

SAFETY DATA SHEET

Product name:	CADWELD® Starting Material	Page:	1/12
Supersedes date:	2013-02-19	Revision:	2015-07-21
SDS-ID:	CADWELD_SM_US	Version number:	US-EN/3.1

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Product name: CADWELD® Starting Material
Inclusive of material types: F20, F80, F33, XF19, F76, RBF, Aluminum.
Applicable prefixes: CA, SB, PB, XF, ACB, ACC, RBF

Relevant identified uses of the substance or mixture and uses advised against

Application: Exothermic Welding material

Details of the supplier of the safety data sheet

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

Emergency telephone number

Emergency telephone: Chemtel
1-800-255-3924 USA
+01-813-248-0585 International

SAFETY DATA SHEET

Product name:	CADWELD® Starting Material	Page:	2/12
Supersedes date:	2013-02-19	Revision:	2015-07-21
SDS-ID:	CADWELD_SM_US	Version number:	US-EN/3.1

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

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.

OSHA 2012: Flammable Solid, category 2;H228 - Acute Toxicity, category 4;H302

Label elements



WARNING

H228	Flammable solid.
H302	Harmful if swallowed.
P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260	Do not breathe dust/fume
P280	Wear eye protection and gloves.
P301 + P312	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P273	Avoid release to the environment.
P501	Dispose of contents/container in accordance with local regulations.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P330	Rinse mouth.

Other hazards

Other: Improper use of the product or inadequate preparation of the conductors, molds or surroundings can result in aggressive reactions. Self-propagating high temperature reaction will occur if heated above ignition temperature. Generates molten metal in excess of 2500°F (1370°C), slag and dense, dusty smoke. The molten product can cause serious burns. Inhalation of powder or fumes may cause metal fume fever. Exposure to reaction by-products: See section 8.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixtures

Only classified substances above threshold limits are shown.

SAFETY DATA SHEET

Product name: CADWELD® Starting Material Page: 3/12
Supersedes date: 2013-02-19 Revision: 2015-07-21
SDS-ID: CADWELD_SM_US Version number: US-EN/3.1

OSHA 2012:

<u>%:</u>	<u>CAS-No.:</u>	<u>EC No.:</u>	<u>REACH Reg. No:</u>	<u>Chemical name:</u>	<u>Hazard classification:</u>	<u>Notes:</u>
30-60	7429-90-5	231-072-3	01-2119529243-45-	Aluminium powder (stabilised)	Water-react. 2;H261 Flam. Sol. 1;H228	
1-30	1317-38-0	215-269-1	01-2119502447-44-	Copper oxide	Acute Tox. 4;H302 Aquatic Acute 1;H400 Aquatic Chronic 3;H412	M = 1
1-<25	1317-39-1	215-270-7	01-2119513794-36-	Dicopper oxide	Acute Tox. 4;H302 Aquatic Acute 1;H400 Aquatic Chronic 1;H410	M = 1

Notes: M: M-Factor

References: The full text for all hazard statements is displayed in section 16.

SECTION 4: FIRST AID MEASURES

Description of first aid measures

Molten product will cause skin burns and if in contact with eyes while in a molten state may cause serious damage.

Inhalation: Inhalation of welding fumes/Dust inhalation: Move into fresh air and keep at rest. In case of persistent throat irritation or coughing: Seek medical attention and bring these instructions.

Skin contact: Remove contaminated clothes and rinse skin thoroughly with water. If material is hot, treat for thermal burns and get immediate medical attention.

Eye contact: Dust in the eyes: Do not rub eye. Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyelids widely. If irritation persists: Seek medical attention and bring these instructions.

Ingestion: Immediately rinse mouth and drink plenty of water. Keep person under observation. If person becomes uncomfortable seek hospital and bring these instructions.

Most important symptoms and effects, both acute and delayed

Symptoms/effects: Inhalation of powder or fumes may cause metal fume fever. Symptoms like headache, fatigue and nausea may appear. See section 11 for more detailed information on health effects and symptoms.

Indication of any immediate medical attention and special treatment needed

Medical attention/treatments: Burns (in contact with molten metal, slag or hot equipment): Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital.

SAFETY DATA SHEET

Product name:	CADWELD® Starting Material	Page:	4/12
Supersedes date:	2013-02-19	Revision:	2015-07-21
SDS-ID:	CADWELD_SM_US	Version number:	US-EN/3.1

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Extinguishing media: Extinguish with dry sand and/or flood with large amounts of water.

Extinguishing media which are not suitable: Hand water buckets or hand storage pumps. Molten metal contact with water can cause small pockets of superheated steam.

Use fire-extinguishing media appropriate for surrounding materials.

Special hazards arising from the substance or mixture

Specific hazards: During fire, health hazardous gases may be formed.
Ignition temperature: 850°F

The ignition of the packaging materials may, in rare cases, lead to ignition. Direct application of water is not recommended. This product makes use of fine grade aluminums that have the potential to have adverse chemical reactions if exposed to large volumes of water. These reactions can result in evolution of hydrogen gas that can significantly increase fire intensity and potential "explosion" hazards.

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

Advice for firefighters

Protective equipment for fire-fighters: Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions: Avoid inhalation of dust. Do not breathe fumes. Avoid contact with skin and eyes. Follow precautions for safe handling described in this safety data sheet.

Remove sources of ignition. Ventilate well.

Environmental precautions

Environmental precautions: Precaution should be taken to prevent hot material and reaction byproducts from contact with combustible materials in surrounding areas. Avoid spreading dust or contaminated materials. Avoid discharge to the aquatic environment. Contact local authorities in case of spillage to drain/aquatic environment.

Methods and material for containment and cleaning up

Spill Cleanup Methods: Remove sources of ignition. Sweep up spilled substance and remove to safe place.
For large spills use natural fiber brush or broom with a conductive, non-sparking pan.

Reference to other sections

References: For personal protection, see section 8. For waste disposal, see section 13.

SAFETY DATA SHEET

Product name:	CADWELD® Starting Material	Page:	5/12
Supersedes date:	2013-02-19	Revision:	2015-07-21
SDS-ID:	CADWELD_SM_US	Version number:	US-EN/3.1

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Safe handling advice: Avoid inhalation of dust. Do not breathe fumes. Avoid contact with skin and eyes. Observe good chemical hygiene practices. 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.

Technical measures: Do not smoke or use open fire or other sources of ignition. Work practice should minimize risk of contact. All product instructions should be followed to ensure proper welding and safety. For additional information, see American National Standard, Safety In Welding And Cutting, and Z49.1.

Technical precautions: Confined space: Local exhaust is recommended.

Conditions for safe storage, including any incompatibilities

Technical measures for safe 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. Follow the rules for storage of flammable products.

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

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

Specific end use(s)

Specific use(s): Welding material

SAFETY DATA SHEET

Product name: CADWELD® Starting Material Page: 6/12
Supersedes date: 2013-02-19 Revision: 2015-07-21
SDS-ID: CADWELD_SM_US Version number: US-EN/3.1

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

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.

Occupational exposure limits:

<u>CAS-No.:</u>	<u>Chemical name:</u>	<u>As:</u>	<u>Exposure limits:</u>	<u>Type:</u>	<u>Notes:</u>	<u>References:</u>
7429-90-5	Aluminum, metal, respirable fraction	Al	5 mg/m3	TWA	-	OSHA
7429-90-5	Aluminum, metal, total dust	Al	15 mg/m3	TWA	-	OSHA
7429-90-5	Aluminum metal, respirable fraction	-	1 mg/m3	TWA	A4	ACGIH
7440-50-8	Copper, dusts and mists	Cu	1 mg/m3	TWA	-	OSHA
7440-50-8	Copper dusts and mists	Cu	1 mg/m3	TWA	-	ACGIH
7440-50-8	Copper, fume	-	0.2 mg/m3	TWA	-	ACGIH
7440-50-8	Copper, fume	Cu	0.1 mg/m3	TWA	-	OSHA
1309-37-1	Iron oxide fume	-	10 mg/m3	TWA	-	OSHA
-	Iron oxide (Fe2O3), respirable fraction	-	5 mg/m3	TWA	A4	ACGIH

Notes: A4: Not Classifiable as a Human Carcinogen.

Exposure controls

Engineering measures: Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of dust and fumes.

Personal protection: Personal protection equipment should be chosen according to the relevant standards and in discussion with the supplier of the personal protective equipment. Use special welding equipment for protection of eyes, skin and respiratory system.

Respiratory equipment: Normal use precludes use of special protection as material is generally used out of doors, in small quantities and is of short duration. In case of inadequate ventilation and work of long duration or on large surface areas in confined rooms. Wear suitable respiratory equipment for dusts and metal fumes.

Hand protection: Heat insulated protective gloves. Recommended for handling hot equipment.

Eye protection: Wear goggles/face shield. Avoid direct eye contact with "flash" of light from reaction.

Skin protection: Use protective clothing, which covers arms and legs.

Hygiene measures: Wash hands after handling. Change contaminated clothing.

SAFETY DATA SHEET

Product name: CADWELD® Starting Material
Supersedes date: 2013-02-19
SDS-ID: CADWELD_SM_US

Page: 7/12
Revision: 2015-07-21
Version number: US-EN/3.1

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Form: Powder
Color: Gray-black
Odor: Odorless.
pH: Not available.
Melting point / freezing point: 1220°F
Boiling point: Not available.
Evaporation rate: Not relevant.
Vapor pressure: Not relevant.
Vapor density: Not relevant.
Solubility: Insoluble in water
Partition coefficient (n-octanol/water): Not available.
Auto-ignition temperature (°C): >850°F
Decomposition temperature (°C): Not available.
Viscosity: Not relevant.
Explosive properties: Not available.
Oxidizing properties: Not available.
Other information
Other data: SPECIFIC GRAVITY (water=1): 4.0

SAFETY DATA SHEET

Product name:	CADWELD® Starting Material	Page:	8/12
Supersedes date:	2013-02-19	Revision:	2015-07-21
SDS-ID:	CADWELD_SM_US	Version number:	US-EN/3.1

SECTION 10: STABILITY AND REACTIVITY

Reactivity

Reactivity: See hazardous reactions.

Chemical stability

Stability: Stable. Not sensitive to vibrations, shock or impact and is not subject to spontaneous ignition.

Possibility of hazardous reactions

Hazardous 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.

Conditions to avoid

Conditions/materials to avoid: Temperatures above ignition point. 850°F

Incompatible materials

Incompatible materials: Typical of problems associated with molten metals.

Hazardous decomposition products

Hazardous decomposition products: None under normal conditions. Polymerization will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhalation: Dust may irritate throat and respiratory system and cause coughing. Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain.

Skin contact: Dust has an irritating effect on moist skin. Prolonged and/or repeated contact: May cause eczema-like skin disorders (dermatitis). The molten product can cause serious burns.

Eye contact: Particles/fumes in the eyes may cause discomfort/irritation.

Ingestion: Ingestion may cause nausea, headache, dizziness and intoxication.
Dicopper oxide: LD50 > 500 mg/kg

Specific effects: Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases. Copper oxide 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.
This product contains no ingredient listed on the NTP, OSHA or IARC carcinogen lists.

SAFETY DATA SHEET

Product name:	CADWELD® Starting Material	Page:	9/12
Supersedes date:	2013-02-19	Revision:	2015-07-21
SDS-ID:	CADWELD_SM_US	Version number:	US-EN/3.1

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Ecotoxicity: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Dicopper oxide: EC50 (Daphnia magna, 48 hours): 0.51 mg/l

Persistence and degradability

Degradability: The product solely consists of inorganic compounds which are not biodegradable.

Bioaccumulative potential

Bioaccumulative potential: No data available on bioaccumulation.

Mobility in soil

Mobility: The product is not volatile but may be spread by dust-raising handling.

Results of PBT and vPvB assessment

PBT/vPvB: This product does not contain any PBT or vPvB substances.

Other adverse effects

Other adverse effects: None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Dispose of waste and residues in accordance with local authority requirements.

SAFETY DATA SHEET

Product name:	CADWELD® Starting Material	Page:	10/12
Supersedes date:	2013-02-19	Revision:	2015-07-21
SDS-ID:	CADWELD_SM_US	Version number:	US-EN/3.1

SECTION 14: TRANSPORT INFORMATION

Not shipped or sold separately

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.

UN number

UN-No: 3089

UN proper shipping name

Proper Shipping Name: METAL POWDER, FLAMMABLE, N.O.S. (Aluminum powder (stabilized))

Transport hazard class(es)

Class: 4.1

Packing group

PG: II

Environmental hazards

Marine pollutant: -

Environmentally Hazardous substance: -

Special precautions for user

Special precautions: -

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Transport in bulk: -

SAFETY DATA SHEET

Product name:	CADWELD® Starting Material	Page:	11/12
Supersedes date:	2013-02-19	Revision:	2015-07-21
SDS-ID:	CADWELD_SM_US	Version number:	US-EN/3.1

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

Special provisions: State and local regulation may apply.

TSCA: The ingredients of this product are on the TSCA Inventory.
SARA Section 302: No
SARA Section 313: Yes

NFPA Rating: Health:2 Fire:1 Reactivity:1 Other:-
HMIS Rating: Health:2 Fire:1 Reactivity:1 Personal protection:B

B = Safety Glasses and Gloves.

National regulation:

The following lists have been checked:
Threshold Limit Values (2014), ACGIH, by the American Conference on Governmental Industrial Hygienists.
The Code of Federal Regulation, Title 29, part 1910. Occupational Safety and Health Standards, Air contaminants (OSHA), with amendments.
NIOSH Pocket Guide to Chemical Hazards.
The Code of Federal Regulation, Title 29, part 1910. Occupational Safety and Health Standards, Hazard Communication, with amendments.
U.S. Department of health and human services: 2014 - Report on Carcinogens - 13th Edition.
International Agency for Research on Cancer (IARC): IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Lyon: IARC, World Health Organization.
Threshold Limit Values (2015), ACGIH, by the American Conference on Governmental Industrial Hygienists.
The Code of Federal Regulation. Title 40, part 355.50. Emergency Planning and Notification.
The Code of Federal Regulation. Title 40, part 372.65. Toxic Chemical Release Reporting: Community Right to Know.

Chemical Safety Assessment in compliance with Regulation (EC) No 1907/2006 (REACH)

CSA status: Not relevant.

SAFETY DATA SHEET

Product name:	CADWELD® Starting Material	Page:	12/12
Supersedes date:	2013-02-19	Revision:	2015-07-21
SDS-ID:	CADWELD_SM_US	Version number:	US-EN/3.1

SECTION 16: OTHER INFORMATION

The user must be instructed in the proper work procedure and be familiar with the contents of these instructions.

The following sections contain revisions or new statements: 2, 3, 4, 7, 13, 14, 15, 16.

Abbreviations and acronyms PBT = Persistent, Bioaccumulative and Toxic.
used in the safety data sheet: vPvB = very Persistent and very Bioaccumulative.

Wording of H-statements:

H228	Flammable solid.
H261	In contact with water releases flammable gases.
H302	Harmful if swallowed.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

The information on this data sheet represents our current data and is reliable provided that the product is used under the prescribed conditions and in accordance with the application specified on the packaging and/or in the technical guidance literature. Any other use of the product which involves using the product in combination with any other product or any other process is the responsibility of the user.
