



**HARDFACING WIRES**  
**MATERIAL SAFETY DATA SHEET**

Filler Metals and Welding Rods

**SECTION 1**

**Manufacturer's Name:** Amtec Welding Products    **2800 Capital Street**    **Wylie, TX 75098**  
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**Product Number and Type:** Amtec Hardfacing Cored Wire: W1067-MC

**SECTION 2 - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION**

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

| Ingredients of The Product  | CAS No.   | ACGIH TLV mg/m <sup>3</sup> | OSHA PEL mg/m <sup>3</sup>               | Other Ingredients and/or comments  |
|-----------------------------|-----------|-----------------------------|--|--|
| Chromium *                  | 7440-47-3 | .5                          | 1.0                                      |  |
| Iron                        | 7439-89-6 | N.A.                        | N.A.                                     | Oxides and/or Fluorides of Aluminum, Barium, Calcium, Iron, Magnesium, Potassium, Silicon, Titanium, Zirconium   |
| Manganese *                 | 7439-96-5 | 0.2 for fume                | 5.0 as ceiling (dust)<br>1.3 Stel (fume) | <b>WARNING: This product contains or produces a chemical known to the State of California to cause cancer and birth defects (or reproductive harm).</b><br>(California Health & Safety Code 25249.5 et seq.) |
| Silicon (SiO <sub>2</sub> ) | 7440-21-3 | 3.0                         | 5.0                                      |  |
| Carbon                      | 7782-42-5 | 3.5                         | 3.5                                      |  |
| Vanadium *                  | 7440-62-2 | .05 as fume                 | .01 as fume                              |  |
| Molybdenum                  | 7439-98-7 | 10.0                        | 15.0                                     |  |
| Nickel *                    | 7440-02-0 | 1.0                         | 1.0                                      |  |
| Tungsten                    | 7440-33-7 | 1.0                         | N.A.                                     |  |
| Columbium                   | 7440-03-1 | 5.0                         | 5.0                                      |  |
| Boron                       | 7440-42-8 | N.A.                        | N.A.                                     |  |
| Cobalt *                    | 7440-48-4 | .05                         | 0.1                                      |  |

Chemicals listed in Section 313 of SARA Title III are identified with an asterisk(\*)

**SECTION 3 - PHYSICAL DATA**

These products as shipped are nonhazardous, nonflammable, nonexplosive and nonreactive.

**SECTION 4 - FIRE AND EXPLOSION HAZARD DATA**

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

**SECTION 5 - REACTIVITY DATA -- HAZARDOUS REACTION PRODUCTS**

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 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.)

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

**SECTION 6 - EXPOSURE LIMITS -- 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. Amtec Welding Products, Inc. recommends monitoring of these chemicals.

**Table 6a**

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

For virtually all welding electrodes, the ACGIH Welding Fumes - Total Particulate TLV of 5 mg/m<sup>3</sup> 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 6b. 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/m<sup>3</sup>

| Metal or Chemical   | CAS No.    | Metal or Chemical         | CAS No.    | Metal or Chemical | CAS No.       |
|---------------------|------------|---------------------------|------------|-------------------|---------------|
| Aluminum            | 7429-90-5  | Magnesium                 | 7439-95-4  | Strontium oxide   | 1314-11-0     |
| Aluminum oxide      | 1344-28-1  | Magnesium oxide           | 1309-48-4  | Titanium          | 7440-32-6     |
| Boron               | 7440-42-8  | Molybdenum                | 7439-98-7  | Titanium oxide    | 13463-67-7    |
| Boron oxide         | 1303-86-2  | Molybdenum oxide          | 18868-43-4 | Tungsten          | 7440-33-7     |
| Columbium (Niobium) | 7440-03-1  | Potassium                 | 7440-09-7  | Tungsten oxide    | 39318-18-8    |
| Cr or Nb oxide      | 1313-96-8  | Potassium oxide           | 12136-47-7 | Vanadium          | 7440-62-2     |
| Calcium             | 7440-70-2  | Silicon                   | 7440-21-3  | Vanadium oxide    | 1314-62-1     |
| Calcium oxide       | 1305-78-8  | Silicon oxide (amorphous) | 7631-86-9  | Welding fumes     | Not specified |
| Calcium fluoride    | 7789-75-5  | Sodium                    | 7440-23-5  | Zirconium         | 7440-67-7     |
| Lithium             | 7439-92-2  | Sodium oxide              | 1313-59-3  | Zirconium oxide   | 1314-23-4     |
| Lithium oxide       | 12057-24-8 | Strontium                 | 7440-24-6  |                   |               |

#### 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 Sections 2 and 6.

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.

#### **SECTION 7 - SPILL 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 8 - SPECIAL PROTECTION INFORMATION**

##### **READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTIONS AND THE PRECAUTIONARY LABEL ON THE PRODUCT**

**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.

**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 NIOSH approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV.

**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 9 - 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.