

عنوان مقاله:

Innovation in thermal insulation materials, a step toward sustainable buildings

محل انتشار:

سومین کنگره بین المللی عمران ، معماری و توسعه شهری (سال: 1394)

تعداد صفحات اصل مقاله: 11

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خلاصه مقاله:

The continual increase in energy needs that results from developing technology, depletion of natural sources needed for life, and environmental pollution all give cause to environmental issues on local and global scales. Sustainable design principles which emerge as a consequence of attempts to minimize negative effects aim for health and comfort conditions which are required both for human life and the protection of ecological balance. In this sense, so that the abovementioned conditions may be fulfilled, the use of ecological materials in the construction of sustainable buildings is of capital importance. When insulation materials, of indisputable importance in terms of energy conservation, are considered in ecological terms, it may be underscored that no insulation material has all the necessary features. With technological developments and the application of ecological and green principles, insulation materials have gained different features. These materials, prominent in the process of energy-efficient building design, continue to develop not only in heat, fire, and sound insulation but also, in the scope of sustainable structural design, in causing no harm to human health and the environment, and in addition to the function of heat insulation as a component of passive design featuring solar radiation conductivity providing for heat gain and natural lighting of the design space. In addition to organic insulation materials such as aerogel with low embodied energy and that are sensitive to the environment, innovative materials with high heat resistance and recycled insulation materials such as cellulose are also among the outstanding examples of this period of change. The paper presents also an analytical application demonstrates that it is supposed to be an expensive method initially but is more advantageous, considering the low costs afterwards, mainly, because of reduced energy consumption. It talks about chemical adaptation of Aerogels for optical applications, chemical adaptation of Aerogels to thermal insulation and its various applications in Building Industry.

کلمات کلیدی:

thermal insulation, aerogel, sustainability, architecture, material

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<https://civilica.com/doc/469859>

