

Building the Future

Elastopir® and Elastopor®
PU rigid foam systems

 **BASF**

We create chemistry

Active climate protection with PU insulation products.

Building with PU sandwich elements from BASF means building to the highest standards.

The continuously produced insulation elements are highly energy-efficient and help to significantly reduce carbon emissions and achieve ambitious climate targets.



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1 | Elastopir®

The PU rigid foam system based on extra heat-resistant PIR. Effective fire protection properties – unbeatable energy efficiency



Fire protection



Resource efficiency

Tested to EN 13501-2, Elastopir® rigid foam composite panels have successfully achieved both 30- and 60-minute fire resistance (classification REI 30 for 100 mm and REI 60 for 200 mm). In addition, the Elastopir® portfolio includes systems for panels and insulation boards that have satisfied the demanding criteria of FM 4880 Class 1, 4881, 4882 and 4471, as well as other well-known fire tests.

FEATURES

- Effective fire protection
- Exceptional mechanical and thermal properties
- High-performance insulation even with low material thicknesses
- Low lambda value: down to $\lambda_D = 19 \text{ mW/m}\cdot\text{K}$

Technology

Elastopir® is a continuously produced rigid foam system developed on the basis of PIR (polyisocyanate).

Properties

This extra heat-resistant insulation system meets the challenging requirements of fire protection. With its excellent mechanical and thermal properties, Elastopir® provides full-surface, high-performance thermal insulation without thermal bridges.

Advantages

The construction elements are quick and easy to install. Their versatility, the wide range of colors and different facings

allow a high degree of design freedom. Ideal wherever high-performance insulation is required with low material thickness and effective fire protection.

Extra sustainability in the portfolio

Elastopir® Blue is a version with superlative energy efficiency standards ($\text{Lambda } \lambda_D = 19 \text{ mW/m}\cdot\text{K}$). Elastopir® BMB rounds off our sustainable portfolio, making it possible to substitute up to 100 percent fossil resources with renewable raw materials. Likewise, it is currently already possible to include up to 15 percent recycled plastics in the system's A-component.

2 | Elastopor®

The construction element of closed-cell rigid polyurethane foam with a diffusion-tight metal facing



Efficiency



FEATURES

- Excellent mechanical properties
- High insulation capacity even with low material thicknesses
- Outstanding bonding with different facing materials
- Quick and simple installation thanks to prefabricated insulation elements
- Durable and low-emission

Technology

Elastopor® serves as the core material of multi-layer construction elements consisting of closed-cell rigid foam with diffusion-tight metal facings. The metal composite elements are manufactured in continuous (double belt) and discontinuous (press) processes. Outstanding bonding is ensured with different facing materials.

Properties

Sandwich panels and insulation boards made of Elastopor® deliver the optimum combination of excellent mechanical and physical properties and thermal insulation. High insulation performance is achieved even with low material thicknesses.

Advantages

The construction elements can be fitted quickly and easily and are versatile in their use. A high degree of design freedom is ensured by a wide selection of colors and different facings with a variety of laminations and functional layers.

Elastopor® makes highly energy-efficient construction possible. We are thus actively contributing to climate protection and the achievement of key climate targets.

3 | Applications

Industrial buildings,
commercial buildings,
warehouses



Resource-conserving and energy-efficient building materials are the challenge and the benchmark for future construction.

Fire protection with Elastopir®

Sandwich elements with a core of Elastopir® rigid foam are ideal building materials for facades and roof elements in industrial buildings where not only efficient insulation but also fire protection is important.

They provide optimum and full-surface thermal insulation without thermal bridges.

Elastopor® – customized insulation

Sandwich elements with a core of Elastopor® are the customized insulation material for modern industrial design.

Multi-layer construction elements with a core of PU rigid foam and a diffusion-tight metal facing are ideal for the production of facade and roof elements of industrially used buildings.

3 | Applications

Cold stores, cool rooms, cold storage cells

Optimizing the energy balance

In all areas where efficient and dependable cold chains and resource-saving construction really count, the polyurethane materials Elastopir® and Elastopor® reveal their peerless advantages.

Thanks to their extremely low thermal conductivity, the PU systems deliver a noticeable reduction in energy, raw materials and emissions in the

insulation of cold stores and cool rooms. Their potential applications are limitless, with the sandwich elements providing the ideal solution for any requirements. In principle, the energy balance of the entire cold chain from the harvest to the consumer can be decisively improved using Elastopir® and Elastopor®.

With sandwich elements insulated with Elastopir® and Elastopor®, the cold chain remains uninterrupted.



3 | Applications

Insulation boards



Innovative approaches to architecture

New architectural approaches and new climate-friendly solutions will be in demand from now on, and not only in metropolitan areas and cities with high densification.

The polyurethane materials Elastopir® and Elastopor® can be used to produce insulation boards with such flexible facings as aluminum foil, mineral fleece and paper. Permitting a high degree of design freedom, they are used not only on industrial buildings

but also in residential construction for the insulation of pitched and flat roofs, exterior walls, and floors. Thanks to the material's excellent mechanical properties, it is suitable for areas exposed to high pressure and weight loads. It also allows the ambitious greening of roofs, which can go a long way towards improving the climate in buildings and cities.

The energy-related and economic advantages over conventionally insulated or non-insulated roof surfaces are decisive.

3 | Applications

Sectional and roller doors

Good value

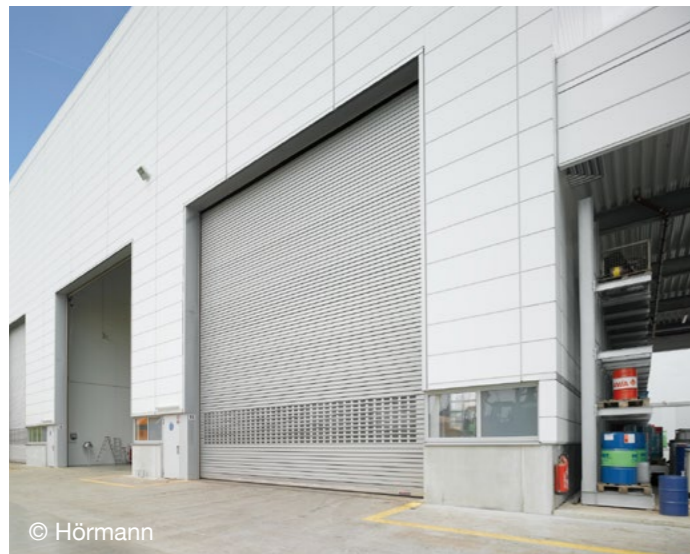
One of the biggest cost drivers in industrial buildings is heat generation. Therefore, in addition to well-insulated walls and roofs, you need to have efficiently insulated gates.

The same applies, of course, to all cold stores and cool rooms, whose doors have to be particularly well in-

sulated. The highly stressed doors must also be robust and durable and protected well against burglary.

Minimizing energy loss with PU

Professional thermal insulation with Elastopor® can curb energy loss significantly. The door becomes a heat buffer for your entire building or production facility.



Installing a thermal frame, which separates the frame from the building structure and provides additional insulation, brings a further improvement of up to 15 percent.

Modern sectional doors opening upwards also have a thermally insulating inner layer of polyurethane, providing greater strength and security. Panels and slats reinforced with Elastopor® contribute to greater security and take

up less space than conventional roller doors.

The hot-dip galvanized, double-walled panels and slats thus achieve results unsurpassed by any other material: strength, acoustic insulation, smoothness of operation, efficient insulation and burglary protection.

4 | Outstanding technology

Simpler, faster and higher quality in production



BASF's patented rake technology makes the production of high-quality PU and PIR sandwich elements easier, more stable and more cost-effective.

The innovative BASF rake replaces conventional laydown devices and, with its modular design, can be adjusted precisely to the panels being produced. Thanks to the rake principle, foam laydown is particularly uniform and complete, enabling stable production conditions to be quickly achieved. The outcome is a uniform, fine-cell foam structure with mechanical properties up to 30 percent better than those of conventional processes. The surface structure is extremely even and free of trapped air. Adhesion to different surfaces allows considerable design freedom.



FEATURES

- Uniform foam application with complete coverage of the lower layer
- Faster achievement of stable processing conditions
- Fine-cell foam structure
- Enhanced mechanical properties
- Sandwich panels without air trapped under the upper facing

Technological and economic advantages

The BASF rake is suitable for all commonly used PU and PIR technologies. Complex retooling is not necessary, thus eliminating additional investment.

The patented rake eliminates costly set-up and failed trials at the start of production.

Process costs are easier to calculate and significantly reduced.

The rake is available as a full package or individually. The portfolio is rounded off by laydown technologies available as alternatives.

5 | Our sustainable portfolio



Renewables

| Elastopir® Blue

FEATURES

- Better lambda value:
 $\lambda D = 19 \text{ mW/m}\cdot\text{K}$
- Better U-value
- Better efficiency
- Superior energy efficiency

BASF has set itself ambitious climate protection goals and is working consistently to be climate neutral by 2050.

One of our biggest activities is to reduce the carbon footprint of our products and create added value with renewable raw materials.

To achieve this aspiration, we are offering new, more sustainable product solutions.

Low product carbon footprint (PCF) – products with low carbon emissions by design

BASF has launched an extensive range of polyurethane products with a low carbon footprint. The footprint of all these products is at least 30 percent lower than that of fossil-based systems.

We thus achieve greater resource efficiency with a significant reduction in greenhouse gas emissions.

Elastopir® Blue is a new rigid polyurethane foam solution that meets the demands of energy efficiency outstandingly with an extremely low lambda value of $\lambda D = 19 \text{ mW/m}\cdot\text{K}$. This sets new standards for PU sandwich panels.

With Elastopir® Blue as the core material, it is possible to produce slimmer panels with significantly improved insulating performance. The polyurethane solution's optimized cell structure yields a core material with superlative mechanical properties and a high surface

quality when modern blowing agents such as cyclopentane and HFOs are used.

The input of blowing agents is adapted perfectly to the customer's specific requirements. Elastopir® Blue is also noted for its excellent fire protection properties.

This is also possible without halogens and yields further benefits for climate-friendly construction.

5 | Elastopir® BMB Elastopor® BMB

Cutting fossil resources by up to 100 percent with BMB.



| PU systems with recycled content

BASF is developing new rigid foam systems that are made partly from plastic waste and help to reduce the product carbon footprint (PCF) of buildings. The new Elastopor® and Elastopir® systems contain a substantial share of recycled material in the polyol component of the rigid PU foam.

The mechanical properties, surface quality and fire behavior are the same. The processing parameters also remain unchanged. Elastopor® and Elastopir® systems with recycled content do not require any changes to the process

settings and can be handled on the same machines as conventional systems.

With a significant content of recycled plastic waste, we make it easier for our customers to achieve their sustainability goals faster.

The recycled materials used come from established recycling processes for PET waste streams.

More information about BMB you can find here



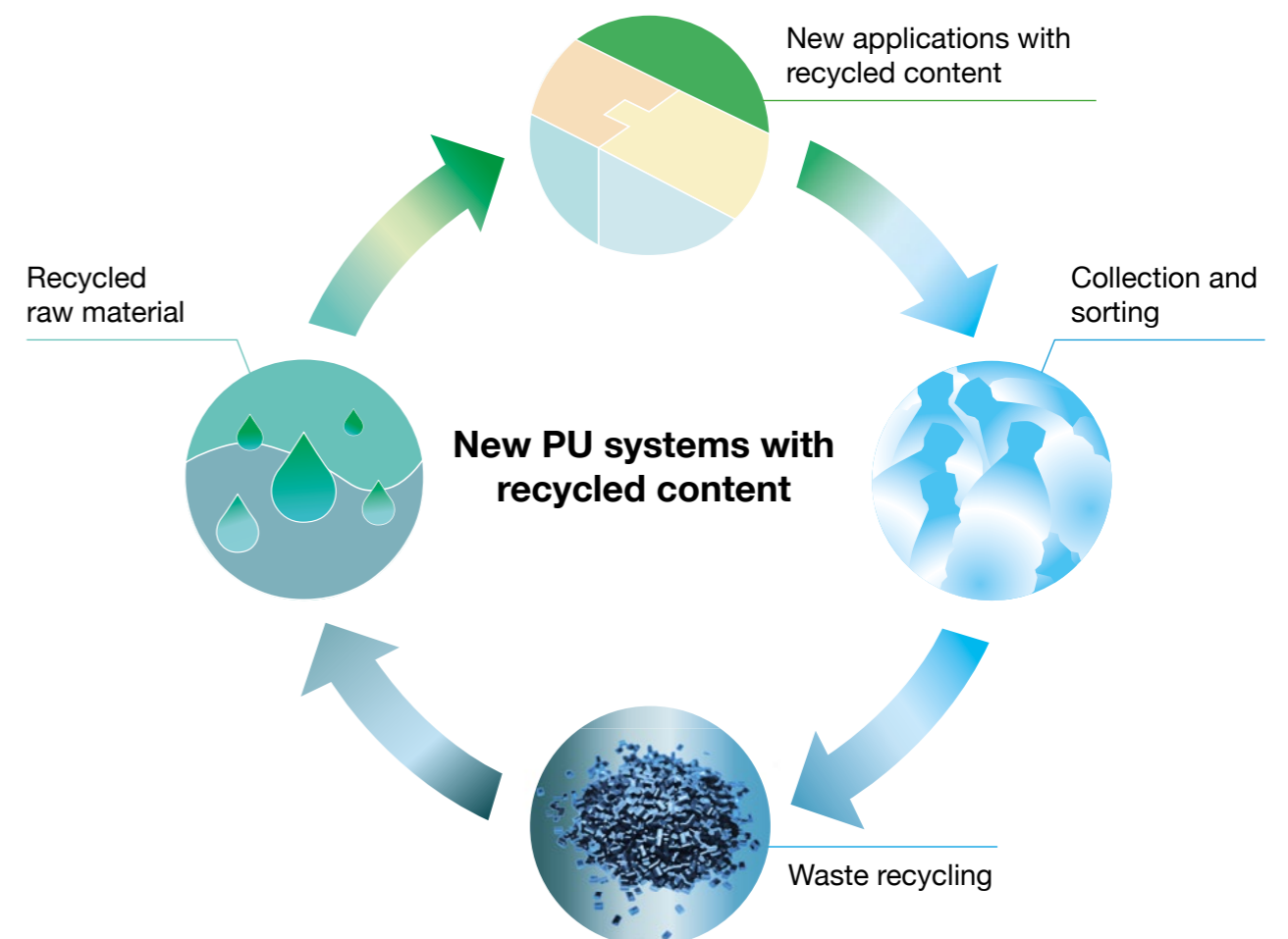
BASF's Biomass Balance approach aims to reduce carbon emissions and conserve fossil raw materials through sustainable product solutions.

In Elastopir® BMB and Elastopor® BMB, fossil resources are replaced by 100 percent renewable raw materials. The BMB-based PU systems have the same performance and properties as conventionally produced panels.

In addition, green electricity and low-emission resources are used wherever possible.

Greater resource efficiency helps our customers to develop more sustainable products and solutions and achieve their sustainability goals faster. More important than ever, this contributes to reducing greenhouse gas emissions over and above the economic benefits.

The sustainable feedstocks of Elastopir® BMB are certified by REDcert². The resources used and production sites are also certified.



6 | Technical data

Overview of Elastopir® and Elastopor® product classes

Elastopir®

Product class	PIR for n-pentane	PIR for c-pentane	Cost optimized PIR	Water based PIR	Elastopir® Blue
Components	5C	5C	5C	4C	5-6C
SBI-smoke	S1/S2	S1/S2	S2	S1/S2	S1/S2
Blowing agent	n-pentane	n-, c-pentane	n-pentane	n-pentane	n-,c- pentane, HFO
Thickness (mm)	40 – 240	40 – 220	40 – 220	40 – 220	40 – 200
Mixing ratio	230	230	230	230	240
Remark	available as BMB	available as BMB	basic PIR system	For export outside EU	Low lambda with c-pentane/HFO

Elastopor®

Product class	PUR-B2	PUR-B3	PUR-B3 2nd gen.	PUR-B3 sec. doors
Components	5C	5C	4C-5C	4C-5C
Fire class	E	F	F	F
Blowing agent	n-pentane	n-pentane	n-pentane	n-pentane
Thickness (mm)	30 – 200	30 – 240	30 – 240	30 – 80
Mixing ratio	140 – 200	170 – 200	160 – 180	160 – 180
Remark			4C max. th. 120mm	

Contact

**BASF Performance Materials
Insulation Solutions**

www.plastics.basf.com



 **BASF**

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