1618 Terminal Rd.
Niles, MI 49120
616/683-8100

NATIONAL-STANDARD MATERIAL SAFETY DATA SHEET

N03-001

Date Revised: 6/01/90

CARBON AND STAINLESS WELDING PRODUCTS

Emergency Phone: 616/683-8100

SECTION 1 - Product Identification

This MSDS covers all Welding Products manufactured by National-Standard
Trade name and nominal composition is listed in Section 2-A

SECTION 2 - Hazardous Ingredients*

IMPORTANT

This section covers the materials contained in the product as shipped. The fumes and gases produced during welding are covered in Section 5.

Ingredient	CAS No.	PEL[1]	TLV[2]	Ingredient	CAS No.	PEL[1]	TLV[2]
Manganese (Mn)	7439-96-5	15.0	C5.0	Nickel (Ni)	7440-02-0	1.0	1.0
Silicon (Si)	7440-21-3	None	10.0	Copper (Cu)	7440-50-8	0.1	0.2
Chromium (Cr)	7440-47-3	1.0	0.5	Molybdenum (Mo)	7439-98-7	5.0	5.0
				Iron (Fe)	7439-89-6	10.0	

SECTION 2-A - Tradename and Nominal Composition

Wt. % - 1% or greater
NI & Cr 0.1% or greater

Product Name	Si	Carcinogens Cr	Mn	Carcinogens Ni	Mo	Fe	Cu
ER70S-3 Cu Ctd.			1.11			98	
NS-101			1.11			98	
NS-102			1.79			97	
NS-103			1.14			98	
NS-104			1.20			98	
NS-115	1.02		1.71			97	
NS-116			1.64			97	
NS-308		20.2	1.80	9.8		67	
NS-308L		20.42	1.83	9.87		67	
NS-308LHS		20.23	1.56	10.1		67	
NS-308-HS		20.1	1.84	10.13		67	
NS-309		23.5	1.65	13.5		61	
NS-309L		23.27	1.78	13.8		60	
NS-309HS		23.63	1.80	13.83		60	
NS-309LHS		23.4	1.64	13.7		60	
NS-310		26.75	1.89	21.46		49	
NS-312		29.85	1.70	8.91		59	
NS-316		16.26	1.54	11.70	2.18	68	
NS-316L		18.43	1.68	12.4	2.04	65	
NS-316LHS		18.57	1.80	11.84	2.11	65	
NS-347		19.3	1.72	9.53		68	
NS-347AMS		18.58	1.51	9.36		69	
NS-363		11.59		3.82		84	
NS-409Cb		11.27				87	
NS-410		12.5				86	
NS-430		17.81				80	
NS 17-4		16.38		4.83		74	3.38
NS 18CrCb		18.25				80	

SECTION 3 - Physical Data

Welding products are solid metals shaped as wire of various diameters

SECTION 4 - Fire and Explosion Hazard Data

(Nonflammable) Welding arc and sparks can ignite combustibles. Refer to American National Standard Z49.1, Safety in Welding and Cutting, published by the American Welding Society, P.O. Box 351040, Miami, FL 33135, for fire prevention and protection information during the use of welding and allied procedures.

NOTES: *As defined by OSHA (29CFR1910.1200) or certain state regulations.

1. Permissible Exposure Limit - (mg/m^3)-OSHA (29CFR1910).
2. Threshold Limit Value - (mg/m^3)-American Conference of Governmental Industrial Hygienists (current as of MSDS revision date).

SECTION 5 - Health Hazard Information

EXPOSURE LIMITS: Section 2 lists specific hazardous ingredients and exposure limits. Section 6 lists exposure limits for hazardous reaction products that might be forming by welding. **IMPORTANT** - Determine actual exposure by industrial hygiene monitoring.

POSSIBLE SIGNS AND SYMPTOMS OF EXPOSURE TO DUST, WELDING FUME AND GASES

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 time 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. Nickel and chromium must be considered possible carcinogens under OSHA (29CFR1910.1200). The International Agency for Research on Cancer has indicated that nickel and certain nickel compounds are probably carcinogenic for humans, but that the specific compounds which may be carcinogenic cannot be specified precisely. This conclusion was based on experience in certain nickel refining operations. Chromium has also been listed by IARC because of "sufficient evidence for the carcinogenicity of chromium and certain chromium compounds." The studies forming the basis for the conclusion were from operations different from the production or welding of nickel and chromium alloys. Recent epidemiological studies of workers melting and working alloys containing nickel / chromium have found no increased risk of cancer. Nevertheless, exposures MUST be maintained below the levels specified in Section 2 and Section 6.

AGGRAVATION of preexisting respiratory or allergic conditions may occur in some workers.

EMERGENCY AND FIRST AID:
Remove from exposure and obtain prompt medical attention. If victim is unconscious, administer oxygen. If not breathing, resuscitate immediately.

SECTION 6 - Reactivity Information

HAZARDOUS REACTION PRODUCTS:
Fumes and gases from welding cannot be classified simply. The composition and quantity of both depend on the metal being welded, the process, procedures, and electrodes used. The constituents of the fume are generally different from the ingredients listed in Section 2 and may include oxides of the metals, chromates, fluorides, and complex metallics. The gases may include carbon monoxide, ozone, and oxides of nitrogen. Chlorinated solvents may be decomposed by the arc into toxic gases such as phosgene. The following exposure limits apply to those fumes and gases which may be found in the welding environment.

Substance	PEL	TLV	Substance	PEL	TLV
Carbon monoxide (CO)	50ppm	50ppm	Manganese fume (Mn)	C1.0	1.0
Chromium (Chromates)	0.1	0.05	Molybdenum (soluble)(Mo)	5.0	5.0
Cobalt fume (Co)	0.1	0.1	Nickel (soluble) (Ni)	1.0	0.1
Copper fume (Cu)	0.1	0.2	Nitrogen dioxides (NO_2)	C5.0ppm	3ppm
Fluorides (as F)	2.5	2.5	Ozone (O_3)	0.1ppm	0.1ppm
Iron oxide fume (as Fe)	10.0	5.0	Phosgene ($COCl_2$)	0.1ppm	0.1ppm

(PEL/TLV values are mg/m^3 except where indicated as ppm)

SECTION 7 - Spill or Leak Procedure

Not applicable

SECTION 8 and 9 - Special Protection Information and Precautions

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, DC 20402, for more detail on many of the following.

VENTILATION
Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.

RESPIRATORY PROTECTION
Use respirable fume respirator or air supplied respirator when welding in 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 shade number "10" or darker.
Provide protective screens and 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. 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 touch live electrical parts and to insulate himself from work and ground.

Approved By: _____ **Date:** _____