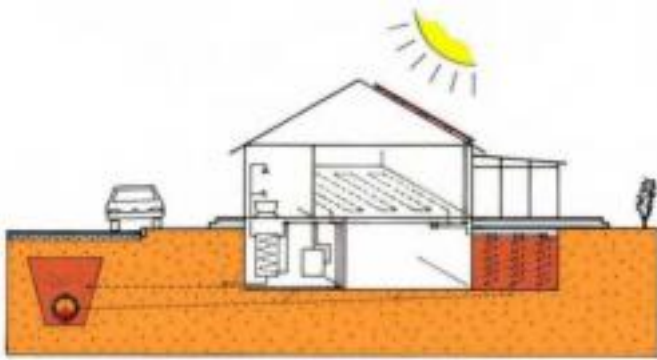


NEW BUILDING MATERIAL – for Green Building Solutions

Date: 02-04-2008 07:23 PM CET

Category: [Energy & Environment](#)

Press release from: [TEC MANAGEMENT](#)



A water absorbent kind of mineral-fixed building material for decentralised underground installation of long-term thermal storage units right beneath or nearby-located to residential or commercial houses or buildings, –strong enough to be build over, environmentally friendly, maintenance-free, storage efficient and cost effective, long lasting, and corrosion resistant. The future key-technology for modern district and unitary low energy heating & cooling systems utilised preferred by green energy sources .

Background:

Buildings of tomorrow will require a combination of minimised onsite energy generation incorporating maximised renewable heat energy sources; ultra-efficient building and insulation materials and equipment; and waste heat recovery.

Solar energy is one of those most potential renewable energy sources. Today, solar-thermal collectors are working quite well, but in order to make them more efficient, it is necessary to run them in combination with a big enough heat storage system to maintain a sustainable and steady heating and cooling supply all year round, that means during nights and periods of cloudy, sunless days too, and in the wintertime (seasonal use).

Other sources like the shallow ground heat, the waste heat from untreated wastewater collection systems and from cooling and air-conditioning, and the energy from biomass boilers, and micro-cogeneration and heat pumps are further potential alternative heat sources, which also can and should be buffered in a heat storage system. So heat storage is an essential part of a very broad range of renewable energy and waste heat recovery options, and is an enabling technology, without it, alternative heating would not be possible quite sufficient. Although heat storage itself is rather invisible, its impact on the amount of renewable energy generated in your house, your city, and your country is huge.

Ultra-efficient building and insulation materials are necessary too to reduce the general heat energy supply and to make smaller heat storage capacities possible. And this opens the opportunity that every new developed real estate or new-built building or house can have its own separate seasonal storage system - if it is easy and cost efficient to install. Narrow city right-of-ways and private land space is limited and very expensive, so an underground solution is advised generally, which uses no open land or interior room space and can be build over. And those underground systems require less insulation, because they are covered by the particular building and embedded in the ground heat.

So every alternative or renewable use of heat should be collected in an appropriate seasonal heat storage system before and be used together with a modern house building concept to run it efficiently. And very important is the need to make the distance of energy transportation as short as possible. So appropriate heat storage systems will become a key technology function in every future heating & cooling system.

New Building Material:

Following the above basic demands Orange Depot Systems has developed a new building material, which is a modified kind of mineral-fixed building material cured in a block in any requested shape and volume with a very special porous structure. This structure has the ability to get saturated with water completely up to 80 % of its volume so far depending on the recipe and the individual requested compression strength, and hold the water by its own capillary structure. And this material can be build over after curing without the need of a heavy-duty and expensive basin, tank or reservoir construction. The building material consists of conventional building components like cement, lime, sand, soil, additives etc., so it can be simply and conventionally manufactured, shipped, processed, and installed by low cost. This material saturated with water is not only able to store heat up to approx. 90 °C but also cold temperatures around the 0 °C level, because it is frost resistant under certain conditions. It can be delivered as a precast product in one block or as smaller modules as like a battery system including all the necessary heat transfer piping and equipment, or as a ready-mixed building material processed and cured only at the construction site. These storage units can be flexible placed or filled up right under the foundation slab or in the basement of the building, or beneath a patio or winter garden (see in the picture on the left side) on individual request and house building design. The material properties are adjustable depending to nearly every individual purpose, and even it can be used additionally as a backfill material. As a backfill material it has the advantage to have the ability to embed city pipeline infrastructures like sewer lines with its additional heat source potential. From the economic point of view its rather advisable to do this during sewer lines are newly laid or replaced or roads basically reconstructed. By this way the complete soil body under city streets can be developed for a long-term thermal storage network systems (see in the picture on the left side) – a huge future perspective.

Further options for construction, design, and operation are unlimited. If you like to know more about other options, a more comprehensive technical brief description is available. Please contact the address below.

Realisation & Use:

The basic idea is patented in Germany and patent-pending worldwide.

The technology is still in the prototype phase and needs final definition of the different recipes and tailored product designs depending on local demands. Orange Depot Systems want to do this and the following worldwide marketing and sale by co-operation with an appropriate potential licence partner. If this is interesting for you, please contact the address below. In the meantime the exclusive license for Germany is hold by a German company.

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TEC MANAGEMENT is an engineering and consulting firm in the field of environmental friendly technologies with focus on underground infrastructures, and beside others specialised on alternative energy storage & supply.

Orange Depot Systems is the label, under which particular systems, products, and techniques are promoted.

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