



## **ALUMINOTHERMIC DEMONSTRATION BOX**

**INSTRUCTION SHEET**

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## 1. Safety instructions

The demonstration box and the parts that it contains must only be used in accordance with the designated instructions. Inappropriate or negligent use can result in severe burns. Only perform the experiment with original equipment and in compliance with the work instructions.

Do not use Thermit<sup>®</sup> portions if the bag is damaged or has already been opened. Do not use Thermit<sup>®</sup> portions that are or have been wet, even if they have been dried afterwards.

All parts used when operating must be thoroughly dry. Make sure that the crucibles do not have any cracks or other damage!

The Thermit<sup>®</sup> reaction generates intense exothermal heat.

The apparatus needed for demonstration must be set up on a fire-proof base or on a tiled table. Do not place the apparatus on any flammable materials. Ensure that the apparatus is on a secure supporting base. During demonstration, ensure that there are no flammable materials in the vicinity of the apparatus (a safe distance of about 100 cm is recommended).

During the demonstration, the reaction products and all the containers that are used will heat up considerably (up to 2,500 °C). Take into account that smoke will be produced during the demonstration, and that there may be sparks. If the crucibles or the Thermit<sup>®</sup> portion still contain traces of moisture, there may be an undesirably fierce reaction. Perform the demonstration in such a way that injuries, damage to property and fires are prevented.

For these reasons, depending on the suitability of the rooms available, it can be a good idea to perform the experiment outside with an appropriate safety distance.

Reaction products in the form of molten or hot metal and slag should be covered with dry sand only, and **not under any circumstances with water or any other extinguishing products!**

## 2. Components



(1) Collection tray	(2) Ignitor
(3) Slag bolt	(4) Closing plate
(5) Cover plate	(6) Reaction crucible
(7) Crucible holder	(8) Collection crucible
(9) Thermit <sup>®</sup> portion	(10) Sand

### 3. Work instructions

#### 3.1 Preparations

1. Dry the reaction crucible and the collection crucible with a burner or in a drying cabinet in order to remove any retained moisture.
2. Sprinkle dry sand into the collection tray and spread it out evenly.
3. Place the crucible holder with its dry reaction crucible onto the collection tray.
4. Cover the outlet opening of the crucible with the dry closing plate.
5. Insert a Thermit<sup>®</sup> portion.
6. Place the cover on the reaction crucible.
7. Position the dry collection crucible centrally under the reaction crucible.



(1) Cover plate	(2) Reaction crucible
(3) Crucible holder	(4) Collection crucible
(5) Collection tray	(6) Sand

#### 3.2 Thermit<sup>®</sup> reaction



Light an ignitor stick with a burner and quickly push it through the hole in the cover into the Thermit<sup>®</sup> portion.

The reaction may start spontaneously, and sparks may be emitted from the hole in the cover.

The aluminothermic reaction spreads quickly throughout the entire Thermit<sup>®</sup> portion after this initial firing. The closing plate is automatically melted; the Thermit<sup>®</sup> steel and the slag flow into the collection crucible.

The reaction products have a temperature of about 2,500 °C.

### 3.3 Recovering the ingot

1. Allow the collection crucible with the ingot to cool (if possible to room temperature). **Do not cool with water!**



2. Turn the collection crucible upside down. If the ingot does not fall out, gently tap the base of the crucible with a hammer. Make sure that the crucible is not damaged.
3. If necessary the ingot can be cooled with water.



### 3.4 Final tasks

1. Allow all parts to fully cool. **Do not cool with water!**
2. Pour back the sand.
3. Clean the reaction crucible by removing the slag from it. Do this by using the hammer to gently tap the slag protruding from the crucible hole. Any remaining slag can be removed the slag bolt provided. When doing this, make sure that the reaction crucible is not damaged.



4. The styrofoam box is designed for the storage of all parts. All parts must be **dry** and **cold** when placed in the box.