

SAFETY DATA SHEET

Rail Welding Thermit[®]

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Thermit[®] Welding Powder
SYNONYMS: Thermite portion, Thermite reaction, Thermite powder, Alumino-thermic reaction, Goldschmidt reaction, Thermite welding, Exothermic welding

MANUFACTURER: **ORGO-THERMIT, Inc.**
DIVISION: **A Member of the Goldschmidt-Thermit-Group**
ADDRESS: 3500 Colonial Drive North; Manchester, NJ 08759

EMERGENCY PHONE: (800) 424-9300 (CHEMTREC USA Assistance)
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CHEMICAL NAME: Exothermic reaction mixture
CHEMICAL FAMILY: Metals
CHEMICAL FORMULA: $\text{Fe}_2\text{O}_3 + 2 \text{Al} \Rightarrow 2 \text{Fe} + \text{Al}_2\text{O}_3 + \text{heat}$

PRODUCT USE: In-situ welding of steel rail road tracks
PREPARED BY: Orgo-Thermit, Inc.

SECTION 1 NOTES:

A coarse granular mixture of Aluminum, Iron Oxide Powder, Steel, and Solid Metal Alloy additions.

SECTION 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

WARNING! May be harmful if inhaled. May irritate the eyes, skin, and respiratory tract. Molten material may cause thermal burns. Molten steel is hazardous.

MATERIAL DESCRIPTION:

Mixture of silver, black, brown, red, and gray granules with no odor.
CAUTION! Combustible Solid

SECTION 2 NOTES:

This material is not considered hazardous by the OSHA Hazard Communications Standard, if properly used.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	CAS NO.	% WT
Ferric Oxide	1309-37-1	proprietary
Aluminum Powder (uncoated)	7429-90-5	proprietary
Ferro Manganese	12604-53-4	proprietary
Ferro Vanadium	12604-58-9	proprietary
Silica Oxide	14808-60-7	proprietary
Mild Steel	7439-89-6	proprietary

SECTION 3 NOTES:

This section covers ingredients contained in the product as shipped. The product shipped will consist mostly of solid pieces of metal with some dust present. Some elements may not be present in some shipments.

Weight percentages are considered trade secrets, and thus, are not disclosed.

SAFETY DATA SHEET

Rail Welding Thermit®



SECTION 4: FIRST AID MEASURES

POTENTIAL HEALTH EFFECTS

EYE CONTACT:

Dust or particulates may cause irritation including pain, tearing, and redness. Scratching of the cornea can occur if eye is rubbed. Fumes may be irritating. Contact with the heated material will cause thermal burns.

SKIN CONTACT:

Dust or particulates may cause irritation due to abrasion. Some components in this product are capable of causing an allergic reaction, possibly resulting in itching and skin eruptions. Diseases of the skin, such as eczema, may be aggravated by exposure. Contact with heated material will cause thermal burns.

INGESTION:

Not expected to be acutely toxic via ingestion based on the physical and chemical properties of the product. Swallowing excessive amounts of dust may cause irritation, nausea, and diarrhea.

INHALATION:

Dust may cause irritation of the nose, throat, and lungs. Excessive inhalation of metallic fumes and dust may result in metal fume fever, an influenza-like illness. It is characterized by a sweet or metallic taste in the mouth, accompanied by dryness and irritation of the throat. Other symptoms include coughing, shortness of breath, pulmonary edema, general malaise, weakness, fatigue, muscle and joint pain, blurred vision, fever and chills. Typically symptoms will last 12 - 48 hours. Disorders of the respiratory system including asthma, bronchitis, and emphysema may be aggravated by exposure.

FIRST AID TREATMENT

EYE CONTACT:

In case of overexposure to dust or fumes, immediately flush eye with plenty of water for at least 15 minutes; occasionally lifting the eyelids. Get medical attention if irritation persists. Thermal burns should be treated as medical emergencies.

SKIN CONTACT:

In case of overexposure to dust or particulates, wash with soap and plenty of water. Get medical attention if irritation develops or persists. If thermal burn occurs, seek immediate medical attention.

INGESTION:

Not considered an ingestion hazard. However, if excessive amounts of dust or particulates are swallowed, treat symptomatically and supportively. Get medical attention.

INHALATION:

In case of overexposure to dust or fumes, move to fresh air. Get immediate medical attention if any symptoms listed above (Potential Health Effects) develop.

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS:

Inhalation of metal fume or metal oxides may produce an acute febrile state, with cough, chills, weakness, and general malaise. Nausea, vomiting, muscle cramps, and remarkable leukocytosis can develop. Treatment is symptomatic, and condition is self limited in 24 – 48 hours. Chronic exposure to dusts may result in pneumoconiosis of mixed type.

SAFETY DATA SHEET

Rail Welding Thermit®



SECTION 5: FIRE-FIGHTING MEASURES

FLAMMABLE LIMITS: Not available.

FLASH POINT: Not available.

AUTOIGNITION TEMPERATURE: > 1830°F / 999°C

NFPA HAZARD CLASSIFICATION

HEALTH: 1 **FLAMMABILITY:** 1 **REACTIVITY:** 0

OTHER: Use No Water.

Note: NFPA classifications are 0 - 4, with 4 as the most severe.



HMIS HAZARD CLASSIFICATION

HEALTH: 1 **FLAMMABILITY:** 1 **REACTIVITY:** 0

PROTECTION: Safety glasses, gloves, dust respirator recommended.

Note: HMIS classifications are 0 - 4, with 4 as the most severe.

HMIS	
HEALTH	1
FLAMMABILITY	1
REACTIVITY	0
PPE	E

EXTINGUISHING MEDIA:

Do NOT use water, carbon dioxide, or foam. Metal dust fires need to be smothered with sand or inert dry powder. Use a dry chemical or dry silica sand to extinguish fire. Contact professional fire fighters. If impossible to extinguish, withdrawal from area, protect surroundings, and allow fire to burn itself out.

SPECIAL FIRE FIGHTING PROCEDURES:

Fire fighters should wear full fire fighting turn-out gear and respiratory protection (self contained breathing apparatus). Combustible solid. Material is not sensitive to mechanical impact or static discharge.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

After ignition, the chemical reaction cannot be halted. May burn rapidly with flare burning effect. Molten slag and steel are produced – stay clear when reaction takes place. Reaction can reach over 4500°F / 2500°C.

HAZARDOUS DECOMPOSITION PRODUCTS:

When heated to decomposition, acid fumes are emitted. Do NOT use water or foam, as generation of explosive hydrogen may result. Chemical reaction with carbon dioxide may produce flammable and explosive methane.

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES:

Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Sweep up spill and place in sealed bag or container for disposal. Wash spill area after pick up is complete.

SECTION 6 NOTES:

Use proper personal protective equipment as indicated in Section 8.

SAFETY DATA SHEET

Rail Welding Thermit®



SECTION 7: HANDLING AND STORAGE

HANDLING:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Minimize dust generation and accumulation. Avoid inhalation and ingestion.

STORAGE:

Store in a cool, dry, well ventilated and locked storeroom away from incompatible materials. Store in general storage area with other items. No specific storage hazards.

OTHER PRECAUTIONS:

DO NOT USE material that got wet for rail welding. Wet Thermit® Welding Powder that is ignited will react violently.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

INGREDIENT	ACGIH TLV TWA	OSHA PEL	NIOSH
Iron Oxide	5 mg / m ³	15 mg / m ³ (total) 5 mg / m ³ (resp)	<10 mg / m ³
Aluminum	1 mg / m ³	15 mg / m ³ (total) 5 mg / m ³ (resp)	10 mg / m ³ (total) 5 mg / m ³ (resp)
Alloying Elements:			
Manganese	0.2 mg / m ³	5 mg / m ³	1 mg / m ³ (time weighted average)
Ferro Vanadium	1 mg / m ³	1 mg / m ³	1 mg / m ³
Silica Oxide	0.025 mg / m ³	12.7 mg / m ³ (total) 4.25 mg / m ³ (resp)	0.05 mg / m ³ (total)

NOTE:

No permissible exposure limits (PEL) or threshold limit values (TLV) exist for steel nor Thermit® Welding Powder. The above listing is a summary of elements used in alloying Orgo-Thermit Inc product. Various grades of Thermit® Welding Powder will contain different combinations of the elements and/or trace materials.

ENGINEERING CONTROLS:

When using Thermit® Welding Powder, preventive fire protection measures should be employed to protect surrounding areas from catching fire. Depending on proximity and wind conditions, sparks could catch nearby items on fire. It is recommended to keep a chemical fire extinguisher and water supply nearby.

VENTILATION :

Use local exhaust ventilation, or other engineering controls, to keep airborne levels below the recommended exposure limits.

RESPIRATORY PROTECTION:

Use a NIOSH/MSHA approved respirator with a dust cartridge if exposure limits are exceeded, or if irritation or other symptoms are experienced.

EYE PROTECTION:

Safety glasses should be used when handling the powder. When igniting Thermit® Welding Powder, shade 5 welding eye protection is recommended until the welding process is completed.

SAFETY DATA SHEET

Rail Welding Thermit®



SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION (cont.)

SKIN PROTECTION:

Wear appropriate protective clothing, shoes, and gloves to prevent skin exposure. When igniting Thermit® Welding Powder, protect skin from high temperatures. Welding gloves, jackets, pants, bibs, or aprons are used during the welding process.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:

Faceshields and hard hats are used to protect users from sparks during the welding and grinding processes.

SECTION 8 NOTES:

Information concerning hazardous exposure limits has been compiled from sources considered to be reliable and is accurate and reputable to the best of our knowledge and belief but is not guaranteed to be so.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Granular mixture, gray in color
ODOR: Odorless
PHYSICAL STATE: Solid

pH AS SUPPLIED: Not Applicable
BOILING POINT: Not Applicable
MELTING POINT: > 1220°F / 660°C
FREEZING POINT: Not Applicable
VAPOR PRESSURE (mmHg): Not Applicable
VAPOR DENSITY (AIR = 1): Not Applicable
SPECIFIC GRAVITY (H₂O = 1): > 1 g/mL @ 20°C
EVAPORATION RATE: Not Applicable
SOLUBILITY IN WATER: Insoluble
WEIGHT PERCENT SOLIDS: 100% Solids
PERCENT VOLATILE: Not Available
MOLECULAR WEIGHT: Not Available
VISCOSITY: Not Applicable

SECTION 10: STABILITY AND REACTIVITY

STABILITY: **STABLE** **UNSTABLE**

CONDITIONS TO AVOID (STABILITY): Does not spontaneously ignite.
INCOMPATIBILITY (MATERIAL TO AVOID): Reacts with acids and caustic solutions to produce hydrogen.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Can produce hydrogen when exposed to caustic solutions or acid.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID (POLYMERIZATION): Not applicable.

SECTION 10 NOTES:

Avoid heat and moisture. Shelf life is indefinite if stored properly.

SAFETY DATA SHEET

Rail Welding Thermit®



SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE SYMPTOMS / SIGNS OF EXPOSURE:

EYES: Redness, tearing, itching, burning, conjunctivitis.
SKIN: Redness, itching
INGESTION: Irritation and burning sensation of mouth and throat, nausea, vomiting, and abdominal pain.
INHALATION: Irritation of mucous membranes, coughing, wheezing, shortness of breath.

CHRONIC EFFECTS: None expected.

SENSITIZATION: None expected.

TOXICITY TO ANIMALS: Thermit® Welding Powder: LD 50 [oral, rat]: Not applicable
LC 50 [rat]: Not applicable
LD 50 [dermal, rabbit]: Not applicable

SECTION 11 NOTES:

Material has not been found to be a carcinogen nor produce genetic, reproductive, or developmental effects.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY (AQUATIC AND TERRESTRIAL): Ecological impact has not been determined.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:

Check with all applicable local, regional, and national laws and regulations. Local regulations may be more stringent than regional or national regulation.

RCRA HAZARD CLASS:

None listed.

SAFETY DATA SHEET

Rail Welding Thermit®



SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION

PROPER SHIPPING NAME: THERMIT
HAZARD CLASS: NOT APPLICABLE
ID NUMBER: 50390
PACKING GROUP: NOT APPLICABLE
LABEL STATEMENT: ITEM#50390 CLASS 55

WATER TRANSPORTATION

PROPER SHIPPING NAME: THERMIT
HAZARD CLASS: NOT APPLICABLE
ID NUMBER: 50390
PACKING GROUP: NOT APPLICABLE
LABEL STATEMENTS: ITEM#50390 CLASS 55

AIR TRANSPORTATION

PROPER SHIPPING NAME: THERMIT
HAZARD CLASS: NOT APPLICABLE
ID NUMBER: 50390
PACKING GROUP: NOT APPLICABLE
LABEL STATEMENTS: ITEM#50390 CLASS 55

CANADA TDG: Not regulated.

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

EPCRA Section 302 – Extremely Hazardous Substances:

None listed.

CERCLA - Hazardous Substances:

None listed.

EPCRA Section 313 – Toxic Chemicals:

CAS # 7429-90-5, Aluminum, is on the list as a fume or dust.

CAA 112(r) - Regulated Chemicals for Accidental Release Prevention:

None listed.

EPA TSCA Section 8(b) – Chemical Inventory:

CAS # 7429-90-5, Aluminum, is on the list.

CAS # 1309-37-1, Iron Oxide, is on the list.

STATE REGULATIONS:

New Jersey Right to Know Hazardous Substance List:

CAS # 1309-37-1, Iron Oxide, is on the list.

CAS # 12604-58-9, Ferro Vanadium, is on the list.

CAS # 14808-60-7, Silica - Quartz, is on the list.

California Proposition 65 List of Chemicals:

Crystalline silica is on the list.

INTERNATIONAL REGULATIONS:

The product has been classified in accordance with the hazard criteria of the Controlled Products Regulations. The Safety Data Sheet contains all the information required by the Controlled Products Regulations.

SAFETY DATA SHEET

Rail Welding Thermit[®]



SECTION 16: OTHER INFORMATION

PREPARATION INFORMATION: Last revised February 4, 2014.

DISCLAIMER:

Orgo-Thermit Inc. believes that the information herein is factual but is not intended to be all inclusive. The information relates only to the specific material designated and does not relate to its use in combination with other materials or its use as to any particular process. Because safety standards and regulations are subject to change and because Orgo-Thermit has no continuing control over such changes; those handling, storing, or using the material should satisfy themselves that they have current information regarding the particular way the material is handled, stored, used, or disposed of, and that the same is done in accordance with federal, state, and local law. Orgo-Thermit Inc. makes no warranty, expressed or implied, including (without limitation) warranties with respect to the completeness or continuing accuracy of the information contained herein, or with respect to fitness for any particular use.