



Does your house  
respect  
the environment?

The passive house  
with Dow-Building Solutions

## ■ **The Passive House** insulated with Dow-Building Solution products



### ■ **An extraordinary result**

**E=-92% & "0" CO<sub>2</sub>**

As we live in our houses we use energy for heating, cooling, hot water and lighting, but in many existing house a large amount of energy is wasted because of inefficient construction.

**That wasted energy means more emissions of harmful greenhouse gases (such as CO<sub>2</sub>) and polluting particulates (PM10s).**

But it doesn't have to be like that: the energy efficiency of existing houses can be vastly improved by upgrading the insulation in walls and roofs, eliminating thermal bridging, refurbishing doors and windows, and fitting low and zero carbon building services.

And this is not just theory: Padua has recently seen the opening of the first Italian house to be renovated to the **stringent German 'Passiv Haus' standards** for energy saving construction.

**The Italian Passive House now uses 92% less energy, and produces no carbon dioxide emissions.**



**“ Saving energy and reducing emissions are no longer matters of choice, but necessities. ”**

## ■ The passive house renovation project

The application of energy conservation measures to the building has resulted in a **92% reduction in energy use, and zero carbon dioxide emissions.**

The improvement was achieved by addressing:

- »» **Thermal insulation:** 180 mm of STYROFOAM™ IB, blue extruded polystyrene insulation from Dow, was applied to all the external walls.
- »» **Thermal bridges:** STYROFOAM boards were applied to all exposed wall surfaces around penetrations; 25 mm to window and door jambs, 2 x 25 mm to marble windowsills and 80 mm to blind casings.
- »» **The roof:** insulated with 200 mm of ROOFMATE™ blue extruded polystyrene boards, then protected with ROOFMATE VP-N, a vapour permeable, waterproof membrane – both products manufactured by Dow. The ventilated construction was finished with tiles.
- »» **Openings:** existing doors and windows were repaired and refurbished with triple glazing units and double seals.
- »» **Heating and cooling:** low temperature radiator systems were installed in the walls and ceiling and a mechanical ventilation system with heat recovery fitted.
- »» **Energy supply:** provided by solar and photovoltaic panels, with geothermal and biomass systems.



The house, which is the headquarters of the **Italian Solar InfoCenter** (twinned with the Solar InfoCenter of Freiburg in Germany), is intended to be a reference project for designers and building contractors, and an educational venue for both students and members of the public.

The development is part of an alternative energy and energy saving project sponsored by the Venetian Confederation of Artisans, the Artisans' Union and the municipality of Padua.

**“Saving energy and reducing emissions are no longer matters of choice, but necessities”**, said Sergio Benetello, the representative of the Italian Solar Infocenter and director of the Building Contractors' Group of the Venetian Confederation of Artisans.

**“This project is a concrete symbol of our intention to develop a national policy for sustainable energy”**.



## ■ STYROFOAM Solutions

In the demanding conditions of today's building and engineering projects STYROFOAM blue extruded polystyrene boards can deliver the thermal performance and strength you require - for the lifetime of the structure. As a world-class producer of thermal insulation products, Dow can provide all the help, advice and information you need to achieve the solutions you're looking for. Dow has developed STYROFOAM Solutions, for using STYROFOAM to maximum effect in a wide selection of typical application areas.

## ■ About STYROFOAM

STYROFOAM has been manufactured by Dow for more than 60 years. The process of extruding foamed polystyrene results in a material with uniformly small, closed cells, a smooth 'skin' and an unrivalled set of properties which make it the choice of specifiers, contractors and end-users in a wide range of demanding insulation applications:

- »» **low thermal conductivity** - minimising the board thickness needed to achieve a specific U-value, thus allowing the designer greater flexibility.
- »» **high compressive strength** - in load-bearing applications, the closed cell structure gives the foam great rigidity and makes it highly resistant to compression.
- »» **low water absorption** - STYROFOAM has natural resistance to rain, snow, frost and water vapour which makes it an exceptionally stable material, which retains its initial insulation performance and physical integrity in exposed conditions over the very long term. It was this unusual property that made possible the inverted warm roof concept, pioneered by Dow.
- »» **workability** - STYROFOAM is easily worked with normal hand tools.
- »» **hygiene** - STYROFOAM boards have low susceptibility to rot, mould or fungal growth is therefore minimised. They are clean, odourless and free from irritating dust.

STYROFOAM is available in a number of different grades designed to meet the performance requirements of specific applications.

Each construction project has its own unique combination of insulation requirements. Developing an accurate insulation project specification can be a time-consuming process. However, the designer now has available a range of fast-track templates in the form of STYROFOAM Solutions.

Detailed and country-specific information is available on The DOW-BUILDING SOLUTIONS web sites at [www.styrofoameurope.com](http://www.styrofoameurope.com)

## ■ Meeting environmental standards

Concern about ozone depletion in the stratosphere has led to international agreements to phase out the use of ozone-depleting chemicals. All STYROFOAM products are hydrochlorofluorocarbon (HCFC) free and comply with the requirements of EC Regulation No 2037/2000 (1 Oct 2000) on substances which deplete the ozone layer.

**STYROFOAM products meets the requirements of the European regulation 2002/91/CE related to the energy efficiency of buildings.**

## ■ About Dow

Dow is a diversified chemical company that harnesses the power of innovation, science and technology to constantly improve what is essential to human progress. The Company offers a broad range of products and services to customers in more than 175 countries, helping them to provide everything from fresh water, food and pharmaceuticals to paints, packaging and personal care products. Built on a commitment to its principles of sustainability, Dow has annual sales of \$49 billion and employs 43,000 people worldwide. References to "Dow" or the "Company" mean The Dow Chemical Company and its consolidated subsidiaries unless otherwise expressly noted.

**More information about Dow can be found at [www.dow.com](http://www.dow.com)**



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