MEMBER OF GOLDSCHMIDT THERMIT GROUP

SAFETY DATA SHEET

Starter

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Thermit® Welding Powder Starter
SYNONYMS: Initiator, Portion Starter, Portion Initiator, Starter

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)
(613) 424-6666 (CANUTEC Canada Assistance)
OTHER CALLS: (732) 657-5781
FAX: (732) 657-5899

PRODUCT USE: The product is used to initiate the alumino-thermic reaction used for rail track welding and is ignited by an electronic ignition system.

SECTION 2: HAZARDS IDENTIFICATION

HAZARD CLASSIFICATION:

Acutely Toxic Category 4

The product is a mixture of chemicals that are considered hazardous under the definition in 29 CFR 1910.1200 Hazard Communication Standard. It is classified as an acutely toxic mixture of hazardous chemicals based on the toxicity of several of the components.

SIGNAL WORD:

WARNING

HAZARD STATEMENT:

H242: Heating may cause a fire
H302: Harmful if swallowed
H332: Harmful if inhaled

PICTOGRAMS:

PRECAUTIONARY STATEMENT:

P260: Do not breathe dust/fumes/gas/mist/vapors/spray.
P264: Wash skin thoroughly after handling
P270: Do not eat, drink or smoke when using this product
P273: Avoid release to the environment
P301+P312: IF SWALLOWED Call a POISON CENTER/ doctor/…/if you feel unwell
P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing
P330: Rinse mouth
P501: Dispose of contents/container in accordance with local/regional/national/international regulation

EMERGENCY OVERVIEW:
A self-propagating high temperature reaction will occur if heated above the ignition temperature. The reaction generates molten metal in excess of 2,500F (1,370C) and dense, dusty smoke.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	CAS NO.	% WT
Cupric Oxide	1317-38-0	1-30%
Cuprous Oxide	1317-39-1	25-85%
Calcium Silicide	12775-68-7	<5%
Calcium Fluoride	7789-75-5	<5%
Tin	7440-31-5	<10%
Copper	7440-50-8	1-30%
Aluminum	7429-90-5	1-20%

Exact weight percentages are considered trade secrets, and are not disclosed.

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 from burning material may be irritating. Contact with the heated material will cause thermal burns. Some components are considered serious eye irritants.

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

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.

To remove dust or particulates from the skin, remove contaminated clothing and wash with soap and plenty of water. Get medical attention if irritation develops or persists. If a thermal burn occurs, seek immediate medical attention.

INGESTION:

This product should not be ingested. Cupric oxide, a component of the mixture, is acutely toxic if ingested. Swallowing excessive amounts of dust may cause irritation, nausea, and diarrhea.

Do NOT induce vomiting. Rinse mouth and drink plenty of water. Treat symptomatically and supportively. Get medical attention.

INHALATION:

Some components are toxic to lungs and mucous membranes. 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.

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.

SECTION 5: FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA:

Metal dust fires need to be smothered with dry sand or flooded with large amounts of water from a fire hose. Do not use buckets of water or hand pumps. If fire persists or threatens to spread to surrounding materials, withdrawal from area, and contact fire services.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

After ignition, the chemical reaction cannot be halted. May burn rapidly with flare burning effect. Molten metal is produced – stay clear when reaction takes place. Reaction can reach over 4000^{o}F / 2200^{o}C. Molten metal in contact with small amounts of water may cause pockets of superheated steam that can cause serious burns.

Prevent hot material and reaction byproducts from contact with combustible materials in surrounding areas. In the event that packaging materials are ignited, the immediate and direct application of large quantities of water will effectively eliminate the spread of fire to surrounding areas. The ignition of the packing materials may, in rare cases, lead to ignition of the starter. Direct application of a continuous heavy stream of water is recommended.

HAZARDOUS DECOMPOSITION PRODUCTS:

When heated to decomposition, acid fumes are emitted. Large volumes of dense, irritating smoke will be generated upon ignition.

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. Use conductive, non-sparking tools for cleanup. Wash spill area with large volumes of water after area has been swept.

Avoid inhalation of dust and contact with eyes and skin. Use proper personal protective equipment as indicated in Section 8.

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 clean, dry, well ventilated and secure location away from incompatible materials such as oxidizing agents, acids, and alkalis. If there is evidence of damage or contamination, do not use the product and dispose of appropriately (See Section 13). DO NOT USE Starters for rail welding that show signs of having gotten wet. Using products that have been wet could result in a violent reaction upon ignition.

When stored properly, there is no shelf-life for Starters.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

INGREDIENT	ACGIH TLV	OSHA PEL	NIOSH
Aluminum, metal, respirable fraction	1 mg / m^3	5 mg/ m^3	5 mg / m^3
Aluminum, metal, total dust	ND	15 mg / m^3	10 mg / m^3
Silicon, respirable fraction	ND	5 mg / m^3	5 mg / m^3
Silicon, total dust	ND	15 mg / m^3	10 mg / m^3
Tin, metal	0.1 mg / m^3	2 mg / m^3	2 mg / m^3
Copper, dusts and mists	1 mg / m^3	1 mg / m^3	1 mg / m^3
Copper, fume	0.2 mg / m^3	0.1 mg / m^3	0.1 mg / m^3
Fluorides	2.5 mg / m^3	2.5 mg / m^3	ND

ENGINEERING CONTROLS:
When using Thermit® Welding Powder with starters in an enclosed space, provide adequate ventilation. Use local exhaust ventilation, or other engineering controls, to keep airborne levels below the OHSA exposure limits. Normal use outdoors should not require engineering controls to reduce airborne levels of smoke or fumes.

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 this product. When igniting Thermit® Welding Powder with the starter, shade 5 welding eye protection is recommended until the rail welding process is completed.

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

SECTION 8 NOTES:
A detailed fume analysis was conducted by the supplier of the starters. Air sampling was conducted for combustion byproducts including total dust, respirable dust, metals, acids, fluorides, and various elements identified in typical welding fume analysis. All sampling and analysis followed methodologies established by the National Institute of Occupational Safety and Health (NIOSH) and OSHA. Air samples were collected and analytical results were evaluated by a certified Industrial Hygienist. Sample were analyzed by an independent analytical lab. As a worst case scenario, calculations of airborne concentrations were completed based on a closed 800 ft^2 room with no ventilation. The airborne concentrations when compared to the ACGIH, NIOSH, and OSHA exposure limits indicated that only the copper fume PEL would be approached. Under normal conditions outdoors or in well ventilated enclosed spaces, none of the exposure limits will be exceeded.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Granular mixture, gray, black, or red in color in an aluminum tube.
ODOR:	Odorless
PHYSICAL STATE:	Solid
pH AS SUPPLIED:	Not Applicable
BOILING POINT:	Not Applicable
MELTING POINT:	2000°F / 1093°C
FREEZING POINT:	Not Applicable
VAPOR PRESSURE (mmHg):	Not Applicable
VAPOR DENSITY (AIR = 1):	Not Applicable
SPECIFIC GRAVITY (H2O = 1):	5.5 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
FLAMMABLE LIMITS:	Not Applicable
FLASH POINT:	Not Applicable
AUTOIGNITION TEMPERATURE:	> 1750°F (954C)

SECTION 10: STABILITY AND REACTIVITY

STABILITY: ☒ **STABLE** ☐ **UNSTABLE**

CONDITIONS TO AVOID (STABILITY): Could spontaneously ignite when exposed to moisture and temperatures > 1750°F (954C).

INCOMPATIBILITY (MATERIAL TO AVOID): Reacts with oxidizers, alkalis, and acids.

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

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID (POLYMERIZATION): Not applicable.

SECTION 11: TOXIOLOGICAL INFORMATION

ACUTE SYMPTOMS / SIGNS OF EXPOSURE

EYES: Dust from the mixture or smoke from combustion may cause discomfort or irritation.

SKIN: Dust in contact with moist skin may cause irritation.

INGESTION: Ingestion of the product may cause nausea, headache, dizziness and intoxication.

INHALATION: Inhalation of dust may irritate the throat and respiratory system accompanied with coughing. The product will release metal fumes upon combustion and if inhaled can cause metal fume fever. Immediate symptoms include fever, shivering, malaise, and muscular pain.

CHRONIC EFFECTS:

EYES: None expected

SKIN: Prolonged or repeated contact with dust may cause eczema-like skin disorders (dermatitis).

INGESTION: Irritation and burning sensation of mouth and throat, nausea, vomiting, and abdominal pain.

INHALATION: Frequent or prolonged inhalation of dust increases the risk of developing lung diseases. Specifically, Copper oxides may cause ulceration and perforation of the nasal septum.

SENSITIZATION: None expected.

TOXICITY TO ANIMALS:

INGREDIENT	LD_{50} (mg/kg)
Cupric Oxide	470 (rat)
Cuprous Oxide	1,340 (rat)
Calcium Silicide	No Data
Calcium Fluoride	4,250 (rat)
Tin	80 (rat)
Copper	472 (rat)
Aluminum	>15,900 (rat)

CARCINOGENICITY:

INGREDIENT	OSHA	NTP	IARC
Cupric Oxide	Not listed	Not listed	Not listed
Cuprous Oxide	Not listed	Not listed	Not listed
Calcium Silicide	Not listed	Not listed	Not listed
Calcium Fluoride	Not listed	Not listed	Not listed
Tin	Not listed	Not listed	Not listed
Copper	Not listed	Not listed	Not listed
Aluminum	Not listed	Not listed	Not listed

OSHA = Occupational Safety and Health Agency
NTP = National Toxicology Program
IARC = International Agency for Cancer Research

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY (AQUATIC AND TERRESTIAL):

The mixture of ingredients contained in the product is very toxic to aquatic organisms and may cause long-term adverse effects.

Available aquatic toxicity data

INGREDIENT	Test Organism	EC_{50} (mg/l)
Cuprous Oxide	Daphnia magna	0.51 (48 hours)

PERSISTENCE AND DEGRADABILITY

All ingredients are inorganic chemicals and are not biodegradable

BIOACCUMULATIVE POTENTIAL
No data are available

SOIL MOBILITY

No data are available

RESULTS OF PBT AND vPvB ASSESSMENT

This product does not contain any Persistent Bioaccumulative Toxic (PBT) or Very Persistent, Very Bioaccumulative (vPvB)

OTHER ADVERSE EFFECTS

None known

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:
The product is not a Listed Hazardous Waste. .

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION

PROPER SHIPPING NAME: STARTER FOR REACTION INTIATOR
HAZARD CLASS: NOT APPLICABLE
ID NUMBER: 186870
PACKING GROUP: NOT APPLICABLE
LABEL STATEMENT: ITEM#186870 CLASS 60

WATER TRANSPORTATION

PROPER SHIPPING NAME: STARTER FOR REACTION INTIATOR
HAZARD CLASS: NOT APPLICABLE
ID NUMBER: 186870
PACKING GROUP: NOT APPLICABLE
LABEL STATEMENTS: ITEM#186870 CLASS 60

AIR TRANSPORTATION

PROPER SHIPPING NAME:	STARTER FOR REACTION INTIATOR
HAZARD CLASS:	NOT APPLICABLE
ID NUMBER:	186870
PACKING GROUP:	NOT APPLICABLE
LABEL STATEMENTS:	ITEM#186870 CLASS 60

CANADA TDG: Not regulated.

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

EPCRA Section 302 – Extremely Hazardous Substances:
None listed.
CERCLA - Hazardous Substances:
CAS # 7440-50-8, Copper is listed (5,000 pounds).
EPCRA Section 313 – Toxic Chemicals:
CAS # 7429-90-5, Aluminum, is on the list as a fume or dust.
CAS # 7440-50-8, Copper is listed.
CAA 112(r) - Regulated Chemicals for Accidental Release Prevention:
None listed.

STATE REGULATIONS:

New Jersey Right to Know Hazardous Substance List:
CAS # 7440-31-5, Tin is listed.
CAS # 7440-50-8, Copper is listed.
CAS # 7429-90-5, Aluminum is listed.
California Proposition 65 List of Chemicals:
None listed.

SECTION 16: OTHER INFORMATION

NFPA HAZARD CLASSIFICATION

HEALTH: 2 **FLAMMABILITY:** 2
REACTIVITY: 0
OTHER: Use No Water. **Note:** NFPA classifications are 0 - 4, with 4 as the most severe.

HMIS HAZARD CLASSIFICATION

HEALTH: 2 **FLAMMABILITY:** 2 **REACTIVITY:** 0
PROTECTION: Safety glasses, gloves, dust respirator recommended.
Note: HMIS classifications are 0 - 4, with 4 as the most severe.

HMIS	
HEALTH	2
FLAMMABILITY	2
REACTIVITY	0
PPE	E

PREPARATION INFORMATION: Last revised August 17, 2017.

DISCLAIMER:

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