MSDS Name	Cobalt Based Alloys
Revised	June 2006

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: Stellite 31	Specifications: AMS 5789

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 CFR1910.1200); 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
Nickel (Ni) 1	10.5	7440-02-0	1.0	10.5
Cobalt (Co) 1	Balance	7440-48-4	0.1	Balance
Chromium (Cr) 1	25.0	7440-47-3	.005 (as Cr VI)	25.0
Tungsten (W)	7.5	7440-33-7	5.0	7.5
Silicon (Si)	0.7	7440-21-3	-	0.7
Manganese (Mg) 1	0.7	7439-96-5	0.2 (Fume)	0.7
Carbon (C)	0.5	1333-86-4	3.5	0.5

1 Subject to reporting requirements of Section 313 of the Emergency Planning & Community Right-to-Know Act of 1986 (SARA) and 40 CFR Part 372. Chromium and its compounds, cobalt and its compounds, nickel and its compounds and vanadium and its compounds are classified as carcinogens by either NTP and /or IARC

Section III – Physical

Solid Wire or Metal Cored Wire, Odorless, Insoluble, Silver in appearance

Section IV – Fire and Explosion Hazard

These items are not reactive, flammable, or explosive and essentially not hazardous at ambient temperatures. Welding arcs and sparks can ignite combustibles and flammable products. If involved in a fire, these products may generate irritating aluminum fumes and a variety of metal oxides. Emergency responders must wear personal protection equipment suitable for the situation. Use the extinguishing media recommended for the burning materials and fire situation. See ANSI Z49.1 "*Safety in Welding an Cutting*" and "*Safe Practices*" Code: SP, published by the American Welding Society, P.O. Box 351040, Miami, FL, 33135, and NFPA 51B "*Cutting and Welding Processes*," published by the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269 for additional fire prevention and protection information.

Section V – Health Hazard Data

Electric arc welding of oxyfuel welding may create one or more of the following health hazards:
ARC RAYS can injure eyes and burn skin
HEAT RAYS (infrared radiation) from flame or hot metal can injure eyes.
ELECTRIC SHOCK can **KILL**.
NOISE can damage hearing
CARCINOGENICITY Chromium, nickel, cobalt, and their compounds are on the IARC and NTP lists as posing a carcinogenic risk to humans.
EMERGENCY AND FIRST AID PROCEDURES – Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
SHIELDING GASES such as argon, helium and carbon dioxide are asphyxiates and adequate ventilation must be provided.
FUMES AND GASES can be dangerous to your health. COMMON ENTRY IS BY INHALATION.
SHORT TERM (ACUTE)- overexposure to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat, or eyes.
Chromates present in the fume can cause irritation of the respiratory system, damage to lungs and asthma like symptoms.
Nickel compounds in the fume can cause a metallic taste, nausea, tightness in the chest, fever and allergic reactions.
LONG TERM (CHRONIC) – overexposure to welding fumes can lead to siderosis (iron deposits in the lung) and affect pulmonary function.
Chromium VI compounds are required by OSHA to be considered carcinogenic. Long term exposure to Chromium and Chromium II Oxide dust can cause scaling, redness, itchiness, and a burning sensation on the skin. Ling term overexposure to nickel compounds may cause lung fibrosis or pneumoconiosis. Soreness and itchiness of the nose and change in skin color and/or appearance may also result. Nickel and its compounds are required to be considered as carcinogenic by OSHA.
THRESHOLD LIMIT VALUE – The ACGIH 1996-97 recommended limit for welding fumes not otherwise classified (NOC) is 5mg/m3. TLV-TWA's should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations. See Section 5 for specific fume constituents which may modify this TLV-TWA.

VI – Reactivity Data

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welding, the process, procedure and welding consumables used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coating on the metal being welded (i.e. paint, painting, galvanizing), the number of welder, the volume of the work area, the quality and the amount of ventilation, the position of the welders head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from the cleaning and degreasing activities).

When an electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Fume and gas composition, and not the ingredients in the electrode, are important. The concentration of a given fume or gas component may decrease or increase by many times the original concentration. Also, new compounds not in the electrodes may form. Decomposition products of normal operation include those origination from the volatilization, reaction or oxidation of the material shown in Section II, plus those from the base metal coating, etc., as noted above.

Reasonable expected fume constituents of this product would include: Complex oxides of iron, manganese, silicon, chromium, nickel, columbium, molybdenum, copper, carbon dioxide, carbon monoxide, ozone and nitrogen oxides. Some products will also contain antimony, barium, molybdenum, aluminum, columbium, magnesium, strontium, tungsten, and or zirconium. Fume limit for chromium, nickel and or manganese may be reached before limit of 5 mg/m^3 of general welding fumes is reached.

See ANSI/AWS F1.1 "Method for Sampling Airborne Particles Generated by Welding and Allied Process" and "Characterization of Arc Welding Fume" available from the American Welding Society, 550 N.W. LeJeune Road, Miami, Fl 33126

Most welding, even with primitive ventilation, does not produce exposures within the welding helmet above 5mg/m^3. That which does should be controlled.

Section VII – Spill or Leak Procedures

This product is not hazardous per 49 CFR 172.101 by the U.S. Department of Transportation.

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/m^3, 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.

Waste Disposal Method: Prevent waste for contamination surrounding environment. Discard any product of residue in a disposable container or liner in an environmentally approved manner under full compliance with federal, state and local regulations.

Emergency First Aid: Remove from dust of fume exposure immediately and seek medical attention. If breathing has stopped perform artificial respiration and summon emergency medical aid.

For other precaution or additional safety information on welding and cutting, see American Standard Z49.1-1980, *Safety in Welding and Cutting*, and the *Welding Handbook*, Volume 1, Chapter 9, Safe Practices in Welding and Cutting. Both available from the American Welding Society, Inc. 550 N.W. Le Jeune Road, P.O. Box 351040, Miami, FL 33135

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