

## New PIR foam system with enhanced fire behaviour for metal-faced sandwich panels

Sandwich panels comprising two metal facings and a polyisocyanurate (PIR) rigid foam core have long been used for the efficient thermal insulation of large warehouses, cold stores and other industrial and administration buildings. Bayer MaterialScience has now come up with a new, more environmentally compatible PIR foam system with significantly enhanced fire behaviour that has benefits over established systems, especially when it comes to smoke gas development. The new PIR foam system is based on a polyester with an eco-friendly manufacturing process.

Metal-faced sandwich panels based on this new product class achieve a B-s1,d0 classification in the DIN EN 13823 Single Burning Item (SBI) test, with s1 representing the lowest smoke gas development class and d0 indicating that there are no flaming droplets. In recent years, the SBI test has increasingly become a standard requirement in Europe for the fire and smoke behaviour of building components. For example, the new European standard for sandwich panels – DIN EN 14509 – also uses SBI-based tests for fire classification purposes.

PIR metal-faced sandwich panels can be manufactured on continuous laminators. The PIR reaction mix is first laid down on one metal facing. It foams and immediately bonds with the second facing, which is applied from above. In this way the rigid foam core is bonded to the two facings in a shear-resistant manner. The finished sandwich panels are self-supporting, very strong and relatively light. A variety of profiling options and coloured surface finishing of the facings offer a great deal of scope for designers. This is particularly important when the sandwich panels are used for the façades of administration buildings.

Because the insulating effect of PIR foams is much better than that of mineral wool, the wider range of applications benefits building users and the environment alike. For example, a layer of PIR ten centimetres thick has a heat transfer coefficient of around 0.25W/m<sup>2</sup>K, whereas the value for equally thick mineral wool insulation is normally just 0.4W/m<sup>2</sup>K. A rough estimate of what this difference means in terms of energy consumption can be made based on the example of a factory building. Assuming the building has a floor area of 40x20m<sup>2</sup> and is 10m high, the annual amount of heating oil saved could be roughly 3,000l if both the walls and the roof are insulated with PIR metal-faced sandwich panels rather than panels of the same thickness based on mineral wool, says the company. This lower energy consumption also results in an equivalent reduction in carbon dioxide emissions.

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