

DEFEAT

Development of an innovative insulation fire resistant façade from the Construction and Demolition Waste

Production & Challenges of the Composite Material

Upscaling Process Steps:

- (1) **Separation** of Ceramic and Brick from demolition waste, using conventional method.
- (2) **Grinding** tiles and bricks separately through a Ball Mill or Los Angeles Abrasion.
- (3) **Storing** the grinded waste material into air tight bags.
- (4) **Preparation & Casting of:**
 - Compact geopolymer which can either be brick or tile based.
 - Foam Geopolymer which is tile based.
- (6) **Curing** for 24 Hours at 70 Degrees Celsius.
- (7) **Demolding** of the composite.

Ceramic / Brick Waste Separation



Frederick University, School of Engineering Laboratories, "An Innovative Robotic Separation Method of the Construction and Demolition Waste (CDW)" 17 February 2023

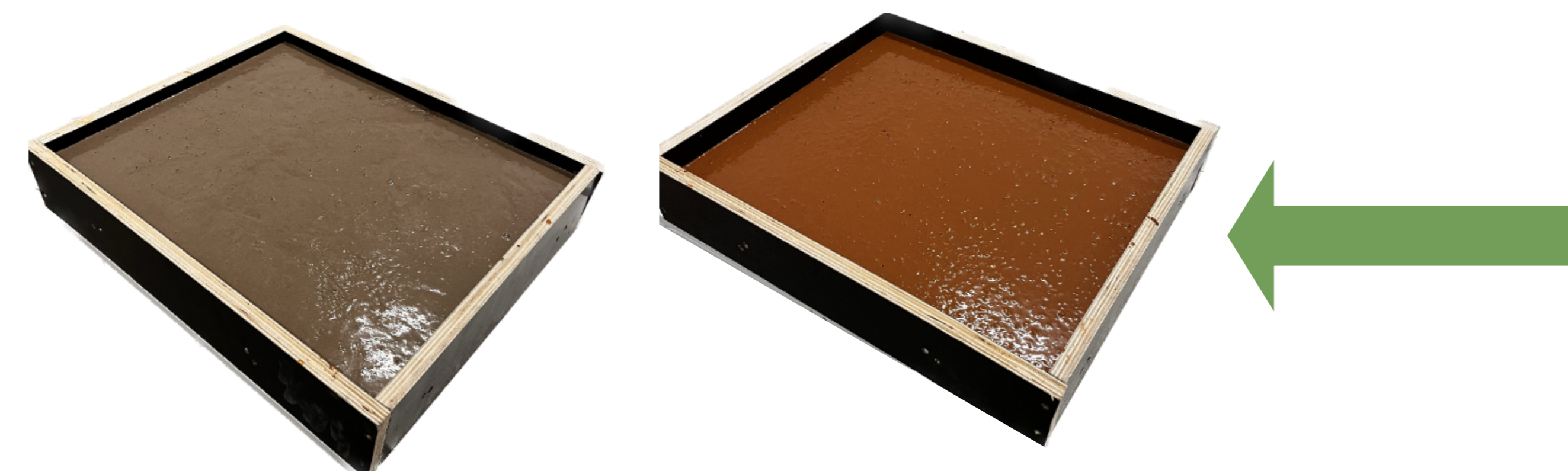
Crashing / Milling



Storing



Mixing, Casting & Curing



Challenges:

- **Optimizing** the grinding process and composite design to lower energy costs and to achieve similar mechanical characteristics and properties.
- **Preventing** the cracking of the foamed geopolymer and compact geopolymer.
- **Preventing** bending of the composite material.



Density of Composite Material $\approx 1100 \text{ Kg/m}^3$

Density of Foamed Geopolymer $\approx 500 \text{ Kg/m}^3$

For the purpose of WP7 - D7.6
Demonstration date:
29/03/2023

Host Organization



Partners



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