THE IMPORTANCE OF THERMAL INSULATION IN THE BUILDING'S ENERGY EFFICIENCY

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Abstract

Energy efficiency is a way of managing and restraining the growth in energy consumption. Something is more energy efficient if it delivers more services for the same energy input, or the same services for less energy input. Energy efficiency in buildings becomes more important every day. A significant percentage of our nation's energy is used to heat, cool and operate our homes and buildings. Energy loss in buildings means extra operating costs, loss of comfort, and reduced productivity. To make buildings more energy efficient and comfortable, heat flow must be controlled. While it is impossible to completely stop the three modes of heat transfer: conduction, convection and radiation. It is possible to slow the rate of energy exchange by increasing the thermal performance of the building envelope: foundations, walls and roof-ceiling assemblies by using insulation materials. Freedom from thermal bridging is especially important in improving the overall energy efficiency of a building envelope. Thermal bridges are weak points in the building envelope that cause unwanted loss of energy usually associated with structural components in the system. Isolating framing from the outdoor environment, especially highly conductive building materials like steel, aluminum and concrete, with continuous exterior insulation systems is critical to performance. Thermal insulation materials are specifically designed to reduce the heat flow by limiting heat conduction, convection, radiation or all three while performing one or more of the following functions: Conserving energy by reducing heat loss or gain, Controlling surface temperatures for personnel protection and comfort, Facilitating vapor flow and water condensation of a process, Increasing operating efficiency of heating/ventilating/cooling process and power systems found in commercial and industrial installations. Improving energy efficiency in buildings is one of the most cost-effective ways across all sectors to reduce energy consumption and hence greenhouse gas emissions. Energy certification increases awareness of energy consumption and enables consumers to compare buildings, thereby providing builders with an incentive to improve energy efficiency in buildings. Energy performance certification provides a means of rating individual buildings whether they be residential, commercial or public on how efficient (or inefficient) they are in relation to the amount of energy needed to provide users with expected degrees of comfort and functionality.

Keywords**:** *energy efficiency, building envelope, thermal bridges, thermal insulation, energy certification*