



MSDS Name	Maintenance Alloys
Revised	February 2005

MATERIAL SAFETY DATA SHEET (MSDS)

For Welding Consumables and Related products
Conforms to OSHA Hazard Communication Standard 29CFR 191.1200
Standard Must Be Consulted for Specific Requirements

Section I – Identification

Supplier: Universal Wire Works Inc.	Telephone Number: 713-649-3828
Address: 15 Drennan St, Houston, TX 77003	Emergency Number: 713-649-3828
Classification: 287FCO, 287G, 289	Specifications: No AWS Specification

Section II – Hazardous Materials*

IMPORTANT: This section covers the materials for which the product was manufactured. The fumes and gases produced during welding with the normal use of this product are covered.

*The term "Hazardous Materials" should be interpreted as a term required and defined in OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200); however, the use of this term does not necessarily imply the existence of any hazard.

Flux or other Ingredients	% Of Weight	CAS No.	Exposure Limit (mg/m ³)	
			OSHA PEL	ACGIH TLV
Chromium (Cr) *		7440-47-3	1.0	.5
Iron (Fe)		7439-89-6	NA	NA
Manganese (Mn) *		7439-96-5	5.0 as ceiling (dust) 1.3 Stel (fume)	0.2 for fume
Silicon (SiO ₂)		7440-21-3	5.0	3.0
Carbon (C)		7782-42-5	3.5	3.5
Vanadium (V) *		7440-62-2	.01 as fume	.05 as fume
Molybdenum (Mo)		7439-98-7	15.0	10.0
Nickel (Ni) *		7440-02-0	1.0	1.0
Tungsten (W)		7440-33-7	NA	1.0
Columbium		7440-03-1	5.0	5.0
Boron (B)		7440-42-8	NA	NA
Cobalt (Co) *		7440-48-4	0.1	.05

Chemicals listed in Section 313 of SARA Title III are identified with an asterisk (*). Oxides and/or fluorides of Aluminum, Barium, Calcium, Iron, Magnesium, Potassium, Silicon, Titanium, Zirconium (WARNING: This product contains or produces a chemical known to the State of California to cause cancer and birth defects (or reproductive harm. (California Health & Safety Code 25249.5 et seq.))

Section III – Physical

These products as shipped are non-hazardous, non-flammable, non-explosive and non-reactive.

Section IV – Fire and Explosion Hazard

Welding arc and sparks, and the use of oxy-fuel torches, can ignite combustibles and flammable. Refer to American National Standard Z49.1 for fire prevention during the use of welding and allied procedures.

Section V – Health Hazard Data

Use of this product in welding and brazing operations can result in exposure to airborne metal particulates and fumes. Section 2 lists specific hazardous ingredients and exposure limits. Section 6 lists exposure limits for hazardous reaction products that might be formed by welding and high temperature cutting.

IMPORTANT: Determine actual exposure by industrial monitoring.

Primary routes of exposure are inhalation of fumes, gases, or particulates. Absorption through the skin is unlikely.

Welding Fumes

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 chemicals listed in Table 6a have low PEL's/TLV's and represent potential health hazards. Postle Industries recommends monitoring of these chemicals.

Table 6a

Metal or Chemical	Exposure limit (mg/m ³)	
	ACGIH TLV	OSHA PEL
Carbon Monoxide	50 ppm	50 ppm
Chromium (Chromates)	0.05	.05 as CrVI
Chromium Oxides	0.5	0.5
Cobalt & Co Oxide	0.05	.1
Copper & Cu Oxide	0.2 for fume	0.1 for fume
Fluorides as fluorine	2.5	2.5
Manganese fume (Mn)	1.0	5.0 as ceiling
Nickel & Ni Oxide	1.0	1.0
Nitric Oxide	25 ppm	25 ppm
Nitrogen dioxides	3 ppm	5 ppm
Ozone	0.1 ppm	0.1 ppm
Phosgene	0.1 ppm	0.1 ppm

For virtually all welding electrodes, the ACGIH Welding Fumes – Total Particulate TLV of 5 mg/m³ will be exceeded well before the PEL or TLV for any individual chemical in the fume is exceeded. The welding fume may contain many of the chemicals listed in Table 6. They are not present in the pure form, but only as complex combinations with other ingredients and they will be below their individual PEL or TLV when total welding fume reaches 5 mg/m³

Metal or Chemical	CAS No.	Metal or Chemical	CAS No.
Aluminum	7429-90-5	Potassium oxide	12136-47-7
Aluminum oxide	1344-28-1	Silicon	7440-21-3
Boron	7440-42-8	Silicon oxide (amorphous)	7631-86-9
Boron oxide	1303-86-2	Sodium	7440-23-5
Columbium (Niobium)	7440-03-1	Sodium oxide	1313-59-3
Cb or Nb oxide	1313-96-8	Strontium	7440-24-6
Calcium	7440-70-2	Strontium oxide	1314-11-0
Calcium oxide	1305-78-8	Titanium	7440-32-6
Calcium fluoride	7789-75-5	Titanium oxide	13463-67-7
Lithium	7439-92-2	Tungsten	7440-33-7
Lithium oxide	12057-24-8	Tungsten oxide	39318-18-8
Magnesium	7439-5-4	Vanadium	7440-62-2
Magnesium oxide	1309-48-4	Vanadium oxide	1314-62-1
Molybdenum	7439-98-7	Welding fumes	Not specified
Molybdenum oxide	18868-43-4	Zirconium	7440-67-7
Potassium	7440-09-7	Zirconium oxide	1314-23-4

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

SHORT TERM EXPOSURE:

Metallic taste; nausea; vomiting, fatigue/drowsiness, dizziness, weakness, headache, tightness of chest; metal fume fever; coughing, irritation of eyes, irritation to mucous membranes, throat and skin; loss of consciousness or death due to welding gases and lack of oxygen. Welding fumes can also be a respiratory and pulmonary irritant.

LONG TERM EXPOSURE:

Adverse effects may result from long time exposure to welding fumes, gases, or dusts. These effects may include skin sensitization, neurological damage, and respiratory disease such as bronchial asthma, lung fibrosis or pneumoconiosis. Chronic exposure to copper, zinc and manganese may cause metal fume fever. Symptoms of metal fume fever include fever, fatigue, dryness of throat, head and body ache, chills. Chronic exposures may affect the central nervous system leading to emotional disturbances, gait and balance difficulties and paralysis. Overexposure to copper may result in skin and hair discoloration.

Nickel and chromium when present in welding electrodes are of special interest. The OSHA Hazard Communication Standard (29 CFR 1910.1200) deems them to be human carcinogens. They are on the IARC and NTP lists of suspect or proven carcinogens. Also, OSHA regards some Chromium VI compounds as carcinogenic. Certain chromium and nickel compounds have been clearly shown to be animal and human carcinogens, however these compounds have not been found in the welding fumes. Nevertheless, the welding fume should be monitored for chromium and nickel and exposures must be maintained below the levels specified in the Sections 2 and 6. Studies have shown the chromate production workers exposed to hexavalent chromium compounds have excess in lung cancer. Chromium (VI) compounds are more readily absorbed through the skin than chromium (III) compounds. Good practice requires the reduction of employee exposure to chromium (III) and (VI) compounds.

Aggravation of pre-existing respiratory or allergic conditions may occur in some workers.

FIRST AID:

Ingestion: Ingestion is unlikely. Seek medical help if large quantities of product are ingested

Inhalation: Remove from exposure and obtain medical attention. If victim is unconscious, administer oxygen. If not breathing, resuscitate immediately.

Skin Contact: Wash thoroughly with soap and water. If rash develops, call a physician.

Eye Contact: Flush with water for at least 15 minutes. Seek medical help if required.

VI – Reactivity Data

Fumes and gases from welding and high temperature cutting cannot be classified simply. The composition and quantity of both depend on the metal being welded, the process, procedures, and electrodes 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 welds and the volume of the work area, the quality and amount of ventilation, the position of the welder'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.)

Most fume ingredients are present in complex combinations, rather than as separate compounds. Excessive overexposure may produce the effects outlined in Section 6.

Section VII – Spill or Leak Procedures

Product is a non-hazardous solid. No special precautions are required for spills of bulk material. Scrap metal can be reclaimed for reuse. Follow Federal, State and Local regulations regarding disposal.

Section VIII – Special Protection Information

Ventilation: Use enough ventilation, local exhaust at the arc (or flame), or both, to keep the fumes and gases below the PEL's, TLV's and STEL's in the workers breathing zone and general area. Train the employee to keep his head out of the fumes. See ANSI/ASC Z49.1 Section 5.

Respirator Protection: Use respirable fume respirator or air-supplied respirator when welding in confined area, or where local exhaust or ventilation does not keep exposure below TLV/PEL. Respirator selection and use should be based on contaminant type, form and concentration. Follow OSHA 1910.134, OSHA 1910.1026, ANSI Z88.2 and good industrial Hygiene practice.

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED: Overexposure to manganese can irreversibly affect the central nervous system resulting in impaired speech and movement. Fumes from the normal use of this product contain manganese compounds. The TLV (Threshold Limit Value) for manganese exposure, 0.2

mg/m³, may be exceeded. Use enough ventilation, local exhaust and respirators to keep the workers' breathing zone and general area below the TLV for exposure to manganese.

Eye Protection: Arc Rays can injure your eyes. Wear helmet or face shield with filter lens of appropriate shade number. See ANSI/ASC Z49.1 Section 4.2. Provide protective 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 him/herself from work and ground. Welders should not wear short sleeve shirts or short pants.

Section VIII – Special Precautions and Information

OZONE DEPLETING SUBSTANCES- Products neither contain nor are manufactured with an ozone depleting substance subject to the labeling requirements of the Clean Air Act Amendments of 1990 and 40 CFR Part 82.

IMPORTANT- Maintain exposures below the TLV. Use industrial hygiene air monitoring to ensure that your use of this material does not create exposures which exceed TLV. Always use exhaust ventilation. 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) US Government Printing Office, Washington, DC 20210.

Wash hands thoroughly after use, especially before eating, drinking or smoking.

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