

MATERIAL SAFETY DATA SHEET

Filler Metals and Welding Rods

"ESSENTIALLY SIMILAR" to U.S. Department of Labor Form OSHA 20
(to comply with OSHA's Hazard Communication Standard 29 CFR 1910.1200)

SECTION I

December 6-1988

Manufacturer's Name: Hi-Alloy Weld Specialties Emergency Phone 713-645-3270
Address: 4575 South Wavside Dr., Houston, Texas 77087
Trade Name: Hi-Alloy Product Type: #460 Cast Iron Electrode

The ingredients marked in Section II with an asterisk (*) can be expected to be released by this product during the gouging operation. Others may be released as dust or fumes.

SECTION II

HAZARDOUS INGREDIENTS/Identity Information

IMPORTANT: This Section covers materials from which this product is manufactured.

Ingredients of The Product	CAS No.	OSHA PEL Mg/M3	ACGIH TLV Mg/M3	Carcinogenicity
Nickel	7440-02-0	1	1	Yes
Chromium	7440-47-3	.05 (Chromium VI)	.05 (Chromium VI)	Yes
Iron	7439-89-6	5	10 (as Fe ₂ O ₃)	No
Manganese	7439-96-5	5	1	No
Tungsten	7439-98-7	15	10	No
Aluminum	7440-03-1	5	5	No
Copper	7440-50-8	.1	.2	No
Silicon	7440-21-3	5 (as SiO ₂)	3 (as SiO ₂)	No
Titanium	7440-32-6	15 (as TiO ₂)	10 (as TiO ₂)	No
White	7782-42-5	Not Registered	5	No
Sodium Carbonate	1317-65-3	5 (as CaO)	10	No
Calcium Fluoride	14542-32-5	2.5 (as F)	2.5 (as F)	No
Synthetic	15096-52-3	2.5 (as F)	2.5 (as F)	No
Potassium Titanate	12030-97-6	Not Registered	10	No
Titanium Dioxide	13463-67-7	15	10	No
Potassium Silicate	1312-76-1	Not Registered	5	No
Sodium Silicate	1344-09-8	Not Registered	5	No

SECTION III

PHYSICAL DATA

NOT APPLICABLE

SECTION IV

FIRE AND EXPLOSION HAZARD DATA

Welding arc and sparks can ignite combustibles and flammables. Refer to American National Standard Z49.1 for fire prevention during the use of welding and allied procedures.

SECTION V

HEALTH HAZARD DATA

Electric arc-welding may create one or more of the following health hazards: Fumes and gases can be dangerous to your health. Arc Rays can injure eyes and burn skin. Electric Shock can kill.

EFFECTS OF OVEREXPOSURE: "Short-term overexposure to welding fumes may result in discomfort such as: dizziness, headache, or dryness or irritation of nose, throat, or eyes, tightness in chest, fever and allergic reactions, (see Sections 4 and 5). "Long-term (chronic) overexposure to welding fumes may lead to siderosis (iron deposit in lungs) and is believed by some investigators to affect pulmonary function. Nickel, chromium and their compounds are considered carcinogenic by OSHA.

EMERGENCY & FIRST AID PROCEDURES: Remove to fresh air, obtain medical attention. Employ first aid techniques recommended by the American Red Cross.

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SECTION VI REACTIVITY DATA

STABILITY: UNSTABLE: NO

CONDITIONS TO AVOID: NONE; UNLESS OTHERWISE SPECIFIED

STABLE: YES

CONDITIONS TO AVOID: NONE; UNLESS OTHERWISE SPECIFIED

COMPATIBILITY (MATERIALS TO AVOID): NONE

HAZARDOUS DECOMPOSITION PRODUCTS: The composition and quality of welding fumes and gases are dependent upon the metal being welded, the process, procedure, 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 welders 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). 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. Fume and gas decomposition products, 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 in the electrode. Also, new compounds not in the electrode may form. 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.

Most notably expected fume constituents of these products could include primarily oxides of nickel; secondarily complex oxides of iron, chromium, manganese, silicon, titanium, copper, molybdenum, aluminum and columbium. The OSHA permissible exposure limits and ACGIH threshold limit value is $1.0\text{mg}/\text{M}^3$ for nickel and $.05\text{mg}/\text{M}^3$ for hexavalent chromium. Welding fumes may also contain fluorides and OSHA (PEL) and ACGIH (TLV) limits are $2.5\text{mg}/\text{M}^3$. It is to be noted that all the above will result in significant reduction from the $5\text{mg}/\text{M}^3$ general fume level.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

The 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 AWS F1.1 and AWS F1.2-1985, available from the American Welding Society.

SEE AWS PUBLICATION: "FUMES AND GASES IN THE WELDING ENVIRONMENT"

HAZARDOUS POLYMERIZATION: NOT APPLICABLE.

SECTION VII SPILL OR LEAK PROCEDURES NOT APPLICABLE

WASTE DISPOSAL METHOD: Prevent waste from contaminating surrounding environment. Discard any product residue, disposable container or liner in an environmentally acceptable manner, in full compliance with Federal, State and Local regulations.

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 the 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 the recommended exposure limit. *Eye Protection* - Wear helmet or use face shield with filter lens. Provide protective screens and flash goggles, 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 to the next lighter shade which gives sufficient view of the weld zone. *Protective Clothing* - Wear hand, head, and body protection which help to prevent injury from radiation, sparks, 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 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 labeled elements not contribute to constituents above permissible exposure levels.

For more information on welding and cutting, see American Standard Z49.1-1983, Safety in Welding and Cutting, and the Welding Handbook, Vol. 1, Chapter 9, Safe Practices in Welding and Cutting, both available from American Welding Society, Inc., 550 N.W. Le Jeune Road, P.O. Box 351040, Miami, FL 33104-0040. 447.0757

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