MATERIAL SAFETY DATA SHEET
For Welding Consumables and Related Products
Essentially Similar to U.S. Department of Labor Form OSHA 20
（to comply with OSHA Hazard Communication Standard 29 CFR 1910.1200）

Classification: ER80SB-2. ER80SD-2. ER90SB-3. ER70S-2. ER70S-3. ER70S-6(SG2/SG3). R45. R60

SECTION II
HAZARDOUS INGREDIENTS/Identity Information

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(29CFR1910.1200); however. the use of this term does not necessarily imply the existence of any hazard.

Ingredients of the product	GAS No.	Approx.% percent	OSHA Pel Mg/M3	ACGIH TLV Mg/3	Carcinogenicity
Iron	7439-89-6	90-99	5	10(asFe2O3)	No
*Manganese	7439-96-5	0,5-2,0	5	1	No
Silicon	7440-21-3	0,02-1,0	5(as SiO2)	3(as SiO2)	No
*Chromium	7440-47-3	0-6,0	0,05(as Chromium VI)	0,05(as Chromium VI)	Yes
Molybdenum	7439-98-7	0-1,5	15	10	No
*Vanadium	7440-62-2	0-0,25	0,01(as V2O5)	0.05(as V2O5)	No

* The ingredients marked with an asterisk are covered under the reporting requirements of Section313 of The Emergency Planning and Community Right to know Act of 1986 and of40 CFR 372

SECTION III
PHYSICAL DATA

Welding Consumables applicable to this sheet arc solid and nonvolatile as shipped

SECTION IV
FIRE AND EXPLOSION HAZARD DATA

Welding Consumables applicable to this sheet as shipped are nonreactive. nonflammable. nonexplosive and essentially nonhazardous until welded

Welding arcs and sparks ignite combustibles products. See American National Standard 249.1 referenced in Section 7.

SECTION V
REACTIVITY DATA

HAZARDOUS DECOMPOSITION PRODUCTS

Welding fumes and gases cannot be classified simply. The composition and quantity of bot hare dependent upon the metal being welded, process, producures and electrodes used. Most fume ingredients are present as complex oxides and

Compounds and not as pure metals.

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(such as paint, plating or galvanizing) the number of welders and the volume of the work area. the quantity and 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 cleaning and degreasing activities) When the electrode is consumed. the fume and gas decomposition products generated are different in percent and form From the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization. reaction or oxidation of the

materials shown in Section 2 plus those from the base metal and coating etc. as noted above

Reasonably expected constituents of the fume would include: Primarily - complex iron oxides and fluorides. Secondarily - complex oxides of calcium,manganese aluminium, chromium. nickel. silicon, molybdenum. magnesium, and titanium.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if wom or in the workers breathing zone (See ANSI/AWSF I.) available from the -American Welding Society". PO. Box 351040. Miami. FL 33 135.

Also from AWS is F l .3 –Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide", which gives additional advice on sampling

SECTION VI
HEALTH HAZARD DATA

EFFECTSOFOVEREXPOSURE:

Electric arc welding may create one or ,more of the following health hazards:

ARC RAYS can injure eyes and bum skin ELECTRIC SHOCK can kill Section 7

FUMESAND GASES can be dangerous to your health. PRIMARY ROUTES OF ENTRY are the respiratory system. eyes and/or skin.

SHORT TERM (ACUTE) OVEREXPOSURE EFFECTS:

WELDING FUMES- May result in discomfort such as dizziness, nausea or dryness or irritation of nose, throat or eyes.

IRON. IRON OXIDE - None are known. Treat as nuisance dust or fume.

MANGANESE: Metal fume fever characterized by chills. fever. upset stomach. vomiting irritation of the throat and aching of body Recovery is generally complete within48 hours of the overexposure

ALUMJNIUM OXIDE: Irritation of the respiratory system.
CALCIUM OXIDE: Dust or fumes may cause irritation of the respiratory system skin and eyes.
MJCA: Dust may cause irritation of the respiratory system skin and eyes.
SILICA: (AMORPHOUS): Dust or Fumes may cause irritation of the respiratory system skin and eyes.
TITANJUM DIOXIDE: irritation of respiratory system.
FLUORIDES: Fluoride compounds evolved may cause skin and eye burns pulmonary edema and bronchitis.
CHROMIUM - Inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory tract lung damage and asthma - like symptoms. Swallowing chromium (VI) salts can cause severe injure or death. Dust on skin can from ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions may occur some people.
NICKEL. NICKELCOMPOUNDS: Metallic taste nausea, tightness in chest, metal fume fever, allergic reaction
MOLYBDENUM - Irritation of the eyes nose and throat
MAGNESIUM. MAGNESIUM OXIDE: Overexposure to the oxide may cause metal fume fever characterized by metallic taste. tightness of chest and fever. Symptoms may last 24 t0 48 hours following overexposure.
LONG TERM (CHRONIC) OVEREXPOSURE EFFECTS :
WELDING FUMES - Excess levels may cause bronchial asthma. lung fibrosis pneumoconiosis or “siderosis”
JRON. IRON OXIDE FUMES - Can cause siderosis (deposits of iron in lungs) which some researches believe may effect pulmonary function Lungs will clear in time when exposure to iron and its compounds causes. Iron and magnetite (Fc304) arc not regarded as fibrogenic materials.
MANGANESE: Long Term Ovcrexposure to manganese compounds may effect the central nervous system. Symptoms may be similar to Parkinson's disease can include slowness. changes in handwriting gait impairment. muscle ,spasms and cramps and less commonly tremor and behavioral changes Employees who are overexposed to manganese compounds should be seen by a physician for early detection of neurologic problems.
ALUMINUM OXIDE: Pulmonary fibrosis and emphysema.
CALCIUM OXIDE: Prolonged overexposure may cause ulceration of the skin perforation of the nasal septum. dematitis and pneumonia.
MJCA: Prolonged overexposure may cause searring of the lungs and pneumoconiosis characterized by cough. shortness of breath weakness and weight loss.
SILICA(AMORPHOUS): Researches indicates that silica is present in welding Fume in the amorphous form. Long term overexposure may cause pneumocon osis. Noncrystalline Forms of silica (amorphous silica) are considered to have little fibrotic potential.
TITANIUM OXIDE:Pulmonary irritation and slight fibrosis.
FLUORIDES: Serious bone erosion (Osteoporosis and mottling of teeth.
CHROMIUM: Ulceration and perforation of nasal septum Respiratory irritation may occur with symptoms resembling asthma. Studies have shown that cromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. Chromium (VI) compounds are more readily absorbed through Lhe skin than chromium (III) compounds Good practice requires the reduction oFemployee exposure to chromium (III) and (VI) compounds.
NICKEL AND NICKEL COMPOUNDS: Lung fibrosis or pneumoconiosis may result in loss of appetite. weight toss. loss of muscle coordination. difficulty in breathing and anemia
MAGNESIUM. MAGNESIUM OXIDE: No adverse long term health efTects have been reported in the literature
MEDICALCONDITIONS AGGRAVATED EXPOSURE: Persons with pre-exiting impaired lung functions (asthma-like conditions)
EMERGENCYAND FIRSTAID PROCEDURES: Call for medical aid. employ first aid tecniques recommended by the American Red Cross. Eyes & Skin:If irritation or flash burns develop after exposure. consult a physician.
CARCINOGENICITY: Chromium VI and nickel compounds must be considered as carcinogens under OSHA (29 CFR 1910.1200) Chromium VI compounds are classified as JARC Group I and NTP Group I and NTP Group 2 carcinogens Welding fumes must be considered as possible carcinogens under OSHA(29 CFR 1910.1200)
CALIFORNIAPROPOSITION 65: For Group B and C products: WARNING: This product contains or produces a chemical known to the State of California to cause cancer and birth defects and in some cases cancer.(California Health&Safety Code Section 25249.5 et seq.)

SECTION VII
SPILL OR LEAK PROCEDURES

WASTEDISPOSAL METHOD: Prevent waste from contaminating surronding environment Discard any product residue. diposable container or in an environ entally accetable manner. in full compliance with Federal. State and Local regulation

SECTION VIII
SPECIAL PROTECTION INFORMATION (See Note)

“Read and understand the manufacturer’s instructions and the precautionary label on the product.Ventilation-Use enough Ventilation,local exhaust at the arc,or both. to keep the fumes and gases From the worker's breathing zone and general area. Train the welder to keep his head out of the Fumes. Respiratory Protection-Use respirable fume respiratory or air-supplied respirator when welding in a confined space or where local exhaust or ventilation does not keep exposure below a recommended exposure lime Eye Protection- Wear helmet or use face shield with filter lens. Provide protective screens and flash gogles. If necessary. to shield others. As a rule of thumb start with a shade that is too dark to see the weld zone Then go. the next lighter shade. which gives sufficient view of the weld zone. Protective Clothing-Wear ,head and body protection that helps to prevent injury from radiation. sparks and clectric shock. See ANSI 249.1. 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 welder not to touch live electrical parts and to insulate himself from work and ground”

SECTION IX
SPECIAL PRECAUTIONS (See Note)

OTHER PRECAUTIONS: Use exhaust system to clear welding fumes Make sure that inhaled air does not contain fume constituents above permissible exposure levels.
NOTE: Other Precautions for additional safety information on welding and cutting, see American Standard Z49. 1- 1983. Safety in Welding and Cutting, and the Welding Handbook.Vol.1,Chapter9,Safety Practices in welding and Cutting. both available from American Welding Society. Inc 550. NW le Jeune Road. P:O Box 351040.
Miami. Fl. 33135.Tcl. {305)443-9353
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