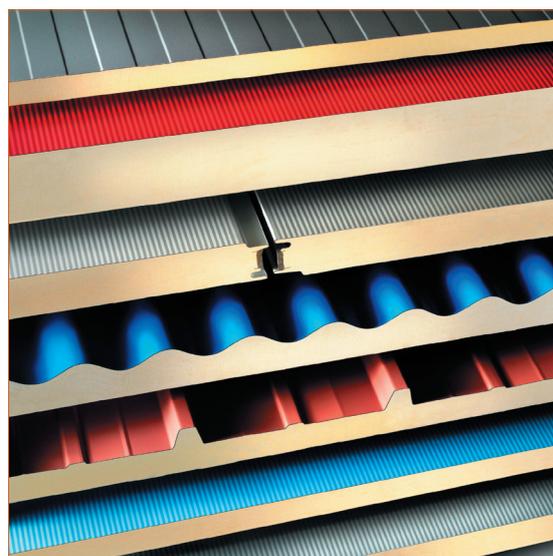


PU Europe FIRE HANDBOOK

SUSTAINABLE CONSTRUCTION WITH RIGID POLYURETHANE INSULATION

Rigid polyurethane (PUR/PIR - PU) insulation is widely used in all kinds of applications, in both residential and non-residential buildings the principal application being its use as a high performance insulation material. PU products take many different forms the majority being PU with a variety of facings from steel to thin foils. Key characteristics of PU include its high versatility, durability and, above all, its outstanding thermal insulation capacity. The term PU is used to denote both PUR (polyurethane) and PIR (rigid polyisocyanurate) building insulation products – a definition of each is given in the product standard (EN13165). PIR was developed to give inherently higher fire performance useful in certain applications, but actual fire performance test data should be obtained where required for each specific product.

The imperative to cut carbon emissions through the provision of energy efficient buildings has led to an increased popularity of PU insulation, which can deliver very high levels of performance without excessive thickness or weight, minimising any impact on the overall building structure. Quantification of overall environmental performance and economic costs of using PU insulation in low energy buildings has proven that material selection for sustainability cannot be disconnected from the building context [1]. Knock-on effects of insulation product choices



and resulting component thicknesses can become significant in terms of environmental and cost efficiency performance.

Next to energy efficiency, it is clearly important to understand the other aspects that need to be considered in the design and specification of sustainable buildings, such as fire safety.

Fire safety regulations remain in the responsibility of Member States. However, fire test standards and classification systems on which the regulations are based have been harmonised

¹ PU Europe factsheet n° 15: *Life Cycle Environmental and Economic analysis of Polyurethane Insulation in Low Energy Buildings* (2010)

WHAT IS PU?

PU insulation stands for a group of insulation products based on PUR (polyurethane) or PIR (polyisocyanurate). Their closed cell structure and high cross-linking density leads to characteristics such as excellent insulation, properties good heat stability and high compressive strength. PU insulation has a very low thermal conductivity, starting from as low as 0.022 W/mK, making it one of the most effective insulants available today for a wide range of applications.

As PU shows very low emission levels and is non hazardous to normal skin contact, it is also widely used in applications outside the construction industry. This includes medical devices, clothes, mattresses, car parts and fridges.

throughout the EU with the introduction of the Construction Products Directive (CPD). The CPD is applicable to the building performance itself or its parts, however, classification can be applicable to the construction product, e.g. for reaction to fire classification. Interpretations are necessary to make the link between the product and building performance. Alternatively, the CPD and country legislations allow the application of fire safety engineering (FSE) principles and system or application related testing to ensure that the most suitable insulation product to achieve optimum overall performance can be specified.

As commonly used and highly effective insulation materials, PU insulation products meet a wide range of requirements of both national fire regulations and insurer backed standards, and have a proven track record in use.

