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 optimised prototypes
October - November 2018

Tests on prototypes
June - October 2018

Manufacturing first prototypes
April - June 2018


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

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