



Design fact sheet – Prototype 3



Description

Prototype 3 is an insulating material made of wheat straw. In order to obtain the lower environmental impact of this material, the chosen design is a straw bale, requiring very little transformation and energy.

Use

Wall application, insulation only (self-bearing, non-load-bearing), associated with a timber structure for example.

Dimensions

600 x 600 x 100 mm

Targeted mechanical properties

- No minimal requirement as the prototype is non load-bearing
- According to EN 826: compressive resistance corresponding to a strain of 10% (high deformation)
- Mechanical performances will be improved with a coating

Targeted thermal performance

- Thermal conductivity: the objective is to reach the value of FASBA^a, close to 0.04 W.m⁻¹.K⁻¹, to be competitive with other insulation materials.
- This value can be obtained by changing the orientation of the straw in comparison to its initial orientation (from the baler).

Targeted carbon footprint

A reduction of carbon emissions by 25% in comparison to mineral and glass wool products is targeted.

Targeted performance to fire resistance

In accordance to UK Building Regulations: 30 minutes (it has been measured 90 minutes in the literature^b); the fire resistance will be highly influenced by the coating.

Manufacturing first prototypes

April - June 2018

Tests on prototypes

June - October 2018

Manufacturing optimised prototypes

October - November 2018

^a Fachverband Strohballenbau (FASBA), (2009). Thermal Performance: Strawbale Building, Research Development.

^b Desborough and Samant (2009). Is Straw a Viable Building Material for Housing in the United Kingdom?