**SECTION I - IDENTIFICATION**

**Manufacturer/Supplier:** The Lincoln Electric Company  
22801 St. Clair Avenue  
Cleveland, OH 44117-1199  
(216) 481-8100

**Product Type:** Covered Electrode  
**Classification:** AWS E7018

**SECTION II - HAZARDOUS MATERIALS**

*IMPORTANT!*

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section VII; see it for industrial hygiene information. CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.

1. The term 'hazardous' in 'Hazardous Materials' should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard.

**Ingredients:**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>TLV mg/m³</th>
<th>PEL mg/m³</th>
<th>Supplemental Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>7439-89-6</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>Not listed. Nuisance value maximum is 10 mg/m³. PEL value for iron oxide is 10 mg/m³. TLV value for iron oxide is 5 mg/m³. ** As respirable dust.</td>
</tr>
<tr>
<td>Limestone and/or calcium carbonate</td>
<td>1317-65-3</td>
<td>10</td>
<td>10</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Fluorides (as F)</td>
<td>7789-75-5</td>
<td>5</td>
<td>2.5</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Silicates and other binders</td>
<td>1344-09-8</td>
<td>&lt; 5</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Titanium dioxide (as Ti)***</td>
<td>13453-67-7</td>
<td>&lt; 5</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Manganese and/or manganese alloys and compounds (as Mn)***</td>
<td>7439-96-5</td>
<td>&lt; 5</td>
<td>1.0(c)</td>
<td>1.0(c)</td>
<td></td>
</tr>
<tr>
<td>Silicon and/or silicon alloys and compounds (as Si)</td>
<td>7440-21-3</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Aluminum oxide and/or Bauxite***</td>
<td>1344-28-1</td>
<td>&lt; 0.5</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Zinc and/or zinc oxides***</td>
<td>1314-13-2</td>
<td>&lt; 0.5</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Mineral silicates</td>
<td>1332-58-7</td>
<td>&lt; 0.5</td>
<td>5**</td>
<td>5**</td>
<td></td>
</tr>
<tr>
<td>Vanadium alloys (as V)</td>
<td>7440-62-2</td>
<td>&lt; 0.5</td>
<td>0.05(9)</td>
<td>0.05(9)</td>
<td></td>
</tr>
<tr>
<td>Carbon steel core wire</td>
<td>7439-89-6</td>
<td>60</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

2. As V₂O₅ fume or dust.

3. Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter.

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

Non Flammable; Welding arc and sparks can ignite combustibles and flammable products. See 249.1 referenced in Section VI.

**Supersedes** 1/31/91

(Continued on Side Two)
SECTION IV. HEALTH HAZARD DATA

Threshold Limit Values: The ACGIH recommended general limit for Welding Fume NCO - (Not Otherwise Classified) is 5 mg/m³.  
AOSI-BSA-887-88 proposes that the TLV-TWA should be used as guides in the control of health hazards and so be not be used as fire lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV. Threshold Limit Values may be found on the American Conference of Governmental Industrial Hygienists website. 

Effects of overexposure: Electric arc welding may cause one or more of the following health hazards: 
- Burns and gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion.  
- Short-term (acute) overexposure to welding fumes may result in discomfort such as muscle fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death. 
- Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. 
- Exposure to some long fumes have been reported. Repeated exposure to fluorides may cause excessive calcification of the bone and ossification of ligaments of the rib, pelvis and spinal column. May cause skin rash. 

Arc rays can injure eyes and burn skin. 

Electric Shock can kill. 
- Welding must be performed in damp locations or with wet clothing, on metal structures or when in contact with wettedAR. 
- Kneeling or laying, if there is a high risk of unavoidable or accidental contact with workpiece. 
- Use the following equipment: Semi-automatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control. 

Emergency and first aid procedures: 
- Consult your local medical facility. 
- For first aid techniques recommended by the American Red Cross. 
- In case of a break in electrical systems or power, follow recommended treatment. In all cases call a physician. 

SECTION V. 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, 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: 
- Special conditions such as existing, kneeling or laying if there is a high risk of unavoidable or accidental contact with workpiece. 
- The position of the welder’s head with respect to the fume plume. 
- 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. 
- The presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities). 

When these conditions are considered, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coatings, etc., as noted above. 

Reasonably expected fume constituents of this product would include: Primarily iron oxide and fluorides; secondarily complex oxides of manganese, asbestos, silicon, sodium, and zinc. 

Maximum permissible exposure (MPE) for this product is 5.0 milligrams per cubic meter. 

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

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder’s breathing zone and from the general area. 

SECTION VI AND VII. CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer’s instructions and the precautionary label on the product. 
- Request Lincoln Safety Publication 2265. 
- See American National Standard Z49.1, Safety in Welding and Cutting. 
- Published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126 and OSHA Publication 2206 (29CFR1910). 
- Washington, D.C. 20402. 
- Also in many of the following: 
- Ventilation: 
- Respiratory protection: Use a respirator. 
- Consult the manufacturer’s instructions on the product. 
- Eye protection: Wear a face shield or welder’s goggle. 
- Gloves: Wear rubber or leather gloves. 
- Protective clothing: 
- Fabric: 
- Flammable: 
- Electrical shock: 
- Protective clothing which help to prevent injury from welding, sparks and electrical shock. See Z49.1. 
- At a minimum this includes welder’s gloves and a protective face shield, and may include arm protectors, aprons, naps, and chemical protective clothing, as well as dark substantial clothing. 
- Insulate from work and ground. 
- Disposal information: Discard any product, residue, disposable container, or liner as ordinary waste in an environmentally sensitive manner unless otherwise noted.