

Safe. Strong.
Styrodur®

BASF
We create chemistry

**Safe. Strong.
Sustainable.**

www.styrodur.com





STYRODUR® –

a success story

With Styrodur, BASF draws on decades of experience throughout the extruded rigid polystyrene foam board market.

We have been producing the insulation material, which is set apart by its high product quality and robustness, since 1964. Styrodur is now the XPS with the most experience behind it.

2006

Approval for green and drivable inverted roofs

2007

As a founding member of the DGNB, BASF demonstrates its support for sustainable building.



2009

First approval for multi-layer use under foundation slabs

1972

Market launch of Styrodur 4000

1978

Approval for inverted roofs



1985

Market launch of Styrodur 3035

1980

Approval for perimeter insulation



1996

Voluntary pledge to switch completely to CO₂ as an environmentally friendly cell gas by 2000

1997

First phase of voluntary switch (80%) completed ahead of schedule

1998

Complete switchover in Germany a year earlier than planned Environmental award for Styrodur C



1999

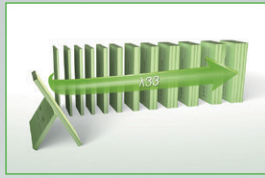
Approval for foundation slabs





2011

Inauguration of the 4th production line in Ludwigshafen, resulting in Europe's largest contiguous XPS production plant



2015

Market launch of Styrodur 3000 CS/SQ
Market launch of Styrodur Welding
Switch to polymeric flame retardant



Approval for doublelayer insulation of inverted roofs



2013

Styrodur is the first insulation to be approved by the German Institute for Building Technology (DIBt) for insulating foundation slabs in seismically active areas



2017

Styrodur Biomass Balance: using the biomass balance method (BMB), the fossil resources required to manufacture Styrodur can be completely replaced with renewable raw materials



2021

Launch of Styrodur Hybrid, the first XPS board with general construction type approval as a perimeter insulation system for concrete pouring in combination with waterproof concrete exterior basement walls.

BASF has been represented on Sentinel Haus with Styrodur BMB since 2021.



**SENTINEL HAUS
INSTITUT**



Sustainability at BASF

Sustainability is integral to BASF's corporate strategy and includes all elements of the value-added chain and Styrodur production.



What is Styrodur®?

Safe. Strong. Styrodur

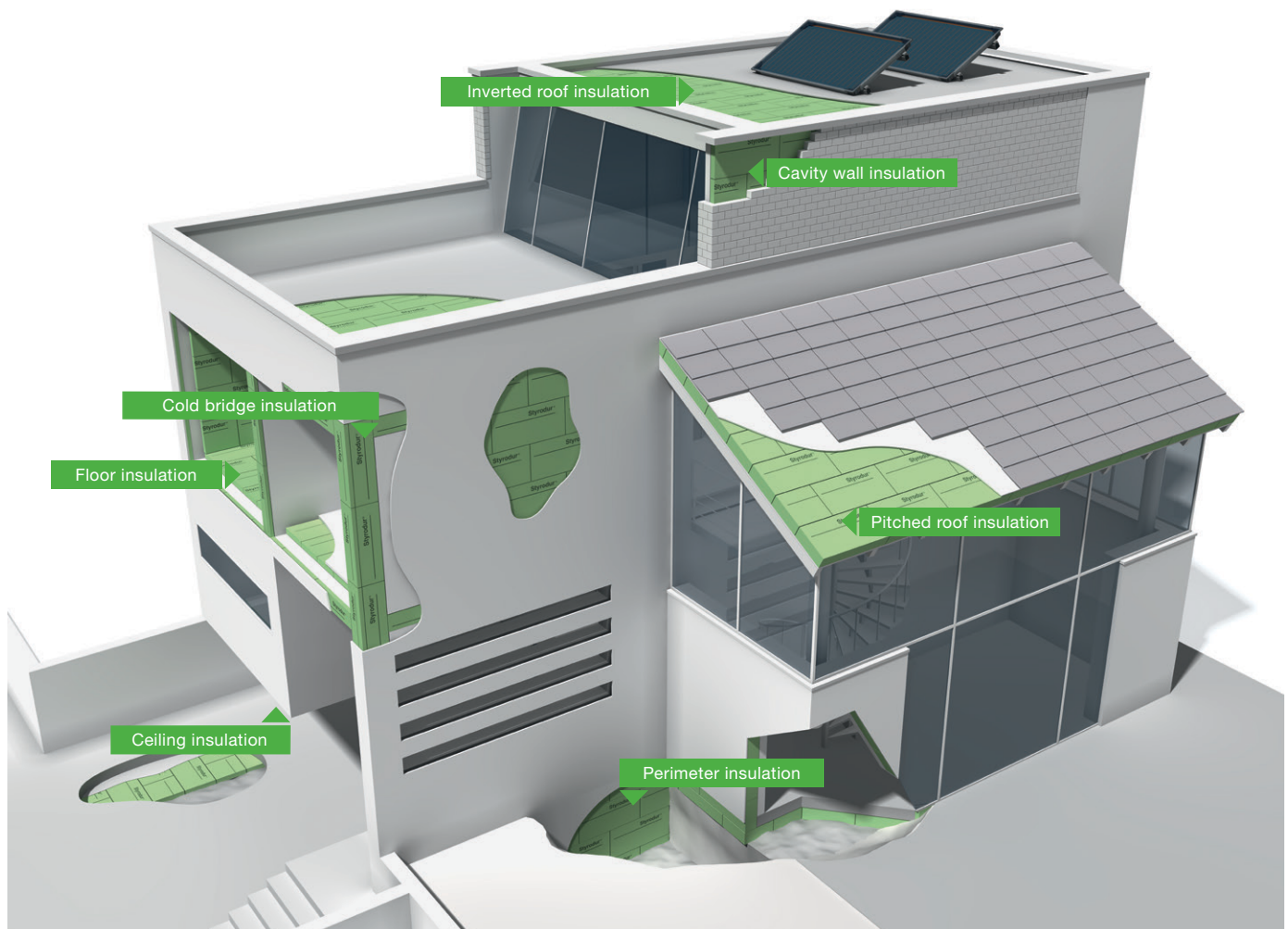
With Styrodur, BASF draws on decades of experience in the XPS market: the company has been producing the green insulation material, which is set apart by its high quality, versatile range of applications, and robustness, since 1964. Styrodur stands for technology “made in Germany” and for unique, constantly evolving work on approvals. This is why Styrodur has convinced generations of architects, craftsmen, builders, and building material suppliers of its benefits:

- Low water absorption
- High compressive strength
- Resistance to decay
- Excellent insulation properties
- Reduced energy costs



Wide variety of applications

Styrodur’s outstanding properties make it the perfect product for insulation work of all kinds – from foundation slabs to roofs. Thanks to its high compressive strength, it is particularly suitable for all load-bearing applications.



Energy efficiency

Optimal thermal insulation with Styrodur makes a major contribution to reducing carbon dioxide (CO₂) emissions—the main cause of the greenhouse effect. Styrodur protects building constructions against cold and heat in equal measure and offers excellent energy efficiency. In various applications, Styrodur prevents the emission of 6-7 tonnes of CO₂ per square metre of insulated surface over a period of 50 years, making a decisive contribution to the eco-efficiency of construction projects.

This eco-efficient insulation prolongs the lifespan of the property and increases its value. Thermal insulation with Styrodur stands for thermal comfort, which is key to creating a healthy living environment. Furthermore, investments in comprehensive thermal insulation measures pay off for building owners even in the short term due to significantly lower energy consumption.

The quality of the entire product range is monitored by the German research institute for thermal insulation, Forschungsinstitut für Wärmeschutz e.V. München (FIW).

The carbon footprint of Styrodur®

To produce one square metre of Styrodur, between 1 and 15 kg of CO₂ are emitted, depending on the board thickness and density. In various applications, Styrodur prevents the emission of 6–7 tonnes of CO₂ per square metre of insulated surface over a period of 50 years. Overall, this represents a positive ecological balance.



Safe and sustainable production

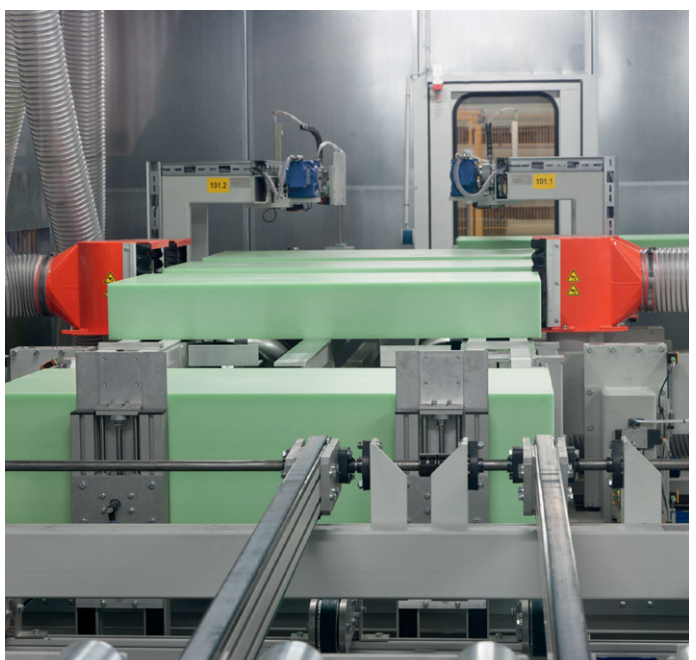
BASF's site in Ludwigshafen, Germany, is home to Europe's largest integrated XPS production facility. Producing Styrodur in a way that is safe and sustainable for people and the environment is of the utmost importance to us. To that end, we are constantly on the lookout for further optimisation potential.

Use of polymeric flame retardant

Since 2014, Styrodur has exclusively been produced using polymeric flame retardant, which has a far superior environmental profile to the previously used HBCD. Our insulation materials continue to meet the stringent flame retardant requirements for building products.

Greener propellant

As the largest chemical corporation in the world, BASF occupies a leading position in the research and development of environmentally friendly insulation solutions. Motivated by this responsibility, BASF was the first company in the market to switch completely to low-pollutant CO₂ technology. In 2000, the Federation of German Industries (BDI) awarded Styrodur its Environmental Prize for this achievement.



Sustainable packaging

Our packaging protects the insulation boards from external forces. Here, too, we have come up with a sustainable solution: following production, bulk packs of Styrodur are packaged in shrink film and stacked on top of each other. These are wrapped in a transparent, sustainable plastic film composed of 30 per cent recycled plastic.

Compared with the production of conventional film, this approach reduces CO₂ emissions by around 30 per cent and saves 210 tonnes of virgin plastic. The recycled portion comes from previously used packaging film and shrink wrap. It took several months of development and a number of different tests before the special properties of this new kind of plastic film could finally be exploited.



CO₂ savings in practice

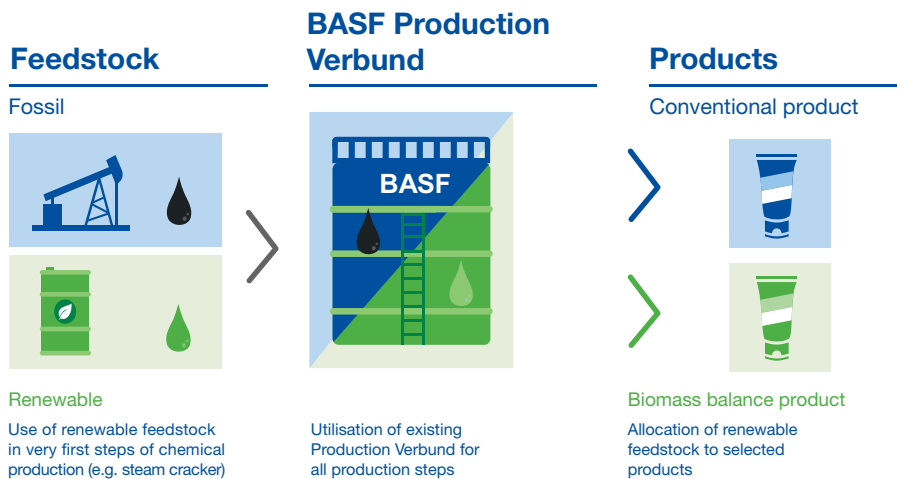
Office building D 105 in Ludwigshafen extends over seven floors with total floor space of 35,000 m² and offers workspace for around 1,300 employees as well as a conference centre with state-of-the-art meeting technology. Styrodur has been used as insulation under the floor slabs and on the basement walls of the new D 105 building. Thanks to its optimal thermal insulation properties, the extruded rigid polystyrene foam (XPS) greatly contributes to reducing CO₂ emissions.



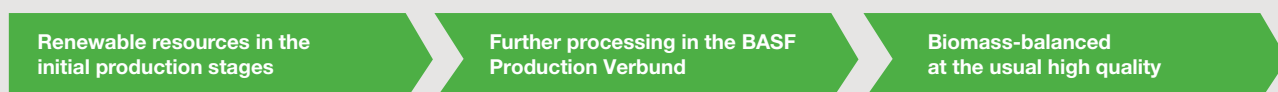
Biomass balance method

BASF has forged a new path with its development of the biomass balance method (BMB) for using renewable raw materials in the chemical industry. This approach allows it to replace fossil resources with renewable feedstock in its Production Verbund.

In the biomass balance method, renewable raw materials such as bio-naphtha and biogas derived from organic waste or vegetable oils are used as a raw material from the very beginning of the process of manufacturing basic chemical products. The proportion of bio-based raw materials is then assigned to specific sales products using a certified calculation method.



BASF has established a closed control chain that extends from the renewable raw materials it uses all the way to the end product. Independent certification confirms that BASF has replaced the required quantities of fossil resources with renewable feedstock for the biomass-balanced product sold. By late 2019, BASF had switched certification of all biomass-balanced products to the new European REDcert² standard for the chemical industry.



Styrodur® BMB

Renewable, rather than fossil, raw materials are also used in the manufacture of Styrodur BMB, thereby saving valuable resources and reducing CO₂ emissions. In contrast to conventional production methods, BASF thus cuts CO₂ emissions by 67 per cent in the case of Styrodur BMB.

- Low water absorption
- High compressive strength
- Resistance to decay
- Excellent insulation properties
- Reduced energy costs



BASFs Biomassenbilanz-Ansatz
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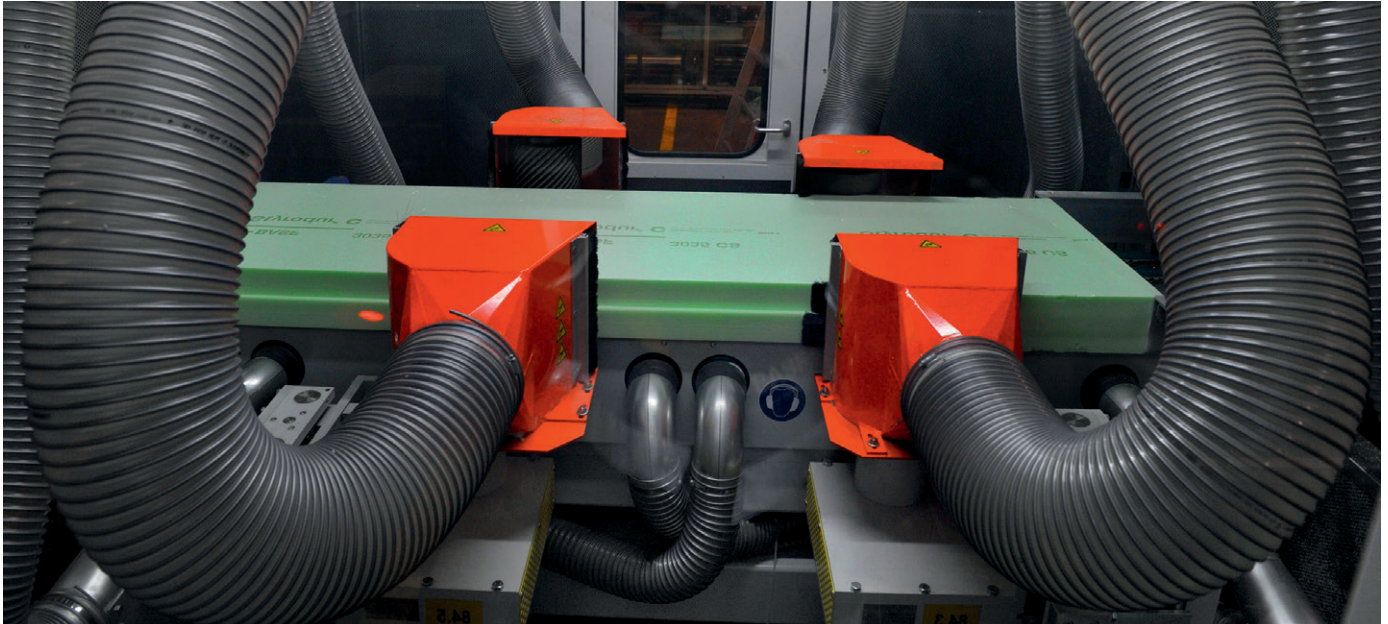
Styrodur BMB: the thermal insulation board that is better for the climate and environment—manufactured in accordance with BASF's biomass balance method (BMB), certified by REDCert².

Biomass-balanced Styrodur BMB was used in the construction of the BASF Creation Center, helping to reduce its carbon footprint. The boards are extremely pressure-resistant, absorb hardly any water, and provide outstanding thermal insulation.



Resource-efficient production

When a building is dismantled, Styrodur can be recycled or used to produce energy, thereby recovering the energy contained in the insulation material. This measure makes sense from an ecological standpoint too. During its service life, Styrodur contributes to saving many times the amount of energy used in its production.



For many years, energy- and resource-efficient production of our Styrodur insulation boards has been one of our top priorities. Milling waste produced during the manufacturing process is recycled and used to produce new Styrodur boards.

Recycled content according to ISO 14021:

- Pre-consumer proportion (%): approx. 20
- Post-consumer proportion (%): Styrodur produced using the previous flame retardant HBCD containing POPs (Persistent Organic Pollutants) cannot be recycled and must be used for energy recovery in accordance with the Basel Convention general guidelines on POPs.
- Styrodur that has been produced (since 2015) using the new polymeric flame retardant can be easily recycled.

Regional distribution:

- Source location of raw material: the main component of the product, polystyrene, is manufactured directly at the production site in Ludwigshafen, Germany.
- Regional product: customers are supplied within a radius of 700 km.

Product safety

Product components/composition:

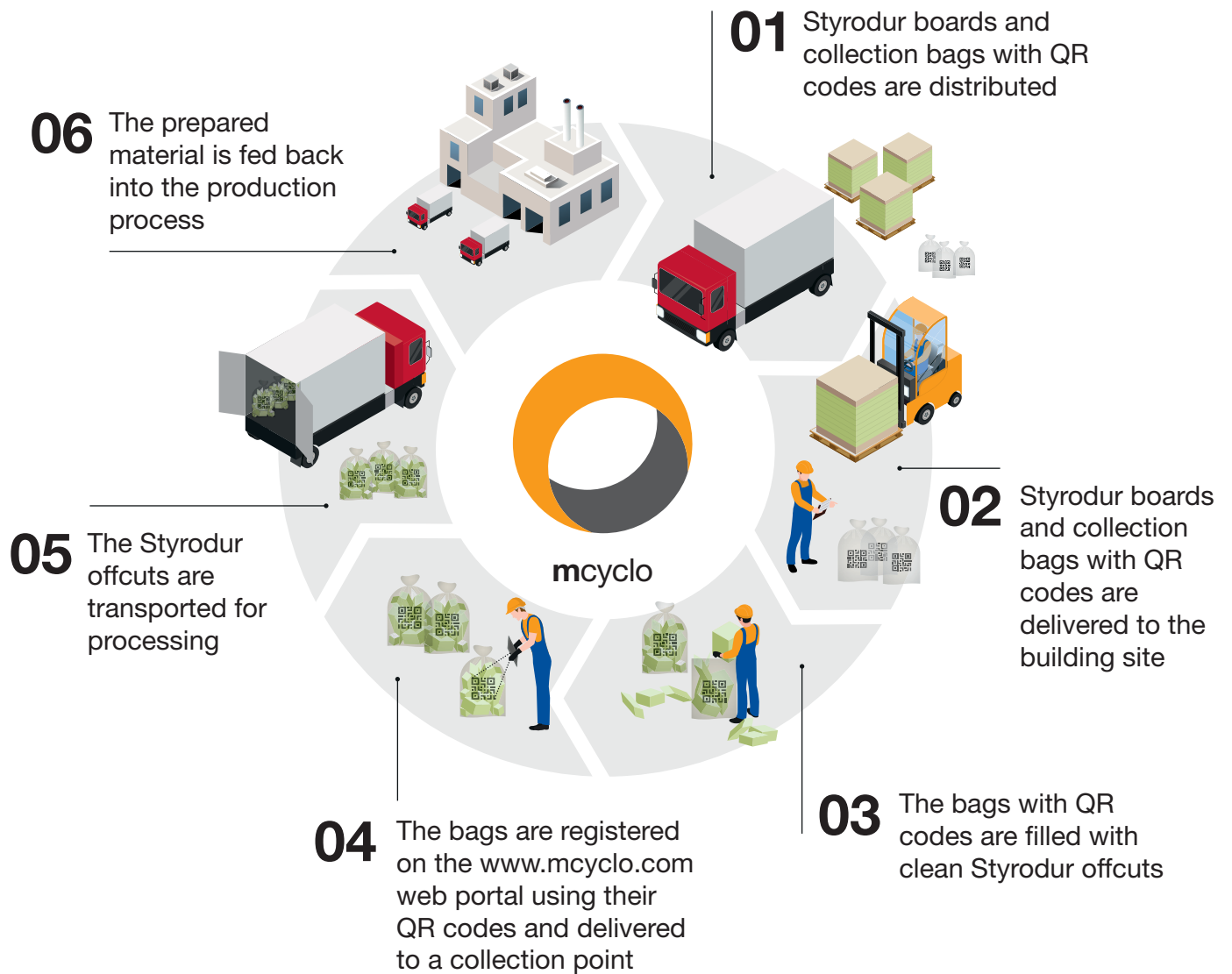
- Approx. 90–95 mass percentage polystyrene (GPPS) (CAS 9003-53-6)
- Approx. 8 mass percentage CO₂ blowing agent (CAS 124-38-9)
- Approx. >4 mass percentage polymeric flame retardant (CAS 1195978-93-8)
- Does not contain any substances of very high concern (SVHC) in compliance with the ECHA

VOC content LEED v4:

- Does not contain any emitting substances, such as coatings, binders, sealants, or adhesives
- Solvent- and softener-free according to the German Paint and Printing Ink Industry Association guideline VdL-RL 01: yes
- Lead/cadmium, chromium(VI): no
- GISCODE: no
- EMICODE: no
- Formaldehyde-free: yes
- VOC in accordance with REACH guideline 2004/42/EC. In Germany, Styrodur fulfils the requirements of the AgBB evaluation scheme (May 2012) and the DIBt requirements (October 2008) for the VOC emissions of building products
- No carcinogenic substances found

Take-back concept for Styrodur® offcuts

Styrodur's outstanding properties make it the perfect product for insulation work of all kinds—from foundation slabs to roofs. For resource-efficient production and to further promote the circular economy in the construction sector, building site offcuts are collected and prepared for subsequent reuse in the production of new insulation material.



Tested and certified

General construction type approvals

The many different applications pose diverse challenges in the search for the ideal insulating solutions. To reliably ensure that planners, architects, and users can plan with confidence, the entire Styrodur product family is backed by unique, constantly evolving approval work. We not only monitor, but also continually improve the quality of Styrodur. Thanks to this far-reaching work to obtain certifications, Styrodur boasts more official approvals for building applications than any other XPS product.



Safety data sheet

According to Regulation (EC) 1272/2008 [CLP]

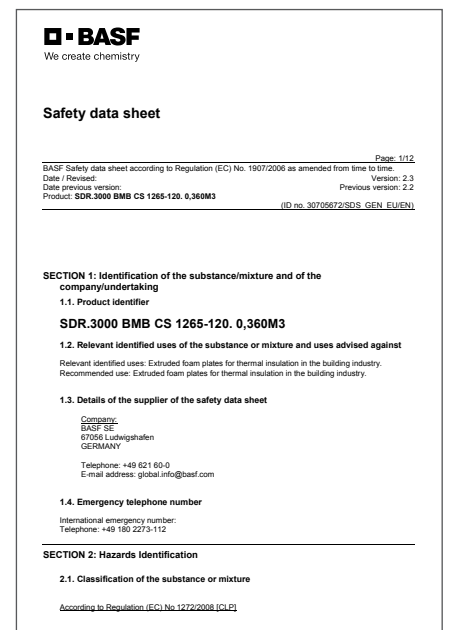
The product is not subject to classification according to GHS criteria.

Globally Harmonized System, EU (GHS)

The product is not subject to labelling according to GHS criteria.

Chemical characterisation

- Contains dyes, polystyrene, and polymeric flame retardant
- CAS No. 1195978-93-8
- Hazardous ingredients (GHS)
- According to Regulation (EC) 1272/2008
- No particular hazards known.



EPD

The EPD (Environmental Product Declaration) describes building materials, building products, or building components in terms of their environmental impact on the basis of life cycle assessments as well as functional and technical properties. This quantitative, objective, and verified information applies to the entire life cycle of the building product and provides an important basis for assessing the sustainability of structures.

REDcert

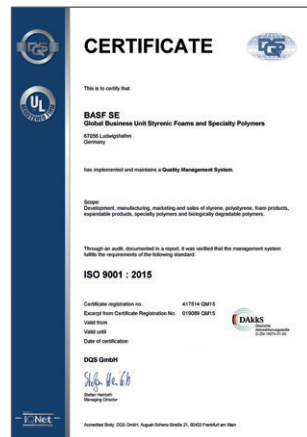
REDcert is a company that operates certification schemes for sustainable biofuels. Since 2018, it has also offered the REDcert² scheme, which covers the use of biomass as a material. That same year, BASF became the first chemical company to achieve certification according to the new REDcert² standard for the chemical industry.



ISO

ISO 9001 is the foremost quality management standard both nationally and internationally.

ISO 14001 has been a globally recognised standard for environmental management systems since 1996. It covers everything relevant to the continuous improvement of environmental performance.



All current documentation can be found on our website www.styrodur.com

German Sustainable Building Council (DGNB)

BASF recognised the trend towards sustainable building at an early stage and was a founding member of the DGNB in 2007. BASF employees are involved in various working groups and in the Materials Committee of the DGNB.



Sentinel Haus

Established in 2007, Sentinel Haus is a German-language database that specialises in healthy and sustainable solutions in the construction sector. Low-pollutant building materials and interior fittings are just some of the products featured. BASF is represented on the database with Styrodur BMB 3000, which has the same technical properties as conventional Styrodur 3000 CS.



Styrodur® – A Strong Product Line

With the Styrodur® product line, BASF offers the ideal insulation solution for almost every application.

Styrodur® 2800 C/Q

The thermal insulation board with an embossed honeycomb pattern on both sides and smooth edges for applications in combination with concrete, plaster, and other top coats.

Styrodur® 3000 CS/SQ

The innovative multipurpose thermal insulation board with smooth surfaces and shiplap for almost all applications in structural and civil engineering and with uniform thermal conductivity across all board thicknesses.

Styrodur® 4000/5000 CS/SQ

The extremely compression-proof thermal insulation board with smooth surfaces and shiplap for applications that require maximum compressive strength.

Styrodur® 3000 BMB

The multipurpose thermal insulation board produced using renewable instead of fossil raw materials with the same technical properties as conventional Styrodur CS/SQ, which helps to save resources and reduce CO₂ emissions.

Styrodur® Hybrid

The thermal insulation board with longitudinal grooves on one side and a shiplap for use as perimeter insulation for concrete pouring with waterproof concrete exterior basement walls.

Up-to-date technical information is available on our website: www.styrodur.com



Important note

The information submitted in this publication is based on our current knowledge and experience and refers only to our product and its properties at the time of going to print. It does not imply any warranty or any legally binding assurance about the condition of our product. Attention must be paid to the requirements of specific applications, especially the physical and technological aspects of construction and building regulations. All mechanical drawings are basic outlines and have to be adapted to each application.

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