



# MATERIAL SAFETY DATA SHEET

## NICKEL AND NICKEL ALLOY COATED ELECTRODES

### SECTION 1 - MATERIAL IDENTIFICATION

Manufacturers Name **J. W. Harris Co., Inc.**      Distributor Name (If Applicable) \_\_\_\_\_

Address **10930 Deerfield Road**

Address **Cincinnati, Ohio 45242**

Emergency Telephone **(513) 891-2000**

MSDS Date **November 1985**

The following table lists the trade name and composition of products covered by this Material Safety Data Sheet. **See section 2 and especially section 6 for important health hazard data.**

Trade Name	Nominal Chemical Composition													
	C	Mn	Fe	S	Si	Cu	Cr	Cb	Mo	Ni	Al	Ti	Co	W
Harris "A" electrode	0.10	2.25	9.00	0.02	0.75	0.50	15.0	2.0	1.50	Rem				
1320 Electrode	0.08	1.5	11.0	0.015	0.75	0.50	15.0	2.75		68.0				
1350 Electrode	0.08	1.88	Rem	0.03	0.75	1.75	28.5		3.65	37.5				
1410 Electrode	0.10	0.75	0.02	1.25	0.25						1.0	2.5		
1820 Electrode	0.10	7.75	8.0	0.015	1.0	0.50	15.0	1.75				1.0	0.12	
1870 Electrode	0.05	1.75	0.58	0.025	0.50	Rem				31.0	1.0	0.50		
1900 Electrode	0.15	4.0	2.5	0.015	1.0	Rem				65.0	0.75	1.0	0.02	
C-276 Electrode	0.02	1.0	5		0.08		15.5		16	57.0			2.5	4
Alloy G Electrode	0.05	1.5	19.5		1.0		22		6.5	43			2.5	1.0
Alloy B, B2 Electrode	0.02	1.0	2.0		0.10		1.0		28	69			1.0	
Alloy X Electrode	0.10	1.0	18.5		1.0		22		9	47			1.5	0.60
Alloy W Electrode	0.12	1.0	6		1.0		5		24	63			2.5	
Nickel 55 Electrode	1.5	0.3	44.5	0.005	0.5	0.1				53.0				
Nickel 99 Electrode	1.00	0.3	3.00	0.005	0.5	0.1				95.0				

### SECTION 2 - HAZARDOUS MATERIALS

Welding electrodes are a nonhazardous solid at ambient temperature. Hazards (as defined by OSHA 29CFR 1910.1200) may result from fume generated during welding. Section 1 lists product designations and composition as manufactured. **IMPORTANT** - See Section 6 for information on potential fume hazard resulting from use of the product.

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### SECTION 3 - PHYSICAL DATA

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Solid wire or rod.

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### SECTION 4 - FIRE AND EXPLOSION DATA

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Nonflammable. Welding arc, open flame and sparks can ignite combustibles, See ANSI/ASC Z49.1-1983 Section 6.

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### SECTION 5 - HEALTH HAZARD DATA

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**Exposure** - Section 1 lists nominal composition of Nickel Coated Electrodes. Section 6 lists exposure limits for hazardous decomposition products which might be present in fume generated during welding or brazing. Actual exposure should be determined by monitoring the fume in the operator's breathing zone.

**Primary Route of Exposure** - Inhalation of fume.

**Pre-Existing Medical Conditions** - Individuals with impaired pulmonary functions or illness may have symptoms exacerbated by fume irritants.

**Possible Effects of Exposure** - Short term exposure to welding fume may result in discomfort, dizziness, nausea, or dryness or irritation of the throat. Long term exposure to welding fume, gases or dust may contribute to pulmonary irritation or pneumoconiosis. Copper fume may cause metal fume fever. Short term symptoms may include a metallic taste in the mouth, dryness or irritation of the throat followed by coughing, shortness of breath, nausea fever, body ache, and chills. Nickel and chromium should be considered possible carcinogens per OSHA 29CFR 1910.1200. Certain nickel compounds have been implicated based on experience in some nickel refining operations. The specific compounds, however, have not been determined and a direct association between nickel in welding fume and cancer has not been demonstrated. Some compounds of hexavalent chromium have been reported to be carcinogenic. No clear association, however, has been established between chromium in welding fume and the development of cancer. Exposure limits should be maintained below the levels listed in Section 6.

**Emergency First Aid** - Remove from dust or fume exposure. If breathing has stopped perform artificial respiration. Summon medical aid immediately.

#### **Other Health Considerations**

**Arc Rays** - From electric arc welding operations can injure eyes and burn skin.

**Electric Shock** - From arc welding equipment can kill.

**Heat Rays** - Infrared radiation from flame or hot metal can injure eyes.

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### SECTION 6 - REACTIVITY DATA

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#### **Hazardous Decomposition Products**

Welding and brazing fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being brazed or welded, the process, procedures, and filler metals used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the operator's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities). When the filler metal is consumed, the fume and gas decomposition products generated are different in percent and form from the solid wire or rod ingredients listed in Section 1. Fume and gas decomposition products, and not the ingredients in the electrode or wire are important. The concentration of a given fume or gas component may decrease or increase by many times the original concentration in the electrode. Also, new compounds not in the electrode or wire may form. Decomposition products of normal operation include those originating from the base metal and coating, etc., as noted above.

Section 1 lists composition of the stainless steel wire or electrode. The chart below lists those constituents, defined as hazardous, which are likely to be present in the welding fume.

#### Core Wire

Element	CAS#	PEL mg/m <sup>3</sup> (1)	TLV mg/m <sup>3</sup> (2)
Manganese (fume)	7439-96-5	5.0 (ceiling)	1.0
Iron (oxide fume) Fe <sub>2</sub> O <sub>3</sub>	1309-37-1	10.0	5.0
Silicon (SiO <sub>2</sub> amorphous - respirable)	60676-86-0	Not Listed	5mg/m <sup>3</sup> - Respirable dust 10mg/m <sup>3</sup> total dust
Copper (fume)	7440-50-8	0.1	0.2
Chromium (VI)	7440-47-3	0.1	0.05
Molybdenum (soluble)	7439-98-7	5.0	5.0
Nickel (soluble)	7440-02-0	1.0	0.1
Aluminum (welding fume)	7429-90-5	Not Listed	5.0
Titanium (dioxide)	13463-67-7	15.0	10mg/m <sup>3</sup> total dust or 5mg/m <sup>3</sup> respirable dust
Cobalt (dust & fume)	7440-48-4	0.1	0.05
Tungsten	7440-33-7	Not Listed	5.0

#### Flux Coating

Element	CAS#	PEL	TLV
Titanium Dioxide	13463-67-7	15.0	10.0
Calcium Carbonate	1317-65-3	5.0 (CaO)	10.0
Calcium Fluoride	14542-23-5	2.5 (F)	2.5 (F)
Cryolite	15096-52-3	2.5 (F)	2.5 (F)
Feldspar	68476-25-5	Not Listed	2.0
Chromium Oxide	1308-38-9	0.05 (CR VI)	0.05 (CR VI)
Potassium Silicate	1312-76-1	Not Listed	5.0
Sodium Silicate	1344-09-8	Not Listed	5.0
Potassium Hydroxide	1310-58-3	Not Listed	2.0

(1) Permissible exposure limit OSHA 1910 Subpart Z.

(2) Threshold limit value American Conference of Government Industrial Hygenists.

Gaseous reaction products such as carbon monoxide and carbon dioxide, ozone and nitrogen oxides may be formed by the radiation from the arc during electric arc welding.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample from inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1, available from the American Welding Society, P.O. Box 351040, Miami, Florida 33135.

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#### SECTION 7 - SPILL OR LEAK PROCEDURES

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Not Applicable.

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## SECTION 8 AND 9 - SPECIAL PROTECTION INFORMATION AND PRECAUTIONS

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Read and understand the manufacturer's instructions and the precautionary label on the product. See American National Standard Z49.1, *Safety in Welding and Cutting* published by the American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more detail on many of the following.

### **Ventilation**

Use enough ventilation, local exhaust at the arc to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the employee to keep his head out of the fumes. See ANSI/ASC Z49.1 Section 5.

### **Respiratory Protection**

Use respirable fume respirator or air supplied respirator when welding in a confined space or where local exhaust or ventilation does not keep exposure below TLV.

### **Eye Protection**

Wear helmet or use face shield with filter lens of appropriate shade number (see ANSI/ASC Z49.1 -Section 4.2). Provide protection screens and flash goggles, if necessary, to shield others.

### **Protective Clothing**

Wear head and body protection which help to prevent injury from radiation, sparks, flame, 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 employee not to touch live electrical parts and to insulate himself from work and ground.

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