

# Neopor®

The sustainable solution  
for your construction project



 **BASF**  
We create chemistry

 **Neopor®**

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## We create chemistry for a sustainable future

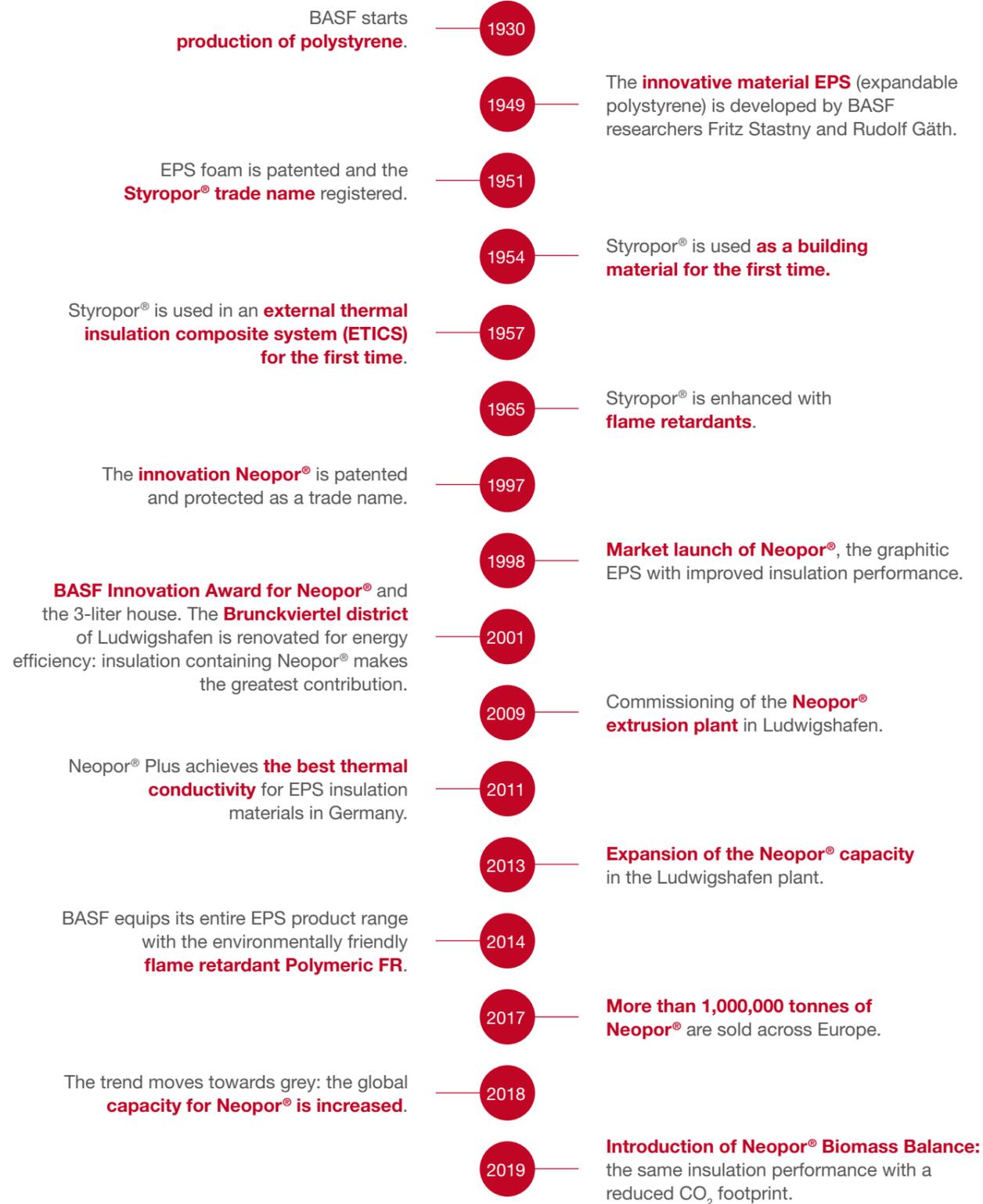
One of the key topics of the BASF corporate strategy is **sustainability** – and this includes all elements of the value-added chain and production:



Further information at:

<https://www.basf.com/global/en/who-we-are/sustainability.html>

## Milestones in the development of EPS: 80 years of continuous innovation



## What exactly is Neopor®?

Neopor® is a black polystyrene granulate that contains blowing agents and is therefore expandable (EPS). By using a polymeric flame retardant (PolymerFR), which as a plastic is very similar to polystyrene, BASF continues to ensure the availability of eco-efficient thermal insulation solutions for sustainable construction.

### Components of Neopor® (proportion in mass %)<sup>1</sup>:

- 87 % polystyrene (GPPS) (CAS 9003-53-6)
- Up to 5.5 % blowing agent pentane
- Approx. 1.1 % PolymerFR (CAS 1195978-93-8)
- < 6 % graphite

<sup>1</sup> Using Neopor® Plus as an example.

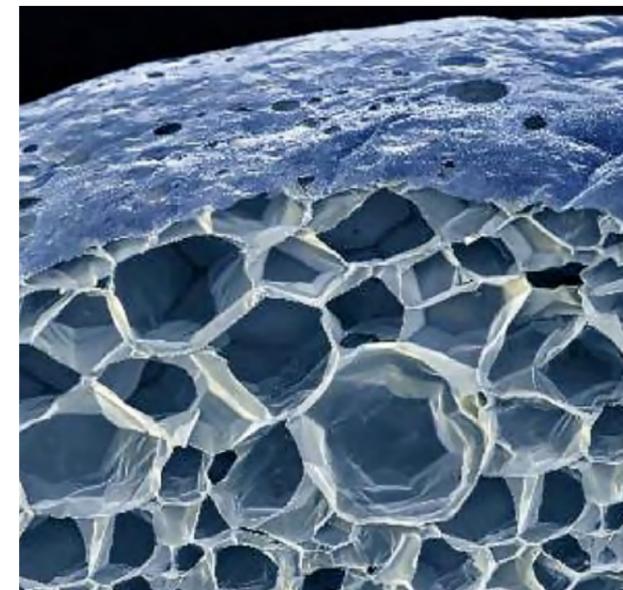
No substances of very high concern (SVHC) in accordance with the Candidate List, Art 59 (1, 10) of the European REACH Regulation (EC) 1907/2006, are used as raw materials in the production of Neopor®.

The product is not subject to classification according to GHS criteria. In accordance with Regulation (EC) 1272/2008 (CLP).

A Cradle to Cradle assessment by EPEA GmbH – Part of Drees & Sommer confirmed that the polymeric flame retardant is neither toxic nor bioaccumulative. The use of PolymerFR enables material recycling of used Neopor®.

### Further information at:

<https://neopor.de/epd-neopor-plus-en>  
<https://echa.europa.eu/en/candidate-list-table>  
<https://epea-hamburg.com/cradle-to-cradle/>



Insulation material producers process the granulate using water vapour to form blocks from which insulation boards are then made. Insulation boards made of Neopor® are **up to 98 per cent air.**

## What contribution does Neopor® make to sustainable building?

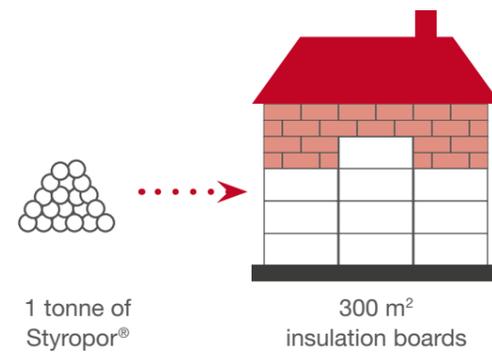
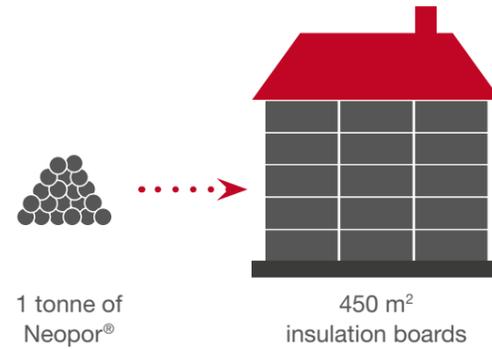
### Neopor® conserves resources:

- Insulation materials made of Neopor® insulate up to 20 per cent better than conventional EPS.
- Less material is used, with better insulation performance, thanks to the use of graphite.
- Outstanding eco-efficiency

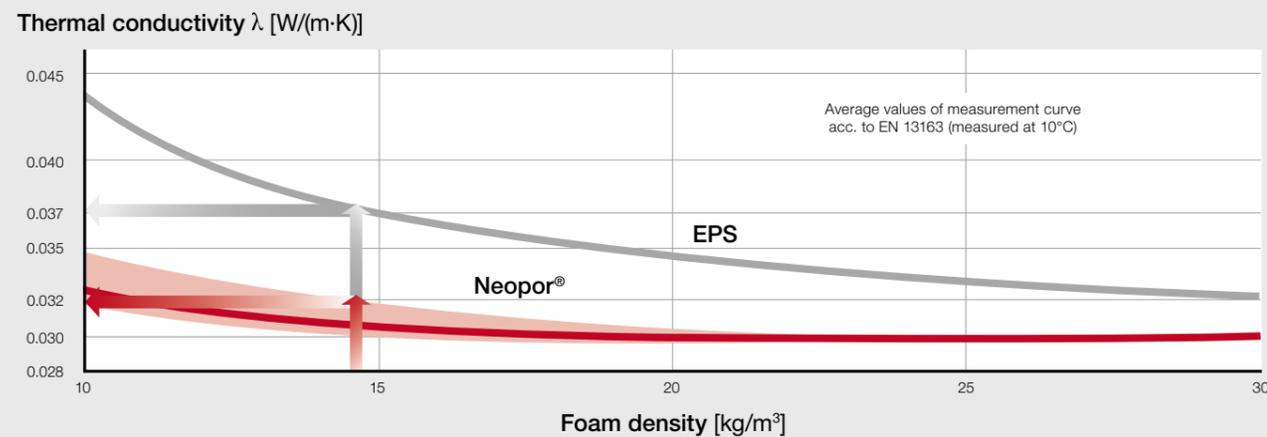
More information can be found [here](#)

### Thermal conductivity:

- Improved thermal conductivity with lower densities.
- Example (see illustration): Insulation materials made of Neopor® with the density 15 kg/m³ achieve a **thermal conductivity of 0.032 W/(m·K)**. The thermal conductivity of conventional EPS with the same density is 0.037 W/(m·K).

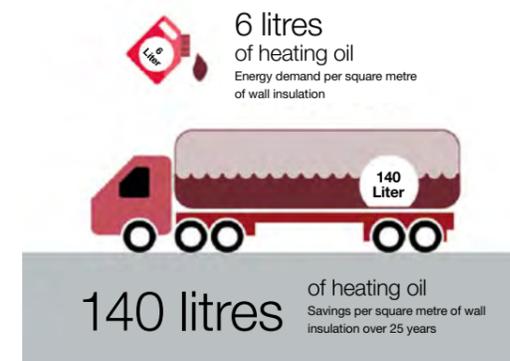


Example: External thermal insulation composite system in Germany.



## Product life cycle – thinking about the next step in advance

- The Fraunhofer Institute for Building Physics proves the durability of external thermal insulation composite systems (ETICS) with EPS of at least 40 years.
- Insulation waste containing PolymerFR is 100 per cent recyclable.
- The energy recovered from EPS is used to generate electricity and district heating.



### Contribution to climate protection

The energy demand for producing 1 m² of wall insulation amounts to 6 litres of heating oil. Over 25 years, 140 litres of heating oil are saved per m² of wall insulation (for ETICS made from 12 cm EPS).\*

Further information at:

<https://www.bkv-gmbh.de/en/infothek/news/artikel/studie-polystyrol-abfaellen.html>

<https://www.ea-etics.eu/etics/long-term-performance/>

\* Source: Hessische Energiespar-Aktion

# BASF's biomass balance approach

## Increased climate protection with no drop in performance

### Advantages of the biomass balance approach

With BASF's biomass balance method (BMB), certified by German technical inspection authority REDcert, the fossil raw materials required for the manufacture of Neopor® can be replaced with renewable feedstock. Production methods of this kind save valuable resources and reduce CO<sub>2</sub> emissions at the same time:

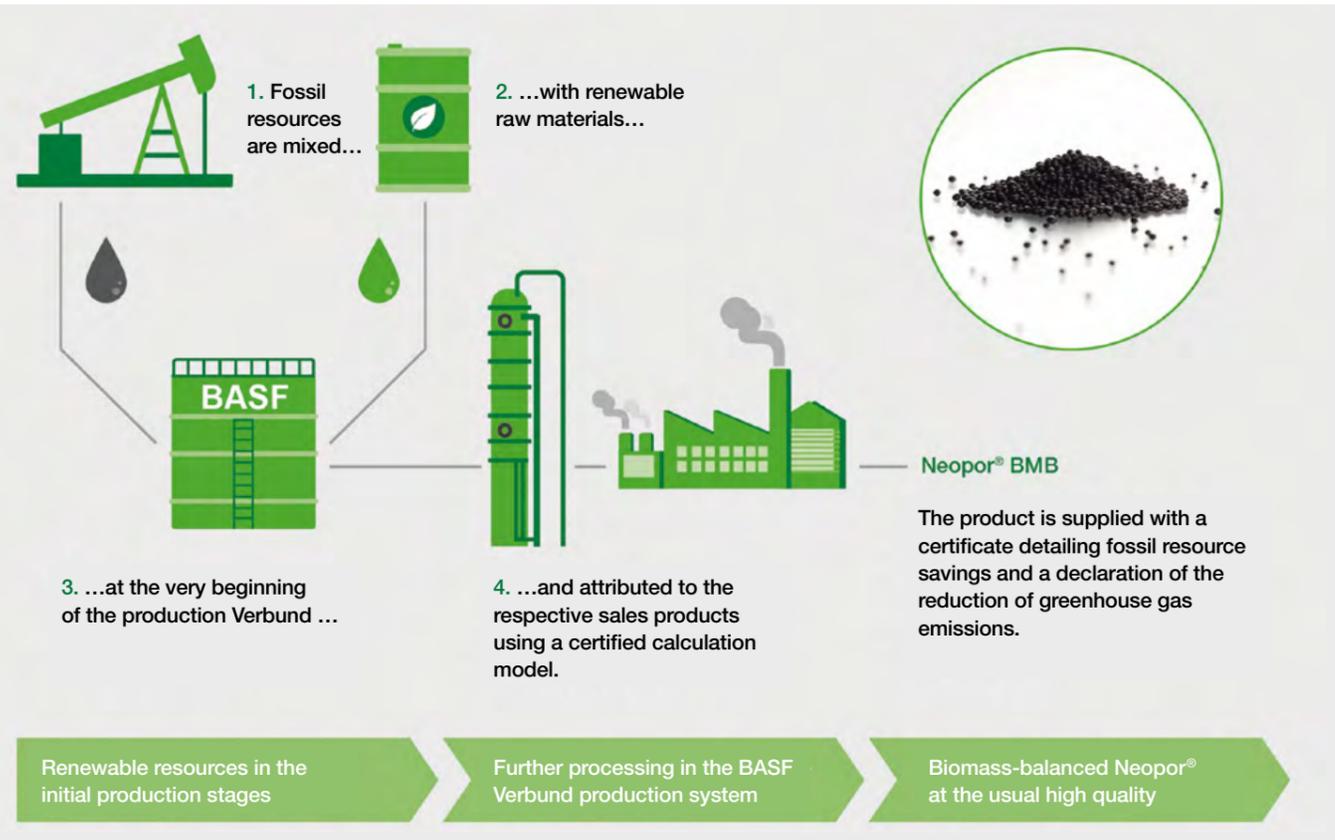
- Reduced CO<sub>2</sub> footprint
- Saves fossil resources
- Independent certification
- Produced in accordance with the requirements of the White Paper published by the Ellen MacArthur Foundation's Circular Economy 100 Network.



### Consistent product quality and properties

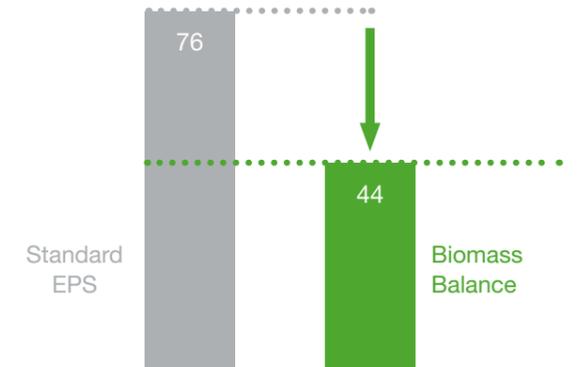
Biomass-balanced Neopor®, known as Neopor® BMB for short, protects the environment and the climate while maintaining its usual high quality. This is because the material's properties are identical to those of its fossil equivalent:

- Excellent thermal conductivity
- Water-repellent
- Resistant to aging and decay
- Easy to handle and quick to process
- Versatile
- Economical



### CO<sub>2</sub> savings with biomass-balanced Neopor®

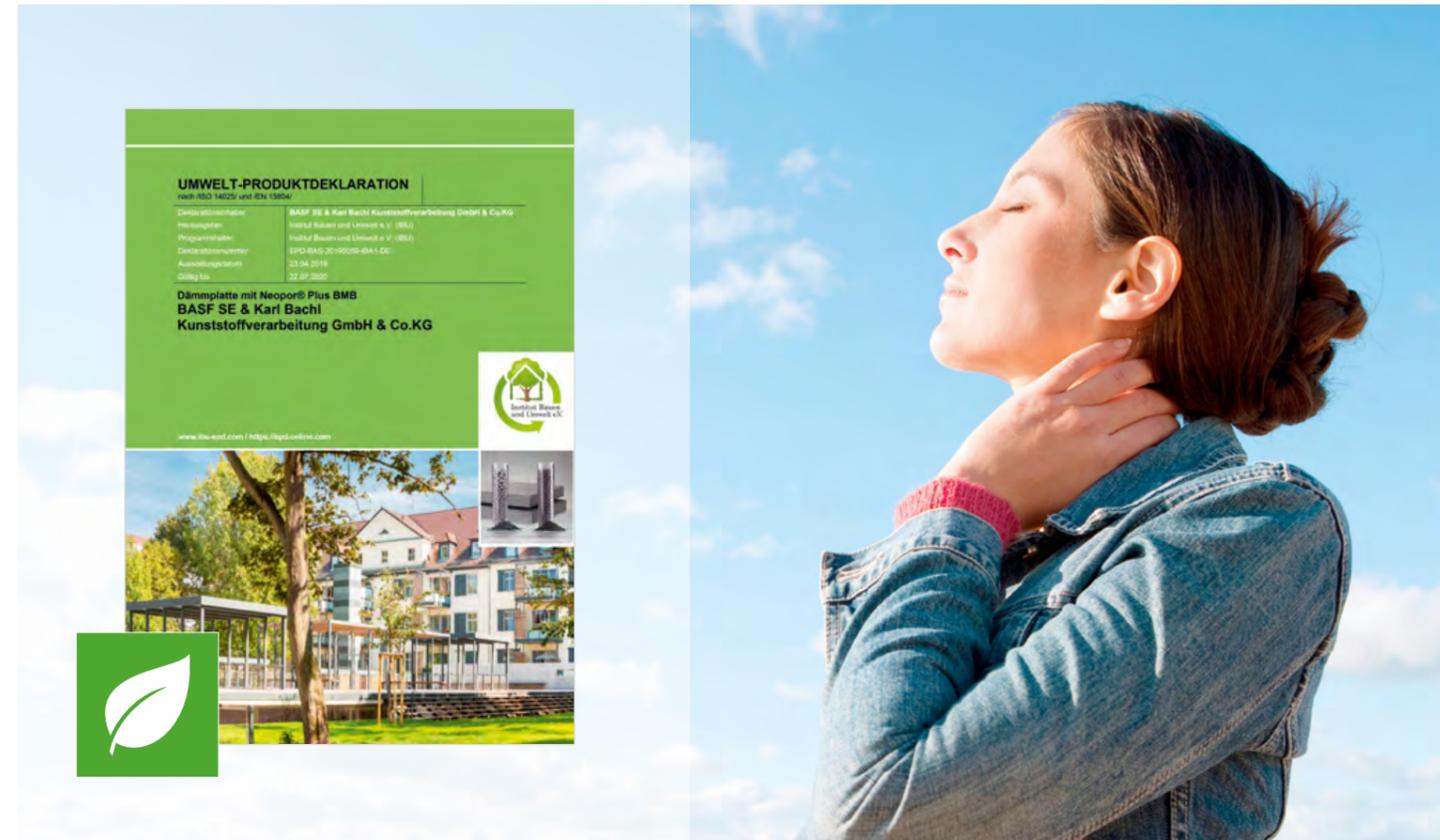
Neopor® BMB reduces CO<sub>2</sub> emissions throughout the life cycle: from production to processing into insulation boards right through to recycling. By comparing 1 m<sup>3</sup> of Neopor® BMB insulation material to the conventional produced insulation material, **CO<sub>2</sub> emissions are reduced by 42 %**. This was confirmed by the German association of product manufacturers, Institut Bauen und Umwelt e.V. (IBU), in an Environmental Product Declaration (EPD) specifically drawn up for insulation materials made of Neopor® BMB.



CO<sub>2</sub> footprint for the life cycle of 1 m<sup>3</sup> insulation board. Calculated in accordance with standard EN 15804: ~15 kg/m<sup>3</sup> product. Unit: kg CO<sub>2</sub> eq./m<sup>3</sup>.

### Further information at:

- <http://www.basf.com/neopor-bmb/en>
- <http://www.neopor.de/epd-neopor-plus-bmb-en>
- <https://www.redcert.org/en>



# Sustainable building with Neopor® throughout the life cycle

## Responsibility along the supply chain: a global code of conduct for suppliers

- Compliance with human rights and occupational and social standards.
- Anti-discrimination and anti-corruption requirements.
- Environmental protection.
- BASF is a founding member of the **Together for Sustainability (TfS)**.

More information can be found [here](#)

## Sustainability through the Verbund

**Production**  
The Production Verbund ensures a competitive supply of key products to all segments with value-added chains rooted in the Verbund.

**Technology**  
The Technology Verbund leverages technological advantages across all segments by breadth, impact, and best in class expertise (e.g. biotech sciences, catalysis, formulation platform).

**Market**  
The Market Verbund creates customer relevance by size and with a broad portfolio, for example automotive/ transportation.

**Digital**  
The Digital Verbund systematically uses and harvests the huge advantages and potential offered by digitalisation throughout the BASF network (data management, scale, artificial intelligence).

More information can be found [here](#)

## The biomass balance approach

- Independent certification by REDcert
- Use of waste based Bio-Naphta or biogas
- Reduced CO<sub>2</sub> footprint
- CO<sub>2</sub> savings as early as the production stage
- CO<sub>2</sub> emission savings of 60 per cent (cradle to gate, A1-A3)
- Produced in accordance with the requirements of the White Paper published by the Ellen MacArthur Foundation's Circular Economy 100 Network.

More information can be found [here](#)

## Recycling of insulation materials at the end of the product life cycle

 Clean polystyrene waste is 100 per cent recoverable or recyclable.

 Heavily soiled EPS undergoes energy recovery and is reused to generate electricity or district heating.

## Recycling

## Good insulation ensures a healthy indoor climate

- Insulating exterior walls increases thermal comfort.
- When used for interior insulation, Neopor® is low-emission, preventing impurities in the indoor air.
- 80 per cent of tenants describe the living comfort in their insulated apartment as "very good" or "good".

More information can be found [here](#)

## Neopor® generates savings



### CO<sub>2</sub> emissions

Studies show that 830 tonnes of CO<sub>2</sub> are saved each year in a renovated housing development.

More information can be found [here](#)



### Cash

Professionally installed insulation reduces heating costs, putting more money in the pockets of families.



### Resources

Since 1980, 92 billion litres of heating oil have been saved through facade insulation.

More information can be found [here](#)

## Lifespan

The Fraunhofer Institute for Building Physics confirms that, if properly maintained, an external thermal insulation composite system (ETICS) with EPS/Neopor® should have a lifespan of at least 40 years.

More information can be found [here](#)



## BASF takes responsibility

The merger of five trade associations and four companies from the plastics industry stands for safe and sustainable building in Europe. BASF is a founding member of the Modern Building Alliance.

Further information at:  
<https://www.modernbuildingalliance.eu/>

Together with other representatives of the polystyrene value chain, BASF supports the PolyStyreneLoop research project to construct a recycling plant for polystyrene waste, which is sponsored by EU-LIFE.

Further information at:  
<https://polystyreneloop.org/>

BASF is implementing the Operation Clean Sweep programme at all its locations worldwide. This is an international initiative by the plastics industry to prevent the release of plastic granulates into the environment.

Further information at:  
<https://www.opcleansweep.org/>

At the start of 2019, BASF founded the Alliance to End Plastic Waste (AEPW) together with around 30 companies. This alliance focuses on four areas: infrastructure development for waste collection, promotion of innovative recycling methods, provision of information to and involvement of various groups, and clean up efforts in areas heavily affected by plastic waste.

Further information at:  
<https://endplasticwaste.org/>



## Tested and certified

### ISO certificates

The production of Neopor® in Ludwigshafen is certified in accordance with the requirements of ISO 9001 and ISO 14001.



### Environmental Product Declaration (EPD) in accordance with ISO 14025 and EN 15804

The Environmental Product Declarations provide the underlying data for assessing the sustainability of buildings.



#### Insulation board with Neopor® Plus

Declaration holder: BASF SE & Karl Bachl Kunststoffverarbeitung GmbH & Co. KG

Issued by: Institut Bauen und Umwelt e.V. (IBU)  
 Programme holder: Institut Bauen und Umwelt e.V. (IBU)  
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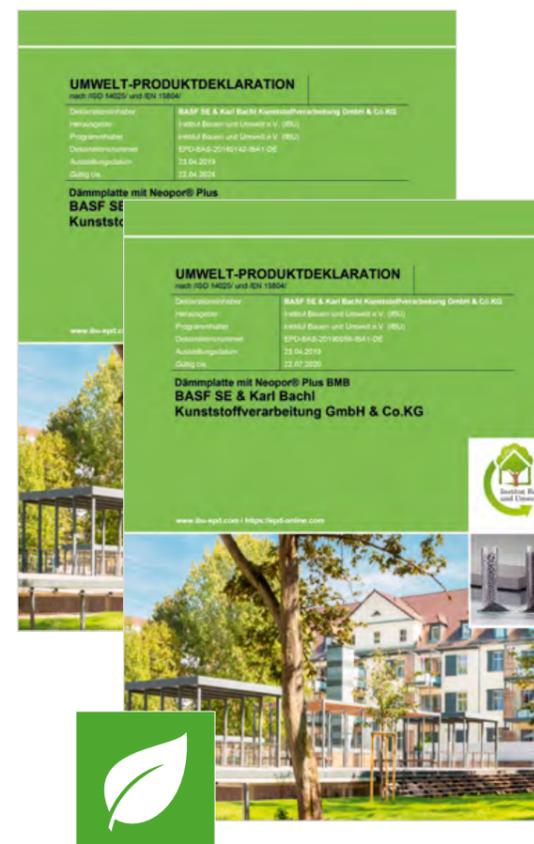
More information on EPD can be found [here](#)

#### Insulation board with Neopor® Plus BMB

Declaration holder: BASF SE & Karl Bachl Kunststoffverarbeitung GmbH & Co. KG

Issued by: Institut Bauen und Umwelt e.V. (IBU)  
 Programme holder: Institut Bauen und Umwelt e.V. (IBU)  
 Declaration number: EPD-BAS-20190059-IBA1-DE  
 Date of issue: 23/04/2019  
 Valid until: 22/07/2020

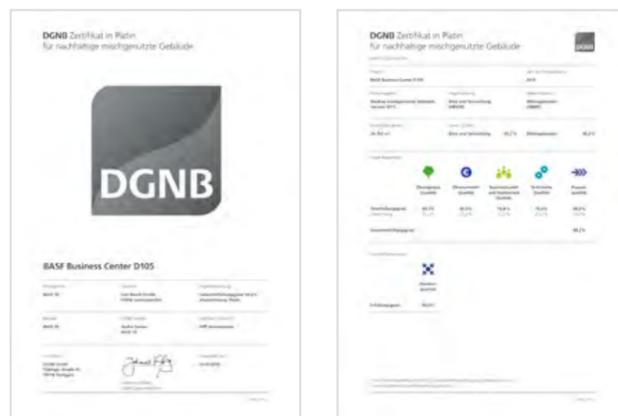
More information on EPD BMB can be found [here](#)



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.

Neopor® fulfils quality levels 1 to 4 for the relevant criteria 35, 41, and 45 for DGNB ENV 1.2, Local environmental impact, 2018 version.



The BASF office building D105, which was opened in summer 2015, offers conference facilities and a modern canteen along with multifunctional offices with space for 1,200 employees. The complex is not only intended for representation purposes, but should also reflect the aspiration of the company – to contribute to a sustainable future.

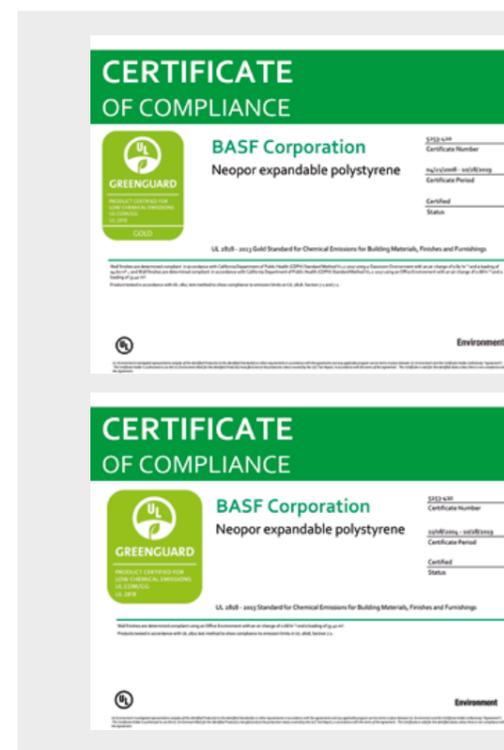
Construction Products Committee (DGNB) has awarded pile D105 with the highest certificate.

GREENGUARD

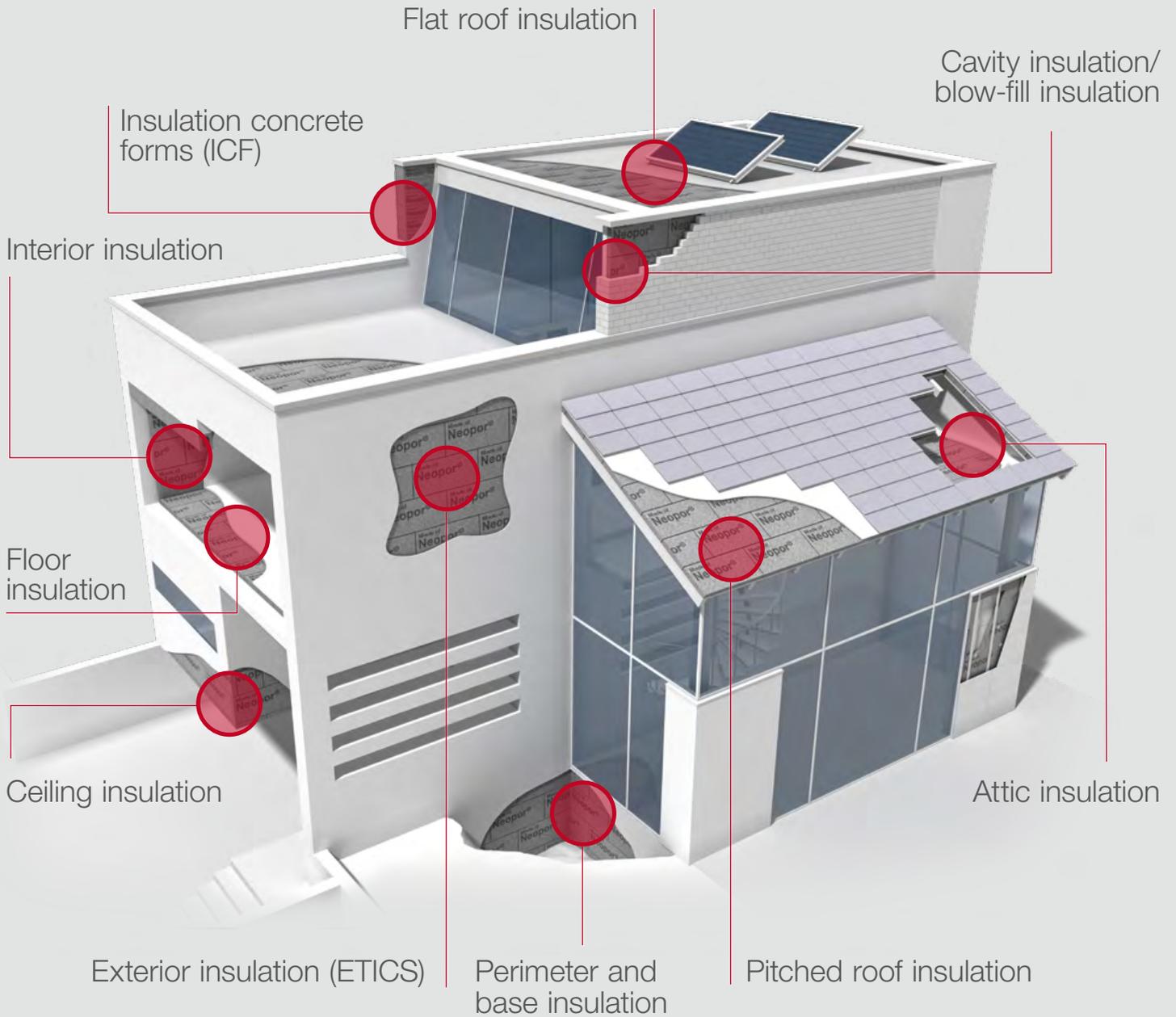
Like all EPS insulation materials used for interior insulation, Neopor® is emission-free and therefore fulfils the most stringent European requirements, such as A+ in the French VOC regulation. This was confirmed by the renowned Eurofins testing laboratory in Denmark. Representative samples for the European market show that the total amount of volatile organic compounds – a maximum of 58 µg/m³ after 28 days – is more than 70 per cent below the most stringent European threshold. In addition, the material does not emit any formaldehyde.

Neopor® therefore fulfils not only the demanding criteria of the GREENGUARD certificate but also the requirements of the Californian Department of Public Health Services. The raw material has therefore been awarded the GREENGUARD Gold certification, which means it is acceptable for use not just in commercial buildings but also in schools or healthcare facilities used by children or elderly people.

Further information at: <http://greenguard.org/en/CertificationPrograms.aspx>



# Diverse range of applications with Neopor®



**BASF SE**  
67056 Ludwigshafen  
Deutschland  
[www.basf.com](http://www.basf.com)  
[www.neopor.de](http://www.neopor.de)

#### Important Note

The information provided in this publication is based on our current knowledge. However, because of the many factors that can influence the processing and use of our product it does not free users from the obligation to carry out tests and trials of their own. No guarantee of certain properties or the suitability of the product for specific applications may be derived from our information. All descriptions, drawings, photographs, data, ratios, weights etc. contained in this publication may change without notice and do not represent contractually agreed properties of the property. Recipients of our product are responsible for observing any existing property rights as well as applicable laws and regulations. (September 2019)

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