Plastic insulation – a sustainable solution

Plastics
The Material for the 21st Century

The durable panels achieve optimum levels of energy efficiency and provide constant insulation over their 50 lifespan.
Source: "Polystyrene insulation & climate change", PlasticsEurope

What is the sustainable challenge?

The demand for sustainability

In 1987 the United Nations defined sustainability as meeting "the needs of the present without compromising the ability of future generations to meet their own needs"[1]. Current concerns about climate change means that today there is an ever increasing demand to use products and services which meet the environmental, societal and economic elements of sustainability.

The building and construction sector can play a major role in saving energy in Europe

The building and construction industry has a major role to play in reducing energy use and hence the emission of carbon dioxide resulting from fossil fuel generation of energy. Carbon dioxide emissions are the largest contributor to global warming.

Currently in Europe, the buildings sector is both the largest user of energy (at 40%) and consequently the largest emitter of Co2 (at 36%). This means that this sector can have an enormous impact on energy saving, and, if the 2020 potential is realised, there would be at least 11% less final energy consumption in the EU. Following the Energy Performance of Buildings Directive (May 2010), this process is already under way: as well as including important provisions for improving the energy performance of existing buildings, the Directive mandates that all new buildings will have a "nearly zero energy" demand from 2021, starting with all new public buildings in 2019. Green Building ratings, such as LEED or BREEAM, develop additional criteria for energy efficiency which can only be met with insulation materials.

[1] Brundtland Report, Brundtland Commission, United Nations Commission on Sustainable Development – 1987

Cover: The Ozzano dell'Emilia project (Italy) includes five separate family "passive" houses where plastics in general are used for a variety of applications, insulation included, all of which add to the building's sustainability.
Source of info : PVC Forum Italia, Italy - AIPE, Italian association of EPS producers - Studio Arkit, Italy

XPS is the insulation material which exclusively fulfils all the specific physical characteristics required to efficiently insulate and protect buildings from extreme temperatures and moisture.
Source: www.exiba.org

Plastic insulation: a sustainable solution

Plastics are used for a wide and growing range of building applications, from insulation to piping, and window frames to interior design. The continuing popularity of plastics is due to their durability, strength, resistance to corrosion, low maintenance, cost-effectiveness and aesthetically pleasing finish.

Up to 60% of the energy used in buildings is due to heating and cooling needs. Making our buildings more energy efficient and reducing the amount of energy required is key to minimising the environmental impact. Insulation is recognised as the one of the easiest and most cost-effective ways to achieve this.

Plastic insulation can improve the energy efficiency of buildings and reduce CO_2 emissions and has been shown to be effective on a broad range of sustainability factors. Plastic insulation is a very effective contributor for sustainability in construction.

The value and benefits of plastic insulation to the environment

As plastic insulation materials require only minimal thickness to achieve maximum energy efficiency; they are amongst the most thermally efficient insulation materials available on the market. They are simple to install both in existing and in new buildings, are very durable and perform at the same high level over the whole life of the building. Due to these constant performance characteristics, adopting plastic insulation materials results in significant long-term energy savings.

Since buildings and plastic insulation have a long lifetime, plastic insulation materials can be recycled or recovered depending on the type of plastic. Plastic insulation does not degrade or deteriorate and so can be recovered in several days, for example, by adding it back into new insulation or moulding it into new applications.

At the end of their useful life the stored energy in plastics can be recovered in modern incinerators and then used for local heating and for the generation of electricity.

Plastic insulation provides sustained environmental benefits for relatively little initial environmental cost.

Improving lives and protecting the planet in new ways every days
Source: www.pu-europe.org

Over its lifetime, plastic insulation saves more than 200 times the energy used in its manufacture, and its very high thermal efficiency also adds to savings. Minimal thickness reduces the land used for buildings and the size of the structure – with the added benefit that fixings and stud depth are in turn smaller. This also helps meet EU climate change targets as buildings have better insulation efficiency levels.

Long term durability, including moisture resistance, means less need for replacement. Panels are also lighter and thinner than alternative insulation materials resulting in more product being transported in less deliveries, reducing emissions.

The value and benefits of plastic insulation to the economy

Investments in insulation are recognised as offering the lowest cost mitigation of carbon dioxide emissions and have a rapid pay-back period when compared to most other solutions. The savings from reduced energy bills will normally pay for the investment after only a few years.

The low cost of the product over its lifecycle makes it attractive to both new build and refurbishment developers as well as building dwellers who can save money on their heating bills. As an investment opportunity, plastic insulation gives a higher return on investment than many other financial products. As legislation and environmental concern heightens the awareness of the benefits of insulation in the new build and refurbishment market becomes, the market will develop significantly and thus the industry will grow. This will have a positive effect for local economies which will benefit from increased employment, in both direct and related industries.

The value and benefits of plastic insulation to society

A significant step forward to increase energy security in Europe would be to reduce overall demand for energy. Then renewable micro or macro energy generation would be a more viable and sustainable source of supply to help meet the remaining energy requirements. An increase in insulation to help to achieve this would have the added benefit of creating new local jobs in the sector and also boosting employment in general.

Providing affordable, durable, energy efficient homes helps to reduce poverty whilst offering higher comfort levels in all well insulated buildings.

In terms of health and safety, plastic insulation is safe for consumers. For workers, there is no irritation from released fibres or dust in installation and use, or from chemical binders.

Plastic insulation – meeting sustainable options

In terms of performance, plastic insulation materials should be assessed as much as possible when they are actually installed in a building rather than just as stand-alone materials. For example, in addition to their insulation properties, some plastic insulation products provide mechanical strength. The knock-on effects of insulation materials on a building also need to be taken into account, such as how insulation choices affect the design of the building and the use of other materials such as fixing devices, ancillary materials, the size of window boards, the thickness of rafters and studs, the surface of the roof and so on.

As well as providing effective protection against cold, heat, and noise pollution, plastic insulation saves resources through cost-effective production, ease of installation and long-life. In a typical house, the energy needed to produce plastic insulation is recovered within less than one year of use and energy savings continue for the full lifetime of the building. After use, the plastic insulation can be re-used, recycled or turned into a source of energy.

Plastic insulation in buildings contributes significantly to enabling a sustainable solution to climate change.

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