



## MATERIAL SAFETY DATA SHEET

### CADWELD<sup>®</sup> Starting Material

*Not Sold Separately*

Inclusive of material types : F20, F80, F33, XF19, F76, RBF, Aluminum MSDS: 328  
Applicable prefixes : CA, SB, PB, XF, ACB, ACC, RBF  
Revision : N  
Issue Date : September 11, 2008  
In accordance with : guidelines 91/155/EEG – NEN ISO 11014-1, 29 CFR 1910.1200, 29 CFR 1926.59, Controlled Products Regulations

#### 1 Identification of the Product and Company

##### Identification of the Product

CADWELD<sup>®</sup> Starting Material

##### Identification of the Company

ERICO International Corporation  
34600 Solon Road  
Solon, Ohio 44139  
(440) 248-0100

ERICO B.V.  
Jules Verneweg 75  
5015 BG Tilburg  
The Netherlands  
31(0)13-5835100

##### Telephone

24-hour response line: Chem Tel 1-800-255-3924  
National Toxicity Information Centre 31 (0)30-2748888 (Attending Physician Only)

#### 2 Composition / Data on Components

##### Description

CADWELD Starting Material is a fine particle exothermic mixture that is utilized in conjunction with CADWELD Welding Materials and CADWELD Ferrous Filler Material. Each unit of CADWELD material contains a minimal amount of Starting Material that is sprinkled over the surface of the welding material or filler material and on the lip of the mating mold. The Starting Material reaction is initiated with a standard flint gun (T320). This reaction provides initiation of the main welding or filler material.

## CADWELD<sup>®</sup> Starting Material

*Not Sold Separately*

### Components

Chemical Component	Chemical Symbol	CAS Number	EINECS Number	EU Risk Phrases
Cuprous Oxide	Cu <sub>2</sub> O	1317-39-1	215-270-7	R22
Cupric Oxide	CuO	1317-38-0	215-269-1	R20 R22
Iron Oxide	Fe <sub>3</sub> O <sub>4</sub>	1309-38-2	235-442-5	Not Applicable
Aluminum	Al	7429-90-5	231-072-3	R 10 R 15

### 3 Hazard Identification

#### Hazard Description

Improper use of the product or inadequate preparation of the conductors, molds or surroundings can result in aggressive reactions. Instruction prints should be followed at all times. If information is missing contact ERICO or visit our web site at [www.erico.com](http://www.erico.com) to obtain proper procedures.

Self-propagating high temperature reaction will occur if heated above ignition temperature

#### Immediate Hazards

Burns from contact with reaction, reaction products, or from hot equipment are possible.

#### Exposure To Reaction Byproducts

A detailed fume analysis was conducted on CADWELD Starting Material. Reaction byproducts were tested for total dust, respirable dust, metals, acids, fluorides, and various elements identified in typical welding fume analysis. All sampling and analysis followed methodologies dictated by the National Institute of Occupational Safety and Health (NIOSH) and by the Occupational Safety and Health Administration (OSHA). A certified Industrial Hygienist did the sample collection and independent labs conducted all analytical work.

Data collected was evaluated and compared to limits set by the American Conference of Governmental Industrial Hygienists (ACGIH) and OSHA. **No** threshold limits are attainable with use of this product as intended.

#### Classification System

The material has been tested by independent facilities in accordance with D.O.T. / U.N. CFR 49 and I.A.T.A. Dangerous Goods Regulations to determine the applicable ratings of this material. The results of testing classify CADWELD Starting Material as a 4.1 flammable solid.

### 4 First Aid Measures

#### General Information

The product produces materials at elevated temperatures. Proper protection should be utilized to avoid contact with hot materials. Standard treatment for burns in the event of contact with reaction by products or hot equipment

**CADWELD<sup>®</sup> Starting Material**  
*Not Sold Separately***Inhalation**

For excessive inhalation of dust, fume, remove from exposure, provide fresh air, and consult a physician.

**Skin contact**

Standard treatment for burns in the event of contact with reaction byproducts or hot equipment.

**Eye contact**

Exposure to powdered metals should be treated by flushing eyes with large amounts of water from the nasal area outward. Consult a physician if irritation persists.

Eye contact with reaction byproducts requires immediate medical attention.

**5 Fire Fighting Measures**

*This product is not sold separately. The following information is provided in regards to the final product making use of Starting Material as its ignition component.*

**Suitable Extinguishing Agents**

Dry sand and/or flooding with large amounts of water. Water application should be at a reasonable distance. Use of hand water buckets or hand storage pumps is not recommended. Molten metal contact with water can cause small pockets of superheated steam.

Suitable extinguishing agents should be used to protect surrounding areas.

**Additional information**

CADWELD Welding Materials and CADWELD Filler Materials are exothermic mixtures, which react to produce hot molten metals with temperatures in excess of 2500°F (1370°C) and small amounts of metal fume and smoke. Ignition temperatures are in excess of 1750°F (950°C). The material is not sensitive to vibrations, shock, or impact and is not subject to any form of spontaneous ignition.

The CADWELD Starting Material self ignites above 455°C (850°F) (Indirect Heating).

In the event that the packaging materials are ignited, the immediate and direct application of large quantities of water will effectively eliminate the spread of fire to the surrounding areas. The ignition of the packaging materials may, in rare cases, lead to ignition. Direct application of a continuous heavy stream of water is recommended.

Ignition of extremely large quantities of exothermic materials may result in large volumes of dense smoke.

**CADWELD<sup>®</sup> Starting Material**  
*Not Sold Separately***6 Accidental Release Measures**

*This product is not sold separately. The following information is provided in regards to the final product making use of Starting Material as its ignition component.*

**Person-Related Safety Precautions**

RESPIRATORY PROTECTION: Normal use precludes use of special protection as material is generally used out of doors, in small quantities and is of short duration.

VENTILATION: Local Exhaust - May be necessary if used in confined space. Special - Use of NIOSH approved respirator for dusts and metal fumes in lieu of local exhaust.

PROTECTIVE GLOVES: Recommended for handling hot equipment.

EYE PROTECTION: Safety glasses recommended and caution to user to avoid direct eye contact with "flash" of light from reaction.

**Measures for Environmental Protection**

Precautions should be taken to prevent hot material and reaction byproducts from contact with combustible materials in surrounding areas.

**Measures for Cleaning/Collecting**

All unused, spilled materials may be swept up for disposal, in accordance with local regulations and guidelines.

**7 Handling and Storage****Handling**

CADWELD Exothermic Welding Materials and Filler Materials are designed for use in CADWELD equipment only. Use of improper or damaged equipment can lead to exposure to molten metal and reaction byproducts, resulting in personal injury.

All product instructions should be followed to ensure proper welding and safety. For additional information, see the American National Standard, Safety In Welding And Cutting, and Z49.1.

**Storage**

CADWELD Electrical Welding Materials and Filler Materials should be stored in a clean, dry and secure location. Storage should include provisions to minimize rough handling, excessive vibration and physical abuse. All outer packages must be stored in accordance with label markings.

If proper storage is maintained, CADWELD Materials do not exhibit any storage or shelf life.

If evidence is present of damaged or contaminated products, these units should not be used.

**CADWELD® Starting Material**  
*Not Sold Separately*

**8 Exposure Control / Personal Protection**

Chemical Component	OSHA PEL	ACGIH TLV	Weight Percent	TSCA Inv.
Cuprous Oxide	Fume 0.2 mg/m <sup>3</sup> Dust 1.0 mg/m <sup>3</sup>	Fume 0.2 mg/m <sup>3</sup> Dust 1.0 mg/m <sup>3</sup>	Not > 25%	Yes
Cupric Oxide	Fume 0.2 mg/m <sup>3</sup> Dust 1.0 mg/m <sup>3</sup>	Fume 0.2 mg/m <sup>3</sup> Dust 1.0 mg/m <sup>3</sup>	Not > 25%	Yes
Iron Oxide	10 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	Not > 20%	Yes
Aluminum	Fume 5.0 mg/m <sup>3</sup> Dust 10.0 mg/m <sup>3</sup>	Fume 5.0 mg/m <sup>3</sup> Dust 10.0 mg/m <sup>3</sup>	Not > 45% Fume or Dust	Yes

**9 Physical and Chemical Properties (CADWELD Exothermic Material)**

**Form:** Powder  
**Color:** Grey-black  
**Odor:** Odorless

BOILING POINT: N/A  
 VAPOR PRESSURE: N/A  
 VAPOR DENSITY: N/A  
 SOLUBILITY IN WATER: Insoluble  
 SPECIFIC GRAVITY (H<sub>2</sub>O=1): 4.0  
 MELTING POINT: @ 1220°F (660°C)  
 EVAPORATION RATE (BUTYL ACETATE=1): N/A  
 FLASH POINT (METHOD USED): Self ignites above 850°F (Indirect Heating) (455°C).  
 FLAMMABLE LIMITS: LEL - N/A UEL - N/A

**10 Stability and Reactivity**

**Thermal Decomposition / Conditions to be Avoided**  
 Temperatures above ignition point. Indirect heating to temperatures above 850°F (455°C).

**Dangerous Reactions**  
 Aggressive reactions are possible if excess moisture is present in the mold or on the conductors to be welded. Care should be taken to ensure proper preparation in accordance with instruction prints.

**Dangerous Decomposition Products**  
 None

**CADWELD<sup>®</sup> Starting Material**  
*Not Sold Separately*

STABILITY: Stable

CONDITIONS TO AVOID: Temperatures above ignition point.

INCOMPATIBILITY (MATERIALS TO AVOID): Typical of problems associated with molten metals.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: None

HAZARDOUS POLYMERIZATION: Will not occur.

**11 Toxicological Information**

The primary route of entry is inhalation or ingestion.

Burns from contact with reaction, reaction byproducts, or from hot equipment are possible. Dust and fumes are an irritant to eyes and upper respiratory tract. Inhalation of high concentrations of freshly formed oxide fumes and dusts in the respirable particle size range can cause influenza-like illness termed metal fume fever. Copper oxide dust may by repeated or prolonged inhalation occasionally cause ulceration and perforation of the nasal septum. Long term exposure to copper containing dusts may cause allergic dermatitis.

**12 Ecological Information**

CADWELD Welding Materials and Filler Materials contain fluorides, copper and copper compounds.

**13 Disposal Considerations**

Disposal must be done in accordance with applicable local, state or federal laws. If data is unavailable, contact ERICO for appropriate disposal recommendations.

**14 Transport Information****General Information**

The product material has been tested by independent facilities in accordance with D.O.T. / U.N. CFR 49 and I.A.T.A. Dangerous Goods Regulations to determine the applicable ratings of this material. Based on the results of this testing, the CADWELD Starting Material is classified as a 4.1 flammable solid.

CADWELD Starting Material is included in the as supplied package in all cases, other than XL, and CADWELD PLUS identified material. This material has been classified through independent laboratory testing as a 4.1 flammable solid. Due to the minimal quantity present per package, this material and the CADWELD Welding Materials and Filler Materials package is shipped under provisions outlined under D.O.T. / U.N. 49 CFR 171.1 "General Regulations for the Transportation of Hazardous Material" and 173.4 "Exceptions for Small Quantities". All materials are packaged and marked at the factory in full compliance with these regulations.

MARINE POLLUTANT: Not Applicable

UN / ID NUMBER: UN3089

PACKAGING GROUP: Class 4

PROPER SHIPPING NAME: Not shipped or sold separately

**CADWELD® Starting Material**  
*Not Sold Separately***15 Regulations****US FEDERAL REGULATIONS**

This product contains compounds which are subject to reporting requirements of Section 313 of Title III of SARA and 40 CFR 372.

Components of the material are also included on the TSCA inventory list and are identified in section 8 above.

**INTERNATIONAL REGULATIONS:****Canadian Workplace Hazardous Materials Information System**

Utilizing information presented in "WHMIS CORE MATERIAL, A RESOURCE MANUAL FOR THE APPLICATION AND IMPLEMENTATION OF WHMIS" Worker's Compensation Board of British Columbia, Richmond, BC CADWELD and CADWELD PLUS materials would be considered Division 2 Class D Sub Division B.

**16 Other Information**

The information supplied in this document is provided with the best of our knowledge and in good faith. If the information required does not appear on this MSDS, please contact the ERICO at the numbers identified in Section 1 for assistance.