Neopor®

Neopor® – the Power of the Original Grey

Our Experience for Your Success

BASF

We create chemistry

CONTENTS

NEOPOR® – MORE THAN JUST A RAW MATERIAL

Neopor® – the Power of the Original Grey

Neopor® is an enhancement of BASF's classic polystyrene foam, Styropor®. The raw material (expandable polystyrene or EPS) contains particles of graphite. This enables the production of insulation boards that perform up to 20 percent more effectively than conventional EPS. The result is an excellent cost/benefit ratio. Neopor is the powerful Original Grey for the thermal conductivity range from 0.030 to 0.035 W/m*K (10°C).

Benefits at a glance:

- Up to 20 percent better insulating performance, enabling the use of correspondingly thinner boards
- Extremely versatile
- Water-repellent, resistant to aging and decay
- Firm and dimensionally stable
- Easy to process and use

Apart from its benefits as a material, Neopor® offers many other advantages:

A Partnership Based on Competence

Our customers and business partners benefit from the many years of experience and extensive expertise of BASF's insulation experts and direct on-site support.

Proven Quality You Can Rely On

BASF continually sets new standards of safety and reliability, driven by its strong research & development capabilities. In addition, customers can rely on support from the Neopor team and technology "Made in Germany." Since Neopor's market launch in 1998, numerous reference projects across Europe have been demonstrating Neopor's outstanding performance. Foam producers, system suppliers, and in the next step planners, architects, and users are on the safe side with Neopor.

Proven High Eco-Efficiency and Cost Effectiveness

Studies have repeatedly shown that Neopor helps to reduce carbon dioxide emissions and increase the energy efficiency of buildings, thus effectively curbing environmental burdens and generating cost savings.


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NEOPOR® – PROVEN EXPERTISE FOR THE FUTURE

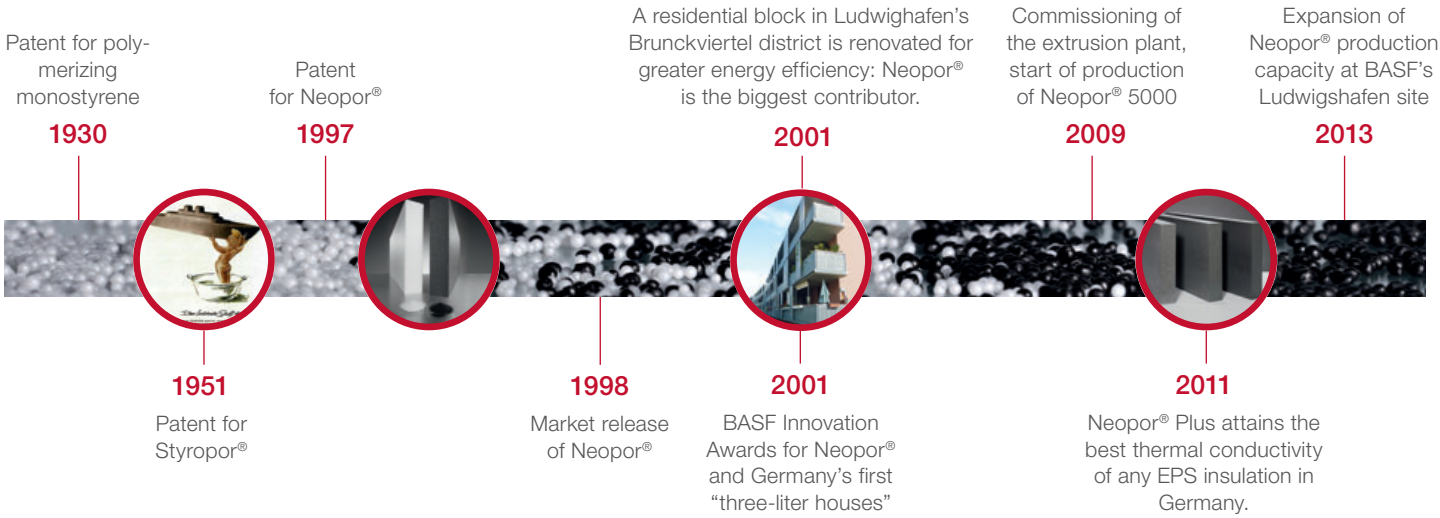
BASF began accumulating expertise on polystyrene foams more than 60 years ago. In 1951, the company's classic white expandable polystyrene product was patented under the name of Styropor®. It set the standard for many insulation and packaging applications. In 1997, BASF took another major step forward when its engineers discovered that the insulating properties of EPS could be considerably improved by enriching the material with tiny particles of graphite. This gave rise to a new product with enhanced performance: Neopor®, which has since become a highly successful brand, demonstrating its performance in a large number of construction projects across Europe.

Customers benefit not only from Neopor's high quality and continual further development, but also from:

- BASF's outstanding research & development infrastructure
- A strong commitment to market development
- Investments to develop new applications
- Work by the Neopor team in the most important European trade associations and bodies
- BASF's pledge to support sustainable construction
- Participation of BASF experts in the German Sustainable Building Council (DGNB), the U.S. Green Building Council, etc.
- Participation in expert groups devoted to topics such as indoor emissions, energy efficiency, and efficient use of resources
- Cooperation with trade associations for publishing environmental product declarations (EPDs) for construction products
- TÜV-validated eco-efficiency analyses (in 2000 and 2013)

BASF, a leading supplier of raw materials, formulations, and systems for the construction industry, supports architects and urban planners throughout Europe in developing and implementing construction and living concepts that meet changing expectations. The goals are to increase the energy efficiency and useful life of buildings, use resources more efficiently in construction, and significantly boost living quality.

These activities in all areas of the EPS and construction industries make Neopor a modern insulation solution with a promising future.

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NEOPOR® – A RAW MATERIAL FOR DIVERSE SOLUTIONS

BASF's Neopor® brand features the broadest product portfolio in the EPS segment. It supplements the traditional Styropor® range but features improved product properties that enable more efficient insulation solutions and deliver greater value for the same money.

In an ongoing dialog with customers, the Neopor team leverages its comprehensive expertise on raw materials, processing, and use to find the right solutions for different applications and processing conditions.

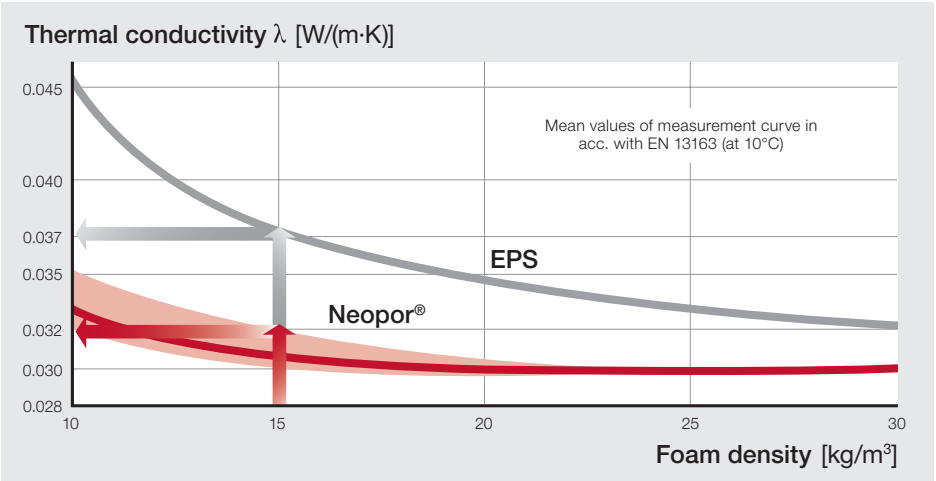
The Neopor portfolio comprises the Neopor® 2000 and Neopor® 5000 series. They are produced by means of two different technologies: polymerization and extrusion.

Neopor® 2000:

- Produced by polymerization
- In the market since 1998
- Characterized by a silver-grey color and spherical beads

Neopor® 5000:

- Produced by extrusion
- In the market since 2009
- Characterized by good processing properties
- Neopor® F 5200/5300 Plus and Neopor® P 5200 with optimized insulation performance
- Neopor® F 5 PRO with low water uptake and short cycle time



A Complete Product Range for All Construction and Packaging Applications

For conventional EPS insulating applications, BASF continues to offer the Styropor® F 15 product types. Optimized cycle and block molding times are achieved with the Styropor® F 95 family. Peripor® rounds out BASF's offering for construction applications. With its low water absorption and extremely short cycle times, this product meets the most demanding requirements.

In addition to serving the construction industry, BASF also offers its EPS products to the packaging industry: for these applications, Styropor® P is an optimal solution with short cycle times and high resistance to mechanical stresses.

NEOPOR® PRODUCT PORTFOLIO

Basic types	Flame retar-dant	Block	Molding	Loose filling	Insulation perfor-mance	Particle size (mm)	Typical density range (kg/m³)	Typical applications
Polymerization - Neopor® 2000 series Pentane content: ~5.3%								
Neopor® F 2200	✓	✓		✓	++	1.4 - 2.5	12 - 20	Exterior insulation (ETICS), cavity wall insulation
Neopor® F 2300	✓	✓	✓	✓	++	0.8 - 1.4	12 - 20	Exterior insulation (ETICS), flat roof insulation, cavity wall insulation, attic insulation, ceiling insulation, steep roof insulation
Neopor® F 2400	✓		✓		++	0.5 - 0.8	16 - 25	Insulating concrete forms (ICF), core insulation, insulation boxes
Neopor® F 4 speed	✓	(✓)	✓		++	0.5 - 0.8	22 - 30	Flat roof insulation, insulating concrete forms (ICF)
Extrusion - Neopor® 5000 series Pentane content: ~5.3%*								
Neopor® F 5300	✓	✓	(✓)		++	0.9 - 1.4	13 - 25	Exterior insulation (ETICS), interior insulation, attic insulation, ceiling insulation, steep roof insulation
Neopor® F 5200 Plus	✓	✓		✓	+++	1.2 - 1.6	13 - 20	Exterior insulation (ETICS, hanging facade), cavity wall insulation
Neopor® F 5300 Plus	✓	✓	(✓)	✓	+++	0.9 - 1.4	13 - 20	Exterior insulation (ETICS, hanging facade), flat roof insulation, cavity wall insulation, attic insulation
Neopor® P 5200		✓		✓	+++	1.2 - 1.5	11 - 20	Interior insulation, cavity wall insulation
Neopor® F 5 PRO	✓	(✓)	✓		++	0.9 - 1.4	25 - 35	Perimeter insulation, flat roof insulation

Neopor P: not flame retardant
Neopor F: products with polymer flame retardant
Neopor F 5200 Plus pentane content: ~5,6%
Neopor F 5 PRO pentane content: ~ 4,5%

STYROPOR® PRODUCT PORTFOLIO

Basic types	Flame retar-dant	Block	Molding	Loose filling	Insulation perfor-mance	Particle size (mm)	Typical density range (kg/m³)	Typical applications
Styropor® F 15 E Pentane content: ~6.0%								
Styropor® F 215 E	✓	✓		✓	+	1.0 - 2.0	12 - 20	Exterior insulation (ETICS), cavity wall insulation
Styropor® F 315 E	✓	✓	✓		+	0.7 - 1.0	12 - 25	Exterior insulation (ETICS), flat roof, attic insulation, ceiling insulation, steep roof insulation, ICF
Styropor® F 415 E	✓		✓			0.4 - 0.7	15 - 25	Decorative ceiling panels, technical moldings
Styropor® F 95 E Pentane content: ~4.5%								
Styropor® F 295 E	✓	✓			○	1.0 - 2.3	15 - 30	Exterior insulation (ETICS), ceiling insulation
Styropor® F 395 E	✓	✓	✓		○	0.7 - 1.0	15 - 30	Ceiling insulation, attic insulation, steep roof insulation, technical moldings, ICF
Styropor® F 495 E	✓		✓		○	0.4 - 0.7	17 - 30	Decorative ceiling panels, technical moldings
Peripor® E Pentane content: ~4.5%								
Peripor® 200 E	✓	✓	✓		○	1.0 - 2.3	25 - 35	Perimeter insulation, flat roof insulation
Peripor® 300 E	✓		✓		○	0.7 - 1.0	25 - 35	Perimeter insulation, flat roof insulation
Styropor® P 26 Pentane content: ~6.0%								
Styropor® P 226		✓	✓		○	0.9 - 1.3	15 - 20	Insulation without flame-retardant requirement, packaging
Styropor® P 326			✓		○	0.7 - 0.9	16 - 25	Packaging, insulated containers (e.g. fish boxes)
Styropor® P 426			✓		○	0.4 - 0.7	16 - 25	Packaging, insulated containers
Styropor® P 656				✓	○	0.2 - 0.4	12 - 15	Aggregate for lightweight plaster

Styropor P: not flame retardant
Styropor F/Peripor: products with polymer flame retardant (suffix E)

NEOPOR® – EXPERIENCE YOU CAN TRUST

The Neopor® team attaches high priority to collaborating with customers. The goal is to offer a powerful package consisting of products, competence in market development, and expertise in processing and applications:

- Support and advice by local field representatives
- Consistently short response times, reliable answering of queries, and meeting of individual customer wishes by in-house Neopor personnel

Staff are directly assigned to customers. They are committed to providing professional service and support to our partners in order to increase their business success.

Technical Support

To make sure that our customers receive the best-performing products for their particular applications, the Neopor team includes not only members for handling all business-related aspects but also competent specialists able to advise them on all technical issues. These experts put their many years of experience and extensive processing expertise to work in order to help customers achieve optimal results with their machines. We provide technical support by:

- Regularly visiting customers
- Recommending analytical laboratories and BASF fire protection experts
- Accompanying customers to producers of processing machines
- Working with customers to test products and make sure their special requirements are met

Development of Applications and Markets

In addition to working with direct Neopor customers, BASF makes its application expertise available to support insulation projects throughout Europe:

- Reliable answering of queries about insulation products and their uses
- Training of customers
- Expertise on fire protection and environmental issues
- Assistance with the application approval process
- Active contributions to creating insulation standards

BASF invented both expandable polystyrene and the first grey EPS. And it remains at the leading edge in developing new products, testing applications, and taking them to market maturity.

When customers face specific technical challenges, the Neopor team works with them to find practicable solutions. Both sides apply their expertise on raw materials, processing, and applications to solve problems at the construction site.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NEOPOR® – A STRONG CONTRIBUTION TO SUSTAINABLE BUILDING

While modernizing a residential block in Ludwigshafen's Brunckviertel district back in 2001, BASF piloted a revolutionary insulating solution that greatly contributes to green construction. The result was Germany's first "three-liter houses" (i.e., consuming only three liters of heating oil per square meter of living space), which combined economic viability with responsible use of natural resources.

The buildings were extensively thermally insulated with Neopor®, which generated the largest savings in heating energy. The "three-liter house" has served as a model ever since. More than 10 years after the renovation project was completed, a study of the most important factors for creating modern living space has confirmed the correctness of the approach and the outstanding performance of Neopor.

High Living Comfort

Tenant surveys have given good marks to low-energy houses.

- High satisfaction with the indoor climate
- The selected building materials contribute to a high level of comfort.

Proven Energy Savings

An analysis of consumption values has shown optimal insulation performance, even after 10 years.

- In all of the buildings, the measured consumption is significantly below the values projected prior to the renovation.

Exemplary Eco-Efficiency

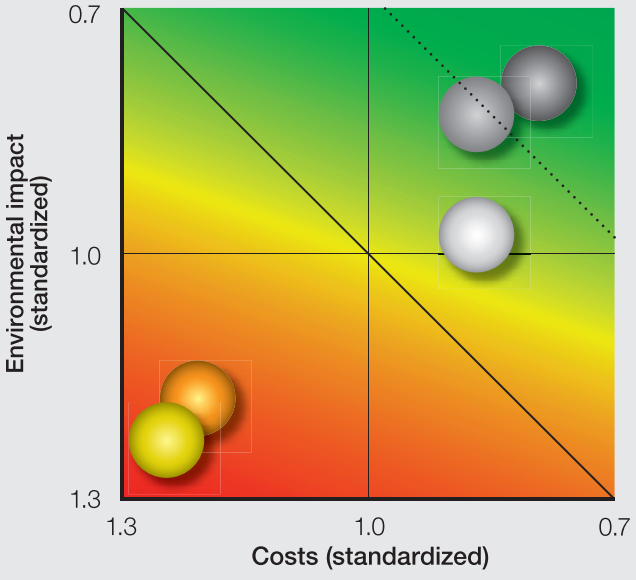
External thermal insulation composite systems (ETICS) with the same insulating performance were compared (in March 2013).

- High eco-efficiency, going easy on both budgets and the environment
- Neopor-based ETICS have been shown to have the highest eco-efficiency.

Proven Long Life

An expert evaluation has certified the good condition of the material.

- The condition of the insulation was assessed by an expert and judged to still be excellent after more than 10 years.



Neopor 032

Neopor 035

Styropor 035

Mineral wool 035

Mineral wool 040

Customer benefit of 1 m² of ETICS with a U value of 0.15 W/(m²·K).

- Scenario with equal environmental and economic relevance
- The dotted line indicates where a product is considered to be just as eco-efficient as the best alternative.

Eco-efficiency analysis BASF 2013 - confirmed by TÜV Rheinland

NEOPOR® – PARTNERSHIPS FOR GREATER SUCCESS

The strongest expression of our commitment to partnership is the Neopor® Brand Alliance.

Our customers have the possibility of concluding a co-branding agreement with BASF for Neopor®. They may then use the label "Made of Neopor® provided by BASF" and profitably leverage this strong brand for their own business. They thus enjoy all benefits of the Original Grey, of having BASF on their side as a reliable and experienced partner, and of the values associated with the Neopor® brand.

Every Neopor Brand Alliance partner is a leader in an application, market segment, region, or innovation and therefore already shares many of the values that the Neopor® brand represents:

- We are reliable partners for efficient insulation solutions.
- We give our customers powerful support.
- We offer products that are characterized by a high and reliable standard of quality.
- We constantly improve our products in order to offer future-proof materials.
- We are committed to acting responsibly toward the environment.
- We aim for long-term, dependable partnerships based on trust.

For more information on the Neopor Brand Alliance, please talk to us!

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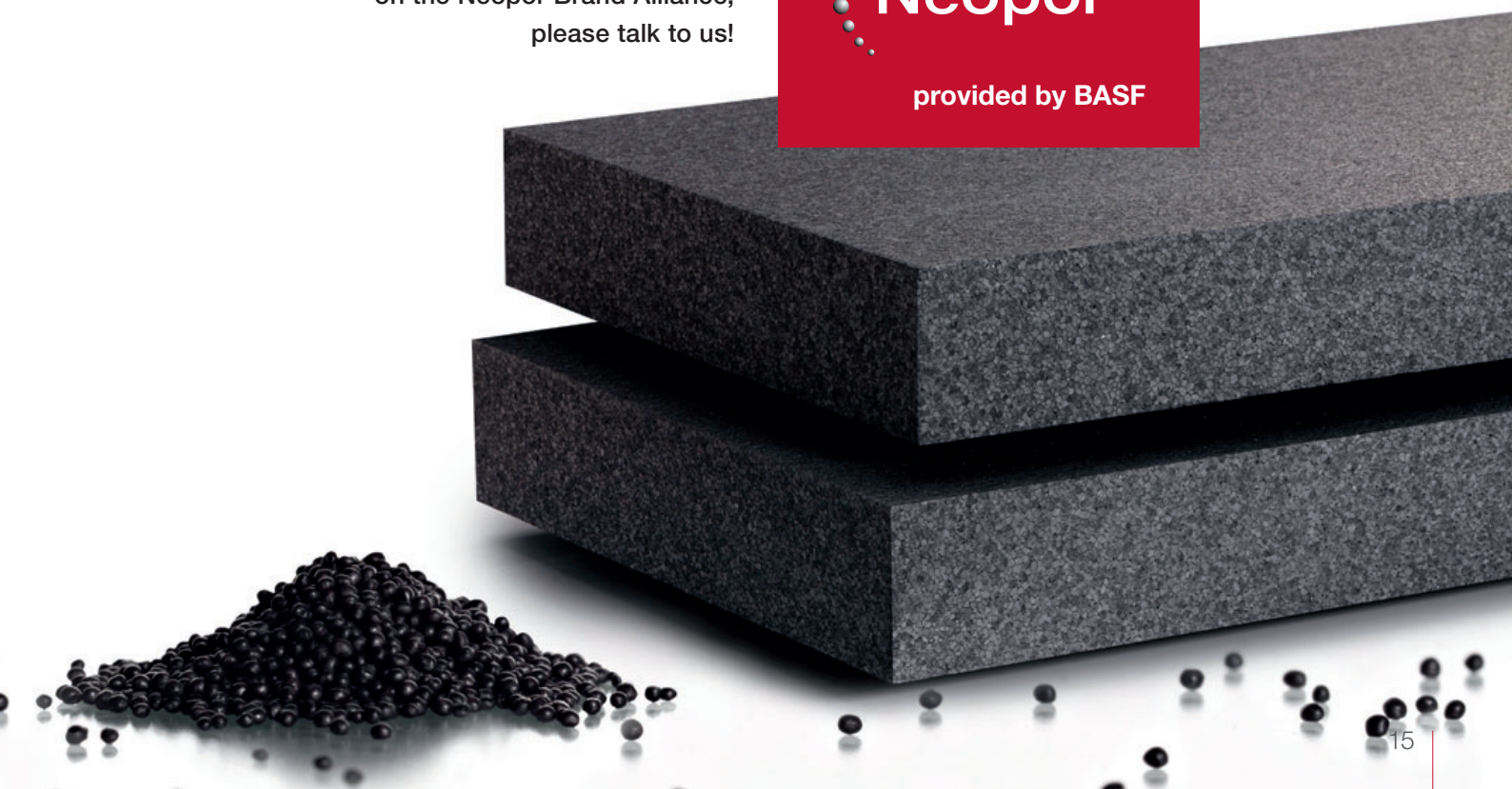
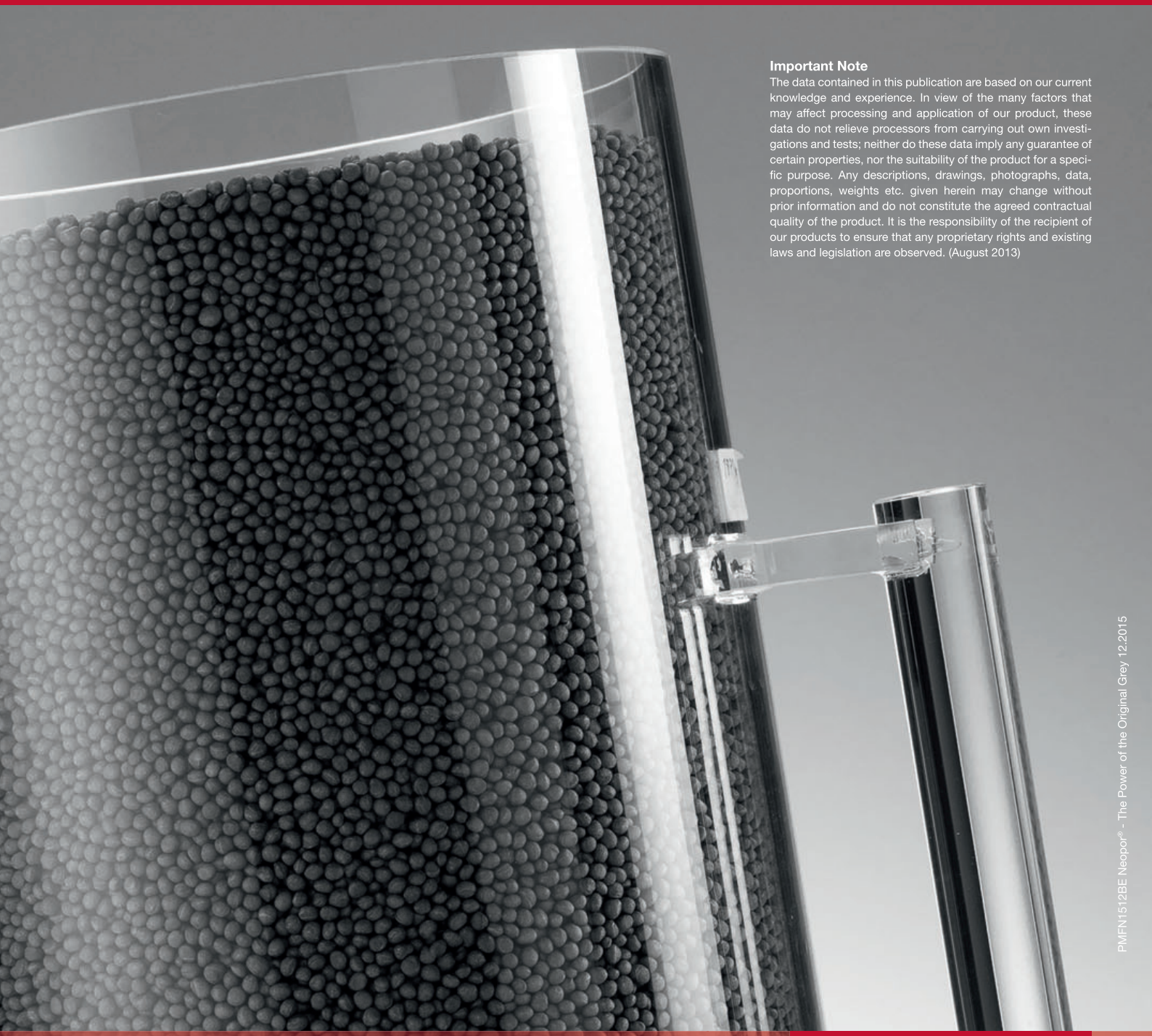


Neopor®



Important Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed. (August 2013)

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