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**SECTION 1: PRODUCT AND COMPANY IDENTIFICATION**

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**PRODUCT NAME:** Starter Mixture used in Degradable Crucible Cap  
**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)  
(613) 424-6666 (CANUTEC Canada Assistance)  
**OTHER CALLS:** (732) 657-5781  
**FAX:** (732) 657-5899

**PRODUCT USE:** A coarse granular mixture of aluminum metal powder and iron oxide powder used in rail welding.

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**SECTION 2: HAZARDS IDENTIFICATION**

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**HAZARD CLASSIFICATION:**

The product as shipped is not a hazardous chemical as defined in 29 CFR 1910.1200 – Hazard Communication.

**SIGNAL WORD:**

No signal word is required because the product as shipped is not hazardous.

**HAZARD STATEMENT**

No hazard statement is required because the product as shipped is not hazardous.

**PICTOGRAMS:**

No pictograms are required on container labels because the product as shipped is not hazardous.

**PRECAUTIONARY STATEMENT:**

No precautionary statement is required because the product as shipped is not hazardous.

**OTHER HAZARD INFORMATION:**

The smoke produced when ignited may irritate the eyes, skin, an respiratory tract. Molten material produced after plain thermite powder is ignited will cause serious thermal burns.

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**SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

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This section covers ingredients contained in the product as shipped. The product will consist mostly of solid pieces of metal with some dust.

INGREDIENT	CAS NO.	% WT
Ferric Oxide (<1.5 mm)	1309-37-1	Approx. 75%
Aluminum Powder (uncoated) (<0.8mm)	7429-90-5	Approx. 25%

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## **SECTION 4: FIRST AID MEASURES**

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### **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 created when the thermite is ignited may be irritating. Bright light from thermite reaction may cause corneal burns.

If eyes become irritated by dust or fumes, immediately flush eye with plenty of water for at least 15 minutes; occasionally lifting the eyelids. Do not rub eyes. Get medical attention if irritation persists.

Thermal or flash 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 the molten metal will cause severe thermal burns.

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

#### **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.

If excessive amounts of dust or particulates are swallowed, treat symptomatically and supportively. Get medical attention as needed.

#### **INHALATION:**

Dust may cause irritation of the nose, throat, and lungs. Excessive inhalation of metallic fumes from the thermite reaction 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. 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 a fever with cough, chills, weakness, and general malaise develops. Nausea, vomiting, and muscle cramps could develop. Treatment should be symptomatic. This condition is self-limited in 24 – 48 hours.

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## **SECTION 5: FIRE-FIGHTING MEASURES**

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### **EXTINGUISHING MEDIA:**

Do not use water, carbon dioxide, or foam on a fire involving a thermite reaction. Metal dust fires need to be smothered with dry silica sand or dry chemical powder (Class D extinguisher). If impossible to extinguish, call fire department, withdraw from area, protect surroundings, and allow fire to burn itself out.

### **SPECIAL FIRE FIGHTING PROCEDURES:**

Fire fighters should wear full firefighting turn-out gear and self-contained breathing apparatus.

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### UNUSUAL FIRE AND EXPLOSION HAZARDS:

Material is not sensitive to mechanical impact or static discharge. 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 gas may result. Chemical reaction with carbon dioxide may produce flammable methane gas.

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## SECTION 6: ACCIDENTAL RELEASE MEASURES

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### ACCIDENTAL RELEASE MEASURES:

Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Using proper personal protective equipment (Section 8), sweep up the spill and place in a sealed bag or container for disposal. Wash spill area after clean-up is complete.

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## SECTION 7: HANDLING AND STORAGE

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### 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 storeroom away from incompatible materials. Store in general storage area with other items. Avoid heat and moisture. Shelf life is indefinite if stored properly.

### OTHER PRECAUTIONS:

Do not use wet material for rail welding. Wet thermite powder that is ignited will react violently.

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## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

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No permissible exposure limits (PEL) or threshold limit values (TLV) exist for steel nor thermite powder. The listing below is a summary of elements used in the mixture. The exact percentage of alloying metals is considered a trade secret.

INGREDIENT	ACGIH TLV TWA	OSHA PEL	NIOSH
Iron Oxide	5 mg / m <sup>3</sup>	15 mg / m <sup>3</sup> (total) 5 mg / m <sup>3</sup> (resp)	<10 mg / m <sup>3</sup>
Aluminum	1 mg / m <sup>3</sup>	15 mg / m <sup>3</sup> (total) 5 mg / m <sup>3</sup> (resp)	10 mg / m <sup>3</sup> (total) 5 mg / m <sup>3</sup> (resp)

### ENGINEERING CONTROLS:

When using thermite powder, preventive fire protection measures should be employed to protect surrounding areas from catching fire. Depending on proximity and wind conditions, sparks could ignite nearby items. It is recommended to keep a dry chemical fire extinguisher and/or water supply nearby, but water should not be used on the thermite reaction.

### VENTILATION :

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Use local exhaust ventilation, or other engineering controls, to keep airborne levels below the recommended exposure limits if the thermite reaction is initiated in an enclosed space.

**RESPIRATORY PROTECTION:**

Use a NIOSH/MSHA approved respirator with a dust cartridge when handling this product if exposure limits for any of the components are exceeded, or if irritation or other symptoms are experienced. Use a self-contained breathing apparatus if there is exposure to smoke from the thermite reaction or a fire involving the thermite powder.

**EYE PROTECTION:**

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

**SKIN PROTECTION:**

Wear appropriate protective clothing, shoes, and gloves to prevent skin exposure. When igniting thermite powder, protect skin from high temperatures. Welding gloves, jackets, pants, bibs, or aprons should be used during the welding process.

**OTHER PROTECTIVE CLOTHING OR EQUIPMENT:**

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

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**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

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<b>APPEARANCE:</b>	Granular mixture, gray in color
<b>ODOR:</b>	Odorless
<b>PHYSICAL STATE:</b>	Solid
<b>pH AS SUPPLIED:</b>	Not Applicable
<b>BOILING POINT:</b>	Not Applicable
<b>MELTING POINT:</b>	> 1220°F / 660°C
<b>FREEZING POINT:</b>	Not Applicable
<b>VAPOR PRESSURE (mmHg):</b>	Not Applicable
<b>VAPOR DENSITY (AIR = 1):</b>	Not Applicable
<b>SPECIFIC GRAVITY (H<sub>2</sub>O = 1):</b>	> 1 g/mL @ 20°C
<b>EVAPORATION RATE:</b>	Not Applicable
<b>SOLUBILITY IN WATER:</b>	Insoluble
<b>WEIGHT PERCENT SOLIDS:</b>	100% Solids
<b>PERCENT VOLATILE:</b>	Not Available
<b>MOLECULAR WEIGHT:</b>	Not Available
<b>VISCOSITY:</b>	Not Applicable
<b>FLAMMABLE LIMITS:</b>	Not applicable.
<b>FLASH POINT:</b>	Not applicable.
<b>AUTOIGNITION TEMPERATURE:</b>	> 1830°F / 999°C

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**SECTION 10: STABILITY AND REACTIVITY**


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**STABILITY:** ☒ **STABLE**
☐ **UNSTABLE**
**CONDITIONS TO AVOID (STABILITY):** Does not spontaneously ignite.

**INCOMPATIBILITY (MATERIAL TO AVOID):** Reacts with water, acids, and caustic solutions.

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

**HAZARDOUS POLYMERIZATION:** Does not occur.

**CONDITIONS TO AVOID (POLYMERIZATION):** Not applicable.

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**SECTION 11: TOXICOLOGICAL INFORMATION**


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**ACUTE SYMPTOMS / SIGNS OF EXPOSURE:**
**EYE CONTACT:**

Dust or particulates may cause irritation including pain, tearing, and redness. Scratching of the cornea can occur if eye is rubbed. Fumes created when the thermite powder is ignited may be irritating.

**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 the molten metal will cause severe 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.

**CHRONIC EFFECTS:** None expected.

**SENSITIZATION:** None expected.

<b>TOXICITY TO ANIMALS:</b>	Thermite powder:	LD 50 [oral, rat]:	Not applicable
		LC 50 [rat]:	Not applicable
		LD 50 [dermal, rabbit]:	Not applicable

The thermite powder or its ingredients are not listed in the National Toxicology Program Report on Carcinogens or as a potential carcinogen by OSHA, and have not been identified to be a potential carcinogen in the International Agency for Research on Cancer Monographs.

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**SECTION 12: ECOLOGICAL INFORMATION**

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

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**SECTION 13: DISPOSAL CONSIDERATIONS**

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**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:**

Ingredients or the product are not Listed Hazardous Wastes. The product may meet the definition of a Reactive Hazardous Waste (40 CFR 261.23)

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**SECTION 14: TRANSPORT INFORMATION**

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**U.S. DEPARTMENT OF TRANSPORTATION**

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

**WATER TRANSPORTATION**

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

**AIR TRANSPORTATION**

<b>PROPER SHIPPING NAME:</b>	THERMIT
<b>HAZARD CLASS:</b>	NOT APPLICABLE
<b>ID NUMBER:</b>	50390
<b>PACKING GROUP:</b>	NOT APPLICABLE
<b>LABEL STATEMENTS:</b>	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.

### STATE REGULATIONS:

**New Jersey Right to Know Hazardous Substance List:**

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

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

## SECTION 16: OTHER INFORMATION

### 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

## **SAFETY DATA SHEET**

Starter Mixture of Safe Start Crucible

**PREPARATION INFORMATION:** Last revised August 17, 2017. Reviewed 1/12/2021

**DISCLAIMER:**

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