



## **ZULFI WELDING ELECTRODES FACTORY COMPANY LIMITED**

### **MATERIAL SAFETY DATA SHEET**

MSDS: 316/316L/316H-15

Rev No: 1

#### **SECTION 1**

##### **IDENTIFICATION:**

ZULFI WELDING ELECTRODES FACTORY COMPANY

**Manufacturer Name** : LIMITED  
P.O.Box 65 Al-ZULFI 11932.

**TEL** : 00966 6 4221650.

**FAX** : 00966 6 4224085.

**WEB** : [www.zulfi-sa.com](http://www.zulfi-sa.com)

**Product Type** : Stainless Steel Electrodes for Shielded Metal Arc Welding

**Brand Name** : ZULFI E316/316L/316H-15

**AWS Classification** : AWS SFA 5.4 E316/316L/316H-15

#### **SECTION 2**

##### **HAZARDOUS INGREDIENTS**

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding which the normal use of this product is covered by Section 7. The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200) and does not necessarily imply the existence of any hazard.

| INGREDIENTS        | CAS NO     | APPROX WT% | HAZARD CLASSIFICATION                       |
|--------------------|------------|------------|---------------------------------------------|
| Manganese          | 7439-96-5  | 2-4        | No                                          |
| Silicon            | 7440-21-3  | ≤0.50      | No                                          |
| Calcium Carbonate  | 1317-65-3  | 3-10       | No                                          |
| Cryolite           | 13775-53-6 | 1-5        | H332;H302;H362;H411                         |
| Mineral Silicates  | 14808-60-7 | 3-8        | No                                          |
| Nickel             | 7440-02-0  | 8-12       | Carc.<br>Cat:R45;T:R40;R52/R53;<br>T;R48/23 |
| Potassium Silicate | 1312-76-1  | ≤10        | No                                          |
| Sodium Silicate    | 1344-09-8  | ≤5         | No                                          |
| Titanium dioxide   | 13463-67-7 | 8-13       | No                                          |
| Iron               | 7539-96-5  | 45-50      | No                                          |
| Chromium           | 7440-50-8  | 14-30      | No                                          |
| Molybdenum         | 231-107-2  | ≤1.0       | No                                          |
| Mica               | 12068-40-5 | 0.5-1.0    | No                                          |
| Copper             | 7440-50-8  | ≤0.50      | No                                          |

### **Hazard Classification according to European Council Directive 67/548/EEC.**

**Note:** R40 – Limited evidence of a carcinogenic effect. R43 – May cause sensitization by skin contact. R45 – May cause cancer. R48/23 – Toxic: danger of serious damage to health by prolonged exposure through inhalation. R52/53 – Harmful to aquatic organisms may cause long-term adverse effects in the aquatic environment.

## **SECTION 3**

### **PHYSICAL AND CHEMICAL CHARACTERISTICS**

Appearance : Solid, non-volatile with varying color.  
Melting Point : >1300°C/>2300°F

## **SECTION 4**

### **FIRE AND EXPLOSIVE DATA HAZARD**

Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, non-explosive 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 5**

### **FIRST AID MEASURES**

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

**EYE/SKIN INJURIES:** For radiation burns, see physician.

## **SECTION 6**

### **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 7**

### **HEALTH AND SAFETY DATA**

Effect of Overexposure - Electric arc welding may create one or more the following health hazards.

Fumes and Gases can be dangerous to your health. Primary Route of Entry is the respiratory system, eyes and/or skin. Aggravation of respiratory or allergic conditions may affect some exposed individuals.

Short-term (acute) Overexposure may result in discomfort such as metal fume fever, dizziness, nausea or dryness or irritation of nose, throat or eyes. May aggravate pre-existing respiratory problems (e.g., asthma, emphysema).

Long-term (chronic) Overexposure to welding fumes can lead to siderosis (iron products in lungs) and believed by some investigators to affect pulmonary function.

Arc rays can injure eyes and burn skin.

Electric shock can kill.

## **SECTION 8**

### **TOXOLOGICAL INFORMATION**

Inhalation of welding fumes and gases can be dangerous to your health. Classification of welding fumes is difficult because of varying base materials, coatings, air contamination and processes. The International Agency for Research on Cancer has classified welding fumes as possibly carcinogenic to humans (Group 2B).

**ACUTE TOXICITY:** Overexposure to welding fumes may result in symptoms like metal fume fever, dizziness, nausea, dryness or irritation of the nose, throat or eyes.

**CHRONIC TOXICITY:** Overexposure to welding fumes may affect pulmonary function. Prolonged inhalation of nickel and chromium compounds above safe exposure limits can cause cancer. 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 slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait. Prolonged inhalation of titanium dioxide above safe exposure limits can cause cancer. Inhalable quartz is a respiratory carcinogen; however, the process of welding converts crystalline quartz to the amorphous form which is not considered to be a carcinogen.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Persons with pre-existing impaired lung functions (asthma-like conditions). Persons with a pacemaker should not go near welding and cutting operations until they have consulted their doctor and obtained information from the manufacturer of the device. Respirators are to be worn only after being medically cleared by your company-designated physician.

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

**CARCINOGENICITY:** Chromium VI compounds, nickel compounds and silica (crystalline quartz) are classified as IARC Group 1 and NTP Group K carcinogens. Titanium dioxide compounds are classified as IARC Group 2B carcinogens. Chromium VI compounds, nickel compounds, silica (crystalline quartz) and welding fumes must be considered as carcinogens under OSHA (29 CFR 1910.1200).

## **SECTION 9**

### **PERSONAL PROTECTION**

**VENTILATION:** Use enough ventilation, local exhaust at the arc or both to keep the fumes and gases below the PEL/TLV/OELs 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 the regulatory limits.

**EYE PROTECTION:** Wear helmet or use face shield with filter lens. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others from the weld arc flash.

**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

**SPECIAL PRECAUTIONS:** 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 10**

### **DISPOSAL METHOD**

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 11**

### **TRANSPORT INFORMATION:**

No international regulations or restrictions are applicable.

## **SECTION 12**

### **REGULATORY INFORMATION:**

Read and understand the manufacturer's instructions, your employer's safety practices and the health and safety instructions on the label. Observe any federal and local regulations. Take precautions when welding and protect yourself and others. **WARNING:** Welding fumes and gases are hazardous to your health and may damage lungs and other organs. Use adequate ventilation.

**ELECTRIC SHOCK** can kill. **ARC RAYS** and **SPARKS** can injure eyes and burn skin. Wear correct hand, head, and eye and body protection. All constituents of these products are on the Domestic Substance List (DSL). USA: Under the OSHA Hazard Communication Standard, these products are considered hazardous. These products contain or produce a chemical known to the state of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code § 25249.5 et seq.) United States EPA Toxic Substance Control Act: All constituents of these products are on the TSCA inventory list or are excluded from listing.