# Nickel Electrodes

This Safety Data Sheet (SDS) is for welding consumables and related products and may be used to comply with OSHA’s Hazard Communication standard, 29 CFR 1910.1200, Superfund Amendments and Reauthorization Act (SARA) of 1986 Public Law 99-499 and Canadian Workplace Hazardous Materials Information System (WHMIS) per Health Canada administrative policy. The OSHA standard must be consulted for specific requirements. This Safety Data Sheet complies with ISO 11014-1 and ANSI Z400.1

## Section 1: Identification

**Manufacturer/Supplier:** American Filler Metals Company  
**Address:** 6015 Murphy Street, Houston, TX 77033  
**Emergency No.:** Chemtrec: (800) 424-9300  
**Emergency No.:**  
**Telephone No.:** (713) 649-8785  
**Website:** [www.amfiller.com](http://www.amfiller.com)

**Classification:**  
- **Trade Name:** AFM-W (ENiMo-3), AFM-187 (ECuNi)  
- **AFM-112 (ENiCrMo-3), AFM-117 (ENiCrCoMo-1), AFM-122 (ENiCrMo-10),**  
- **AFM-141 (ENi-1), AFM-182 (ENiCrFe-3), AFM-190 (ENiCu-7),**  
- **AFM-C276 (ENiCrMo-4), AFM-A (ENiCrFe-2), AFM-X (ENiCrMo-2),**  
- **AFM-G30 (ENiCrMo-11)**

## Section 2: Hazard(s) Identification

**IMPORTANT** - This section covers the hazardous materials from which this product is manufactured. This data has been classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) as required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200). The fumes and gases produced during welding with normal use of this product are addressed in Section 8.

### Hazard Classification:

This product is not classified as hazardous according to applicable GHS hazard classification criteria.

### Label Elements:

- **Hazard Symbol – No symbol required**
- **Signal Word – No signal word required**
- **Hazard Statement – No applicable**
- **Precautionary Statement – Not Applicable**

### Hazardous Ingredient

<table>
<thead>
<tr>
<th>Hazardous Ingredient</th>
<th>CAS</th>
<th>EINCS</th>
<th>Regulatory Hazard Classification/Designation 67/548/EEC Δ</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium Carbonate</td>
<td>1317-65-3</td>
<td>215-279-6</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chromium</td>
<td>7440-47-3</td>
<td>231-157-5</td>
<td>0 - R9; Carc 1a - R45; Mutagen 2 - R46; Repro 3 - R62; T - R26; T - R24/25, R48/23, C - R35, R42/43; N - R50, R53333</td>
<td>111, 31</td>
<td>K51</td>
<td>XI</td>
</tr>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>231-159-6</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Graphite</td>
<td>7782-42-5</td>
<td>231-955-3</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Iron</td>
<td>7439-89-6</td>
<td>231-096-4</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Manganese</td>
<td>7439-96-5</td>
<td>231-105-1</td>
<td>Xn-R20/22</td>
<td>1</td>
<td>K</td>
<td>X</td>
</tr>
<tr>
<td>Nickel</td>
<td>7440-02-0</td>
<td>231-111-4</td>
<td>Carc 3e - R40; T - R43, R48/23</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Silicon</td>
<td>7440-21-3</td>
<td>231-130-8</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sodium Silicate</td>
<td>1344-09-8</td>
<td>215-687-4</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Strontium Carbonate</td>
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<td>232-000-3</td>
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<td>-</td>
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<tr>
<td>Titanium</td>
<td>7440-32-6</td>
<td>231-142-3</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Titanium Dioxide</td>
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<td>236-675-5</td>
<td>None</td>
<td>2B</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Δ – European Inventory of Existing Chemical Substances Number  

### GHS-US Classification

- **Skin Sens. 1 : H317**
- **Cars. 1B : H350**
- **STOT RE 1 : H372**
- **Aquatic Acute 1 : H400**
- **Aquatic Chronic 3 : H412**
Section 3: Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS</th>
<th>EINECS</th>
<th>% Weight</th>
<th>Ingredient</th>
<th>CAS</th>
<th>EINECS</th>
<th>% Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium Carbonate</td>
<td>1317-65-3</td>
<td>215-279-6</td>
<td>5 – 10</td>
<td>Nickle</td>
<td>7440-02-0</td>
<td>231-111-4</td>
<td>43.91 – 92</td>
</tr>
<tr>
<td>Chromium</td>
<td>7440-47-3</td>
<td>231157-5</td>
<td>0 – 31.5</td>
<td>Silicon</td>
<td>7440-21-3</td>
<td>231-130-8</td>
<td>0.2 – 1.25</td>
</tr>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>231-159-6</td>
<td>0.25 – 68.1</td>
<td>Sodium Silicate</td>
<td>1344-09-8</td>
<td>215-687-4</td>
<td>&lt;= 5</td>
</tr>
<tr>
<td>Graphite</td>
<td>7782-42-5</td>
<td>231-955-3</td>
<td>&lt;= 3</td>
<td>Strontium Carbonate</td>
<td>1633-05-2</td>
<td>216-643-7</td>
<td>&lt;= 15</td>
</tr>
<tr>
<td>Iron</td>
<td>7439-89-6</td>
<td>231-096-4</td>
<td>4 – 21</td>
<td>Titanium</td>
<td>7440-32-6</td>
<td>231-142-3</td>
<td>&lt;= 4</td>
</tr>
<tr>
<td>Manganese</td>
<td>7439-96-5</td>
<td>231-105-1</td>
<td>0.3 – 9.5</td>
<td>Titanium Dioxide</td>
<td>13463-67-7</td>
<td>236-675-5</td>
<td>&lt;= 10</td>
</tr>
</tbody>
</table>

(Safety Data Sheet)
Section 4: First Aid Measures

Inhalation: If breathing is difficult provide fresh air and contact physician.

Eye/Skin Injuries: For radiation burns, see physician.

Section 11 of this SDS covers the acute effects of overexposure to the various ingredients within the welding consumable. Section 8 of this SDS lists the exposure limits and covers methods for protecting yourself and your co-workers.

Section 5: 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 can ignite combustibles and flammable products. Unused welding consumables may remain hot for a period of time after completion of a welding process. See American National Standard (ANSI) Z49.1 for further general safety information on the use and handling of welding consumables and associated procedures.

Section 6: Accidental Release Measures

Solid objects can be picked up and placed into a container. Wear proper personal protective equipment while handling. Do not discard as general trash.

Section 7: Handling and Storage

Handling: No specific requirements in the form supplied. Handle with care to avoid cuts. Wear gloves when handling welding consumables. Avoid exposure to dust. Do not ingest. Some individuals can develop an allergic reaction to certain materials.

Storage: Keep separate from acids and strong bases to prevent possible chemical reactions.

Section 8: Exposure Control and Personal Protection

Read and understand the instructions and the labels on the packaging. Welding fumes do not have a specific OSHA PEL or ACGIH TLV. The OSHA PEL for Particulate – Not Otherwise Classified (PNOC) is 5 mg/m3 – Respirable Fraction, 15 mg/m3 – Total Dust. The ACGIH TLV for Particles – Not Otherwise Specified (PNOS) is 3 mg/m3 – Respirable Particles, 10 mg/m3 – Inhalable Particles.

The individual complex compounds within the fume may have a lower OSHA PEL or ACGIH TLV than the OSHA Particulate – Not Otherwise Classified (PNOC) and ACGIH Particles – Not Otherwise Specified (PNOS). An Industrial Hygienist, the OSHA Permissible Exposure Limits for Air Contaminants (29 CFR 1910.1000), and the ACGIH Threshold Limit Values should be consulted to determine the specific fume constituents present and their respective exposure limits. All exposure limits are in milligrams per cubic meter (mg/m3).

Inhalation: If breathing is difficult provide fresh air and contact physician.

Eye/Skin Injuries: For radiation burns, see physician.

Section 11 of this SDS covers the acute effects of overexposure to the various ingredients within the welding consumable. Section 8 of this SDS lists the exposure limits and covers methods for protecting yourself and your co-workers.
Section 8: Exposure Control and Personal Protection (Continued)

- **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 non-synthetic 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

- **Special Precautions (IMPORTANT):** Maintain exposure below the PEL/TLV/OEL. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV/OEL. Always use exhaust ventilation. Refer to the following sources for important additional information: American National Standard (ANSI) 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.

Section 9: Physical and Chemical Properties

Welding consumables applicable to this sheet are nonreactive, nonflammable, nonexplosive and essentially nonhazardous until welded.

- **Physical State:** Coated Electrode
- **Color:** Gray
- **Odor:** N/A
- **Form:** Stick Electrode

Section 10: Stability and Reactivity

**GENERAL:** Welding consumables applicable to this sheet are solid and nonvolatile as shipped. This product is only intended for use per the welding parameters it was designed for. When this product is used for welding, hazardous fumes may be created. Other factors to consider include the base metal, base metal preparation and base metal coatings. All of these factors can contribute to the fume and gases generated during welding. The amount of fume varies with the welding parameters.

**Stability:** This product is stable under normal conditions. **Reactivity:** Contact with acids or strong bases may cause generation of gas.

Section 11: Toxicological Information

**Short-Term (Acute) Overexposure Effects: Welding Fumes** - May result in discomfort such as dizziness, nausea or dryness or irritation of nose, throat or eyes.

**Calcium Oxide** - Dust or fumes may cause irritation of the respiratory system, skin and eyes.

**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 injury or death. Dust on skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions may occur in some people.

**Iron, Iron Oxide** - None are known. Treat as nuisance dust or fume.

**Manganese, Manganese Oxide** - 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.

**Sodium Oxide** - Dust or fumes may cause irritation of the respiratory system, skin and eyes.

**Strontium Compounds** - Strontium salts are generally nontoxic and are normally present in the human body. In large oral doses, they may cause gastrointestinal disorders, vomiting and diarrhea.

**Titanium Dioxide** - Irritation of respiratory system.

**Long-Term (Chronic) Overexposure Effects: Welding Fumes** - Excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "silicosis."

**Calcium Oxide** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia.

**Chromium** - Ulceration and perforation of nasal septum. Respiratory irritation may occur with symptoms resembling asthma. Studies have shown that chromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. Chromium (VI) compounds are more readily absorbed through the skin than chromium (III) compounds. Good practice requires the reduction of employee exposure to chromium (III) and (VI) compounds.

**Columbium** - No adverse long-term health effects have been reported in the literature.

**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, impairement, 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. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include blurred vision, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait.

**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.

**Titanium Dioxide** - Prolonged overexposure may cause ulceration of the skin and perforation of the nasal septum, dermatitis and pneumonia.

**Strontium Compounds** - Strontium at high doses is known to concentrate in bone. Major signs of chronic toxicity, which involve the skeleton, have been labeled as "strontium rickets."

Section 12: Ecological Information

Welding processes can release fumes directly to the environment. Welding wire can degrade if left outside and unprotected. Residues from welding consumables and processes could degrade and accumulate in the soil and groundwater.
# Section 13: Disposal Considerations

Use recycling procedures if available. Discard any product, residue, packaging, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

## Section 14: Transport Information

No international regulations or restrictions are applicable. No special precautions are necessary.

## Section 15: Regulatory Information

Read and understand the manufacturer’s instructions, your employer’s safety practices and the health and safety instructions on the label and the material safety data sheet. Observe all local and federal rules and regulations. Take all necessary precautions to protect yourself and others.

United States EPA Toxic Substance Control Act: All constituents of these products are on the TSCA inventory list or are excluded from listing.

CERCLA/SARA TITLE III: Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs):

<table>
<thead>
<tr>
<th>Ingredient Name</th>
<th>RQ (Lb)</th>
<th>TPQ (Lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products on this SDS are a solid solution in the form of a solid article.</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Spills or releases resulting in the loss of any ingredient at or above its RQ require immediate notification to the National Response Center and to your Local Emergency Planning Committee.

## Section 16: Other Information

The following Risk and Safety Phrase Texts and Hazard Statements correspond with the columns labeled - EU 67/548/EEC within Section 2 of this safety data sheet. Take appropriate precautions and protective measures to eliminate or limit the associated hazard.

### Cadmium Statement:

Cadmium is not a normal contaminant in aluminum alloys and neither it nor any of its compounds are used in the manufacture of this product.

### EU Directive 67/548/EEC - Risk Phrase Texts

<table>
<thead>
<tr>
<th>EU Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R9</td>
<td>Explosive when mixed with combustible material</td>
</tr>
<tr>
<td>R20/22</td>
<td>Harmful by inhalation and if swallowed</td>
</tr>
<tr>
<td>R24/25</td>
<td>Toxic in contact with skin and if swallowed</td>
</tr>
<tr>
<td>R26</td>
<td>Very toxic by inhalation</td>
</tr>
<tr>
<td>R35</td>
<td>Causes severe burns</td>
</tr>
<tr>
<td>R36/37</td>
<td>Irritating to eyes and respiratory system</td>
</tr>
<tr>
<td>R40</td>
<td>Limited evidence of a carcinogenic effect</td>
</tr>
<tr>
<td>R40/20</td>
<td>Harmful - possible risk of irreversible effects through inhalation</td>
</tr>
<tr>
<td>R42/43</td>
<td>May cause sensitization by inhalation and skin contact</td>
</tr>
</tbody>
</table>

: May cause sensitization by skin contact
: May cause cancer
: Very toxic to aquatic organisms
: May cause long-term adverse effects in the aquatic environment
: Possible risk of impaired fertility

For additional information please refer to the following sources:

**USA:**

- OSHA Publication 2206 "Threshold Limit Values and Biological Exposure Indices, American Conference of Governmental Hygienists (ACGIH), 6500 Glenway Ave., Cincinnati, Ohio 45211, USA.
- NFPA 51B "Standard for Fire Prevention during Welding, Cutting and Other Hot Work" published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169.

**UK:**

- WMA Publication 236 and 237, "Hazards from Welding Fume", "The arc welder at work, some general aspects of health and safety".

**Canada:**

- CSA Standard CAN/CSA-W117.2-01 "Safety in Welding, Cutting and Allied Processes".

**Liability-Disclaimer:** American Filler Metals does not assume liability whatsoever for the accuracy or completeness of the information contained in this SDS. The information contained is accurate to the best of our knowledge. The final suitability of any material is the responsibility of the user. Materials may present unknown hazards and are intended for use by qualified individuals experienced and trained in welding safety.