure may result in neurological damage, lung fibrosis, pneumoconiosis and other lung diseases. Nickel and Chromium are considered possible carcinogens under OSHA (29 CFR 1910.1200). There is considerable controversy on the extent of the respiratory cancer problem due to Nickel and Chromium. Nevertheless, exposures must be maintained below the levels specified in Sections II, III, and IV.

### EMERGENCY AND FIRST AID

Remove from exposure area and call for medical aid. Administer oxygen if breathing is difficult. If not breathing, begin artificial respiration. If no detectable pulse, begin external heart massage. Employ first aid techniques recommended by the American Red Cross. In case of electrical shock, turn off power prior to removal from exposure area and administration of first aid.

### SECTION VIII – PRECAUTIONS FOR SAFE HANDLING AND USE

#### VENTILATION

Use enough ventilation when burning, grinding or welding to keep the dust, fumes, and gases from the workers breathing zone and general area. Keep exposure below the limits specified in Sections II, III, and IV.



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### **RESPIRATORY PROTECTION**

Use weld fume respirator or air supplied respirator when burning, grinding, or welding in a confined space or where local exhaust or general ventilation does not keep exposure below recommended limits. Monitor the air quality inside the welder's helmet, if worn, and/or the worker's breathing zone to determine if a respirator is required and the type needed. Use only NIOSH approved respirators.

### **EYE PROTECTION**

Use OSHA approved goggles, glasses and/or face shield when burning, grinding, or welding. In addition, when burning or welding, wear welding helmet or face shield with filter lens. Select welding lens shade from American Welding Society (AWS) publication F2.2

### **PROTECTIVE CLOTHING**

Wear gloves and flame retardant clothing when burning, grinding or welding. Do not expose skin to radiation when burning or welding. Provide protective screens to shield others.

### **SPILLS, LEAKS, AND WASTE DISPOSAL**

Clean up any grinding dust or waste residues and place in suitable Department of Transportation (DOT) approved containers and dispose of in full compliance with federal, state, and local regulations. Avoid inhalation and skin exposure.

### **DISCLAIMER OF LIABILITY**

As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this material. Information contained herein is believed to be true and accurate, but all statements or suggestion are made without any warranty, express or implied, regarding accuracy of the information, the hazards connected with the use of the material, or the results to be obtained from use thereof.

Refer to the following sources for additional important information:

[ANSI Z49.1](#)

"SAFETY IN WELDING AND CUTTING AND ALLIED PROCESSES" (AWS Z49.1)"

The American Welding Society  
550 N.W. LeJeune Road  
Miami, Florida 33126  
[www.aws.org](http://www.aws.org)

[OSHA \(29 CFR 1910.1200\)](#)

[Hazard Health Definitions - Appendix A](#)  
[Hazard Determination - Appendix B](#)  
[Guidelines for Employer Compliance - Appendix E](#)

U.S. Department of Labor  
Washington, D.C. 20210  
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