MATERIAL SAFETY DATA SHEET

For U.S. Manufactured or Distributed Welding Consumables and Related Products.

SECTION 1 - IDENTIFICATION

Manufacturer/Supplier Name: ITW HOBART BROTHERS
Address: 400 TRADE SQUARE EAST, TROY, OH 45373
Trade Name: AWS WELDING ELECTRODE CLASSIFICATIONS ER70S-3, ER70S-6, AND ER80S-D2
Product Type For: GAS METAL ARC WELDING (GMAW) SOLID WIRE

SECTION 2 - HAZARDOUS INGREDIENTS

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with normal use of this product are covered by Section 5. The term "hazardous" in this section should be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200).

HAZARDOUS INGREDIENTS   CAS NO.   WEIGHT %   OSHA PEL   ACGIH TLV

<table>
<thead>
<tr>
<th>HAZARDOUS INGREDIENTS</th>
<th>CAS NO.</th>
<th>WEIGHT %</th>
<th>EXPOSURE LIMIT (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRON+</td>
<td>7439-89-6</td>
<td>95</td>
<td>5 (Oxide Fume)</td>
</tr>
<tr>
<td>#MANGANESE</td>
<td>7439-96-5</td>
<td>1-5</td>
<td>10 (Oxide Fume)</td>
</tr>
<tr>
<td>SILICON</td>
<td>7440-21-3</td>
<td>0.5-1.5</td>
<td>5 (Oxide Fume)</td>
</tr>
<tr>
<td>#COPPER (1)</td>
<td>69012-64-2</td>
<td>0.1-0.5</td>
<td>0.8</td>
</tr>
<tr>
<td>#MOLYBDENUM (2)</td>
<td>7439-98-7</td>
<td>0.1-1</td>
<td>5 R*</td>
</tr>
</tbody>
</table>

- As a nuisance particulate covered under "Particulates Not Otherwise Regulated" by OSHA or "Particulates Not Otherwise Classified" by ACGIH.
-报告材料，Section 313 of SARA。{A3} - "Confirmed Animal Carcinogen with Unknown Relevance to Humans".
- Not Classifiable as a Human Carcinogen per ACGIH.
- 2002 ACGIH listed under Notice of Intended Changes. A2 - "Suspected Human Carcinogen".
- Copper, if contained in the product, is clearly visible and only present as a surface coating.

Important

The exposure limit for welding fume has been established at 5 mg/m³ with OSHA's PEL and ACGIH's TLV. The individual complex compounds within the fume may have lower exposure limits than the general welding fume PEL/TLV. An Industrial Hygienist, the OSHA Permissible Exposure Limits for Air Contaminants (29 CFR 1910.1000), and the ACGIH Threshold Limit Values should be considered to determine the specific fume constituents present and their respective exposure limits.

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Welding consumables applicable to this sheet are solid and nonvolatile as shipped.

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Welding consumables applicable to this sheet are nonreactive, nonflammable, nonexplosive and essentially nonhazardous until welded. Welding arcs and sparks can ignite combustibles and flammable products. See American National Standard Z49.1 referenced in Section 7.

SECTION 5 - 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 welded, the process, procedures and electrodes used. Most fume ingredients are present as complex oxides and compounds and not as pure metals.

Welding fumes are nonreactive, nonflammable, and nontoxic except when inhaled. They are composed of a variety of metal oxides and compounds that result from the chemical reaction of the metal with oxygen or other gases in the atmosphere. The composition of the welding fume varies depending on the type of welding process, the type of metal being welded, and the protective atmosphere used.

Hazards

1. Respiratory Effects: Fume may be inhaled and cause respiratory irritation, coughing, wheezing, and shortness of breath.
2. Skin Irritation: Fume may cause skin irritation and dermatitis.
3. Eye Irritation: Fume may cause irritation to the eyes.
4. Flammability: Fume may be flammable in concentrated forms.

Preventive Measures

1. Use respiratory protection equipment such as a welding helmet or respirator with appropriate filters.
2. Keep work area well ventilated.
3. Avoid direct contact with fumes and gases.
4. Use caution when handling welding consumables.

415841 Page 1 of 2
SECTION 6 - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:
Electric arc welding may create one or more of the following health hazards:
ARC RAYS can injure eyes and burn skin.
ELECTRIC SHOCK can kill. See Section 7.
FUMES AND 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 within 48 hours of the overexposure.
SILICA (AMORPHOUS) - Dust and fumes may cause irritation of the respiratory system, skin and eyes.
COPPER - Metal fume fever characterized by metallic taste, tightness of chest and fever. Symptoms may last 24 to 48 hours following overexposure.
MOLYBDENUM - Irritation of the eyes, nose and throat.

LONG-TERM (CHRONIC) OVEREXPOSURE EFFECTS:
WELDING FUMES - Excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis".
IRON, IRON OXIDE FUMES - Can cause siderosis (deposits of iron in lungs) which some researchers believe may affect pulmonary function. Lungs will clear in time when exposure to iron and its compounds ceases. Iron and magnetite (Fe3O4) are not regarded as fibrogenic materials.
MANGANESE - Long-term overexposure to manganese compounds may affect the central nervous system. Symptoms may be similar to Parkinson's Disease and 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.
SILICA (AMORPHOUS) - Research indicates that silica is present in welding fume in the amorphous form. Long term overexposure may cause pneumoconiosis. Noncrystalline forms of silica (amorphous silica) are considered to have little fibrotic potential.
MOLYBDENUM - Prolonged overexposure may result in loss of appetite, weight loss, loss of muscle coordination, difficulty in breathing and anemia.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
Persons with pre-existing impaired lung functions (asthma-like conditions).

EMERGENCY AND FIRST AID PROCEDURES:
Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
Eyes and Skin: If irritation or flash burns develop after exposure, consult a physician.

CARCINOGENICITY:
Welding fumes must be considered as possible carcinogens under OSHA (29 CFR 1910.1200).

CALIFORNIA PROPOSITION 65:
WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING & USE/APPLICABLE CONTROL MEASURES

Read and understand the manufacturer's instructions and the precautionary label on the product. 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 (29 CFR 1910), U.S. Government Printing Office, Washington, DC 20402 for more detail on any of the following.

VENTILATION: Use enough ventilation, local exhaust at the arc or both, to keep the fumes and gases below PEL/TLVs in 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 PEL/TLVs.

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 nonsynthetic clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS: Not applicable.

WASTE DISPOSAL: 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.

SPECIAL PRECAUTIONS (IMPORTANT): Maintain exposure below the PEL/TLVs. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLVs. Always use exhaust ventilation. Refer to the following sources for important additional information: ANSI Z49.1 from the American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA (29 CFR 1910) from the U.S. Department of Labor, Washington, DC 20210.

ITW Hobart Brothers believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, ITW Hobart Brothers cannot make any expressed or implied warranty as to this information.