Neopor®
Innovation in Insulation

Application Prefabricated house

BASF
The Chemical Company

Recentlyten new houses were completed in Hayes, Middlesex, a London suburb, within a matter of weeks using a new type of insulated steel-framesystem from Fusion Building Solutionsof Cork, Ireland. The building project in Kingshill Avenue was the first of its kind in the UK's social housing sector. The houses are not only cheap to build owingto thefast construction, they are also extremely energy efficient thanks to the excellent thermal insulation. The keyto such performance was the insulation material employed: Neopor®, the new expanded polystyrene (EPS) from BASF.

Design

The building's wall elements, which can be as large as 8 m x 3 m, are prefabricated by foaming a 132-mm thick layer of Neopor® onto a steel frame in a special moulding tool. Once at the building site, the wall elements are anchored to a concrete slab foundation and bolted together. The interior wall is finished with plasterboard, while the exterior is clad with brickwork facing elements, held in place by wall ties. Doors and windows can be placed at any position. A weatherproof shell and roof can be put up in less than a week, and in 12 weeks a terraced property with 75 square metres of living space is ready for occupation.

Tough requirements placed on Neopor®'s heat insulation properties

Social housing in particular must not only be affordable but energy efficient too. Since the width of the steel studs limits the thickness of the insulation layer, it was necessary to choose a material with particularly low thermal conductivity. The silver–grey coloured Neopor® is a new generation of insulating foam derived from BASF's world-famous Styropor® EPS. Neopor® foam with a density of 19 - 20 kg/m³ has a thermal conductivity of just 0.031 W/mK – that's 20 percent better than Styropor – and thus provides the necessary heat-blocking characteristics despite the restrictions on its wall thickness.

In today's building regulations, a so-called U-value is used to describe the thermal transmittance of an exposed building element such as a roof, wall, window or door. The U-value of Fusion's Neopor®-based exterior wall elements is just 0.27 W/m²K – one reason why Neopor® is specified explicitly for the manufactureof Fusion's steel-framed elements, which comply with Part L of the UK's new tougher building regulations.

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