Eco-friendly construction materials

Production of eco-friendly clay-based construction materials.

Description of the case study:

Claytec [1]’s approach is to produce and utilize clay-based ecological alternatives as raw materials for sustainable construction. Claytec has about 30 years of experience in this field. Lately, the enterprise has evolved from a craft business in monument conservation to a manufacturing business. Claytec employs about 35 people.

The innovation process is based on the structural characteristics of clay and its implementation in different construction materials and construction systems. In parallel, automated production techniques were developed to guarantee an appropriate quality assurance. In this way, the combination of the oldest building material in the world and modern instruments facilitates ecological building.

The characteristics of clay have positive effects from an environmental and health perspective: clay is a natural binder, and it obtains its firmness simply from air drying, no chemical binding is necessary. The mineral structure stays open during usage for masonry or sealing, and there is consequently an air conditioning effect due to a high moisture storage capacity. Through this function, clay can replace energy-intensive air conditioning systems, for example in dry areas.

In regards to production, the manufacturing of clay plaster uses very little energy in comparison to lime cement plaster and gypsum plaster. Lime cement plaster and gypsum plaster require 1,400 – 2,000 MJ per tonne, in comparison to 60MJ per tonne for earth-moist clay plaster. The material is 100% reversible after use, and it can be reactivated.

Claytec cooperates with other manufacturers and research institutions to produce and bring on the market functional building materials through the combination with other ecological building materials (for example eco-see.eu project). Functional means, for example, that the building elements contribute to a healthy indoor climate.
What was the type of green solution? Please select the type of solution: Technology/Product [2]
What does the featured solution contribute to?: Resource efficiency
Protection of public health
Which technology area(s) does the case study belong to?: Materials [3], Bio-based materials [4], Building materials [5], Resource efficiency [6], Raw material efficiency [7], Water efficiency [8], Buildings [9], Building design [10], Insulation [11]
How was the green solution financed?: Private funds [12] Third Party Financing [13]
Emission reductions description: Lower emissions than other building materials
Energy consumption description: Lower Primary Energy Input, in particular in comparison to other materials (5-25% of the energy required by materials for comparable products)
Water consumption savings description: No water use for production
Technical and capacity requirements?:

Technical prerequisites are:
- Mineral resources (a 100km perimeter around Claytec’s location)
- Mechanical processing plan for the raw material: machines, computer assistance (a new machine was developed by Claytec)
- Automated quality control following product standards and ecological standards (such as Nature+ and DIN 18945-18947 criteria).

Capacity requirements are in-house expertise, a high familiarity with the material, a high affinity with the building industry and building trade and fundamental ecological conviction.

Regulatory framework prerequisites and constraints?:

Constraints and risks are not really regulatory, but rather the low awareness level and the trust in the performance of the building material that must be increased. This requires references and time.
- The competing conventional building materials have access to much bigger funds.
- The economies of scale are still missing to get low production costs, due to the small production quantities (niche market).

Partners:
Company name
- Claytec [14]

Source URL: http://greeneconet.eu/eco-friendly-construction-materials

Links