

Werpol EPS Product Line

Specialized Additives for Expandable Polystyrene

- **Pickering stabilizers**

Werpol TCP4
Werpol TCP Liquid

- **Antistatic solutions**

Werpol Antistatikum A
Werpol Antistatikum N
Werpol Antistatikum P

- **IR-active additives:
Masterbatches and pure form**

Werpol MB Graphit
Werpol MB BC
Werbalink Grafit FL
Werbalink Grafit BC

- **Process and Functional Coatings
Werpol G Series - Food and technical grade**

Process Coatings
Functional Coatings

- **Nucleus Builder**

Werpol AWMB
Werpol NB WAS I
Werpol NB WAS II



Werba-Chem:

Sustainable industrial solutions

Werba-Chem GmbH has a long tradition and a strong commitment to the EPS industry. Founded in 1953 by Dr. Hans Werba, the company has its roots in innovation and the development of high-quality chemical solutions. Dr. Hans Werba, a visionary chemist, recognized the potential of expandable polystyrene (EPS) early on and set standards in the industry by introducing new technologies and products.

Art of doing business

Since then Werba-Chem has continuously evolved and is now a leading provider of EPS products and solutions. Our focus is on delivering creative and ecological solutions that help our customers make their processes more resource-efficient.

The EPS product line 'Werpel' is a prime example of our commitment to the industry. From process coatings to functional coatings, customized wax blends, and masterbatches – Werpel stands for innovation and reliability.

At Werba-Chem GmbH, sustainability is a core value that guides our operations and product development. We are dedicated to minimizing our environmental footprint and promoting sustainable practices throughout our supply chain. Our advanced manufacturing processes are designed to reduce waste and energy consumption, while our innovative product formulations aim to enhance the recyclability and longevity of EPS materials. By incorporating eco-friendly additives and developing solutions that support circular economy principles, Werba-Chem not only meets but exceeds industry standards for environmental stewardship.

KEY FACTS:

- **Founded in 1953 by Dr. Hans Werba**
- **Our mission is to support our customers with creative, ecological solutions to make their processes resource-saving. With the knowledge and passion of our employees, we achieve this goal.**



Werpol EPS Product Line

Overview

Our product range is the result of many years of development, driven by the expertise of our technologists and our understanding of the needs of the EPS market. We have our own laboratory for testing and optimizing product parameters, as each polystyrene production line is unique.

Achieving excellent quality EPS resins is only possible when the right additives and their precise proportions are known. We will be your partner in this process.

Our EPS product line Werpol includes five main categories developed to meet the diverse needs of our customers.

ALL PRODUCTS:

- **Reliable Availability:**
We maintain a steady supply to ensure that production processes run smoothly without interruption.

Sustainability at the Core

At the heart of our mission is the development of innovative, sustainable solutions that align with our commitment to environmental responsibility. We are dedicated to carefully selecting raw materials based on strict sustainability criteria and employing cutting-edge technologies that reduce energy consumption during production.

Sustainable Innovation

We focus on sourcing raw materials that are free from mineral oil and meet high sustainability standards. Additionally, we incorporate recycled materials into our production processes to ensure that our products contribute to a circular economy.

Resource-Conserving Manufacturing

Through the use of advanced technologies, we are able to significantly lower energy demand during production. Our manufacturing methods emphasize resource conservation, utilizing renewable energies, minimizing waste, and enhancing efficiency at every stage.

Emission-Reduced Technologies

We place great value on using low-emission technologies, focusing on reducing waste and wastewater to minimize our overall environmental impact. This ensures that our production processes contribute to a cleaner, healthier environment.

Eco-Friendly Logistics

To further support our environmental goals, we optimize our transport operations to significantly lower CO₂ emissions and reduce the ecological footprint of our logistics.

Pickering stabilizers:

Werpol TCP4 and Werpol TCP Liquid

Our **TCP products** are tailored to the needs of specific systems, offering controlled particle size and multiple packaging options. These products are ideal for applications that require precise control and reliability.

Importance in EPS Manufacturing

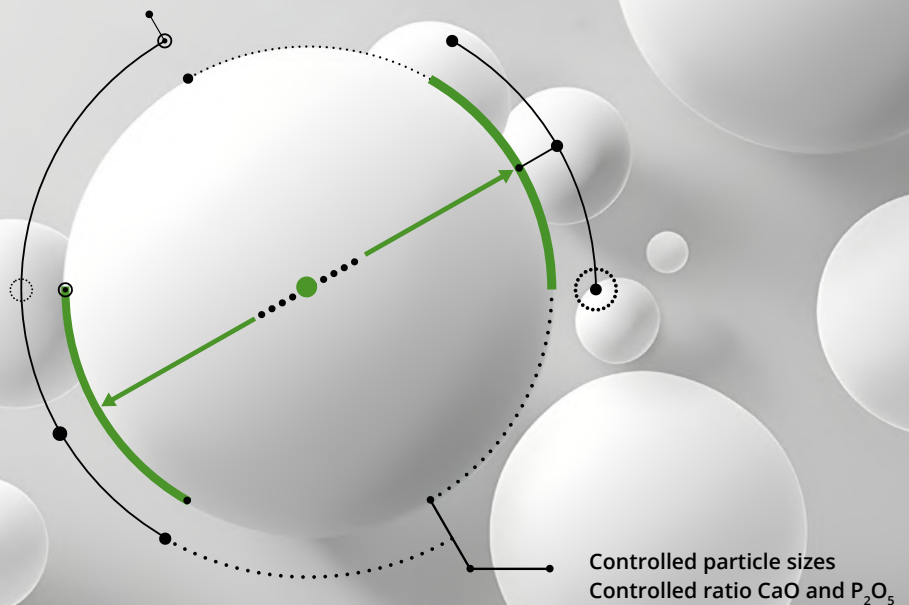
In the context of Suspension Polymerization, the control of particle size is of utmost importance. Pickering stabilizers are solid particles that adsorb onto the interface between two immiscible liquid phases, preventing coalescence and thus stabilizing the emulsion.

During this process, monomer droplets are dispersed in a continuous phase and polymerized to form polymer beads. The presence of Pickering stabilizers ensures that these droplets remain stable and uniformly distributed, leading to a consistent and controlled particle size in the final polymer product. This control is essential for achieving the desired properties and quality of the polymer beads, such as mechanical strength, thermal stability, and application-specific performance.

Our advanced TCP and Pickering stabilizers are designed to meet the stringent requirements of modern polymerization processes, providing our customers with reliable and high-performance solutions.

KEY FEATURES:

- Controlled particle sizes due to enhanced milling systems and effective sieving
- Controlled ratio CaO and P₂O₅



Antistatic solutions

Werpol Antistatikum A Werpol Antistatikum N Werpol Antistatikum P

Processing Antistatic

Our antistatic solution for processing ensures the processability during sieving and transport. The product is designed for applying right after drying.

Importance in EPS manufacturing:

Conveyance

During transport, static electricity can cause EPS beads to clump together, leading to handling difficulties and inefficiencies. By minimizing static buildup, antistatic agents ensure smooth and efficient transport, reducing the risk of material loss and operational delays.

Sieving

In the sieving process, static electricity can cause blockages and uneven particle distribution. The application of antistatic agents makes the sieving process more reliable and effective, preventing clumping and ensuring uniform particle distribution.

Functional Antistatic

Our antistatic solutions can be incorporated into coatings to further enhance the antistatic properties of EPS. This is particularly important for packaging applications in the electronics industry.

Importance in the Electronics Industry:

In the electronics industry, static electricity poses a serious risk to sensitive components. Our antistatic coatings provide a reliable shield against static discharge, ensuring that electronic products are safely transported and stored. By using our advanced solutions, manufacturers can produce high-quality EPS that meets industry standards, enhancing the performance, safety, and overall reliability of electronic products.

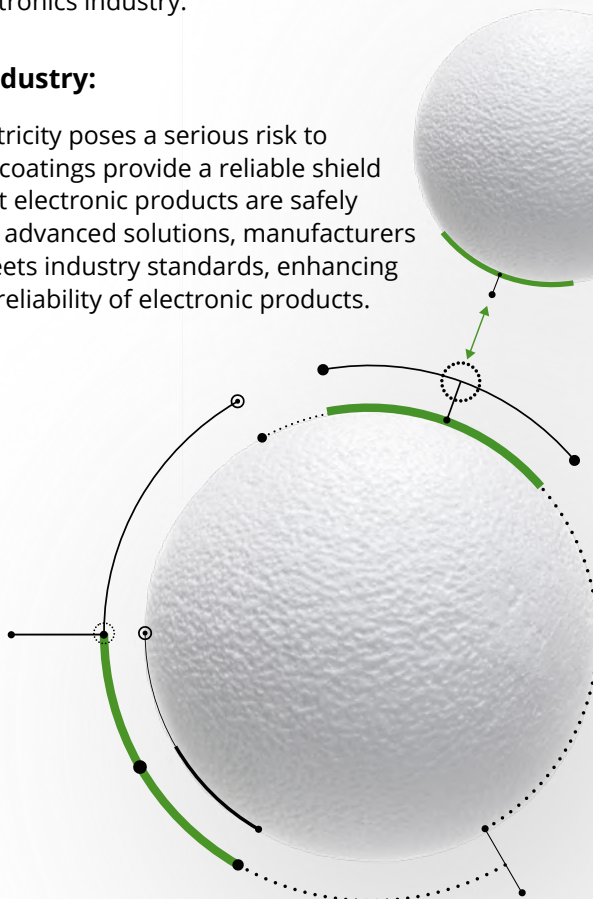
KEY FEATURES:

- **Improved Efficiency:**
Reducing static-related issues leads to smoother production processes, minimizing down-time and increasing overall efficiency.
- **Enhanced Quality:**
Ensuring uniform particle distribution and preventing clumping contribute to the consistent quality of EPS beads.

KEY FEATURES:

- **High concentrated product:**
Controlled dosage of antistatic agents optimizes their effectiveness, ensuring that the exact amount required is used. Dilutions from a working concentrate allows adjustment to specific need.

Antistatic agents providing reliable shield against static electricity



IR-active additives: Masterbatches and pure form

Werpol MB Graphit / Werpol MB BC Werbalink Grafit FL / Werbalink Grafit BC

Our **masterbatches** are a specialty product that allows for the clean and dust-free incorporation of organic and inorganic additives into the EPS structure during suspension polymerization. These masterbatches contain IR-active additives, such as graphite and silica-based components, and offer precise and controlled dosage, easy incorporation, and homogeneous distribution. These properties make them especially suitable for use in transportation or as a coating component, providing effective antistatic solutions.

Our Infra-Red (IR) active additives pure are available in different packages for extrusion production (x-EPS) or batched in GPPS for suspension polymerisation.

Importance of Gray EPS:

Gray EPS has gained significant importance in recent years due to its enhanced thermal insulation properties compared to traditional white EPS. This improvement is due to the inclusion of IR-active additives like graphite and specially prepared silicates which reflect and absorb infrared radiation, thereby reducing the thermal conductivity (Lambda value) of the material.

Our masterbatches, with their advanced formulation, ensure that the benefits of gray EPS are fully realized.

Advantages of Gray EPS:

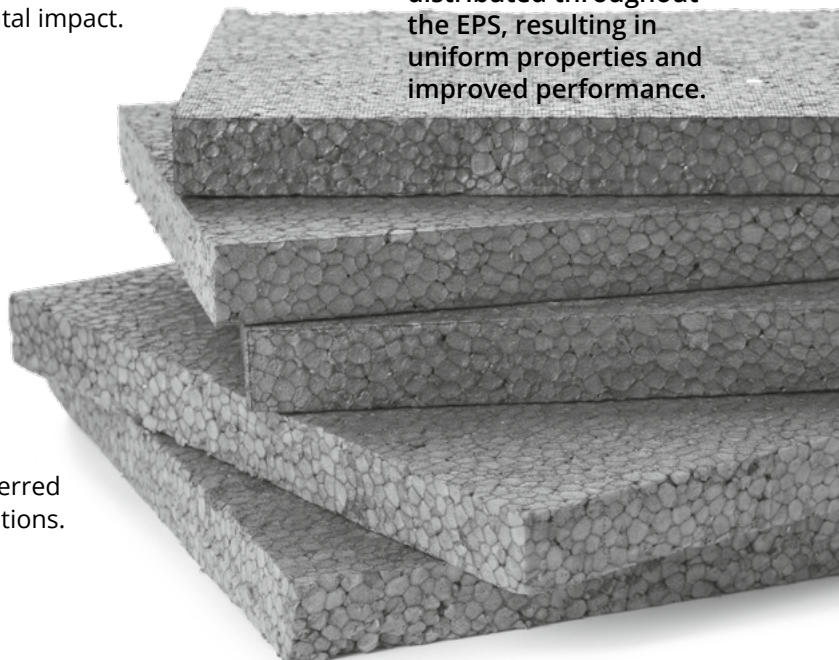
- **Improved Lambda Value:** The incorporation of graphite or specially prepared silicates in gray EPS significantly reduces the thermal conductivity, making it a superior insulating material. A lower Lambda value indicates better insulation, leading to higher energy efficiency in building applications.
- **Enhanced Recycling Potential:** The additives used in gray EPS also contribute to its recyclability. By improving the material properties, gray EPS can be more effectively recycled, supporting sustainable manufacturing practices and reducing environmental impact.

Applications:

- **Construction Industry:** Gray EPS is widely used as an insulation material in buildings, including roofs, basements, and foundations, due to its superior thermal properties.
- **Packaging Industry:** The enhanced mechanical and thermal properties of gray EPS make it ideal for protecting sensitive electronic components during transportation.
- **Recycling Initiatives:** The improved properties of gray EPS support recycling efforts, making it a preferred choice for eco-friendly building and packaging solutions.

KEY FEATURES:

- **Clean and Dust-Free Incorporation:**
The masterbatch form ensures that additives can be incorporated into the EPS structure without generating dust, making the process cleaner and safer for operators.
- **Controlled Dosage:**
Our masterbatches allow for precise control over the amount of additives used, ensuring consistent product quality and performance.
- **Easy Incorporation:**
The masterbatches are designed to be easily integrated into the polymer matrix, facilitating a seamless manufacturing process.
- **Homogeneous Distribution:**
The additives are evenly distributed throughout the EPS, resulting in uniform properties and improved performance.



Process and Functional Coatings

Werpol G Series – Food and technical grade

Process Coatings

Process Coatings are essential for the foaming of EPS beads and subsequent molding. They influence several critical aspects of the final product, including bead expansion, water absorption, static behavior, mechanical strength, and processing time. At Werba Chem, we have developed a proprietary low-temperature milling process that sets our coatings apart from blended products.

Low-Temperature Milling Process:

Werba Chem's unique low-temperature milling process produces homogeneous and highly active coatings. This advanced technique ensures that the particles are finely milled at low temperatures, maintaining their activity and enhancing their performance compared to conventionally blended products.

Customized Formulations:

In our in-house laboratory, we develop custom formulations tailored to meet the specific requirements of each customer. This customization takes into account:

- **Target Density:** Adjustments are made to achieve the desired density of the expanded EPS product.
- **Mechanical Properties:** The formulations are designed to enhance the mechanical properties, such as tensile and compressive strength, of the expanded EPS.
- **Specific EPS Bead Characteristics:** We consider unique properties required for specific applications, ensuring that our coatings meet all performance criteria.

KEY FEATURES:

- **Optimized Bead Expansion:**

Our coatings are designed to ensure the optimal growth of beads during expansion. This is controlled by adjusting the intensity and duration of the expansion process.

- **Improved Water Resistance:**

The coatings form a protective outer layer that prevents water penetration, preserving the insulation performance of the material.

- **Reduction of Electrostatic Charge:**

Components in the coatings reduce electrostatic charge, minimizing clumping and handling difficulties during processing.

- **Enhanced Mechanical Strength:**

The coatings melt into the outer layer of the EPS beads, influencing the strength of the fusion between beads and improving the mechanical stability of the final product.

- **Controlled Processing Time:**

Specific components in the coatings regulate the permeability of pentane, a blowing agent used during expansion, ensuring efficient production.

Functional Coatings

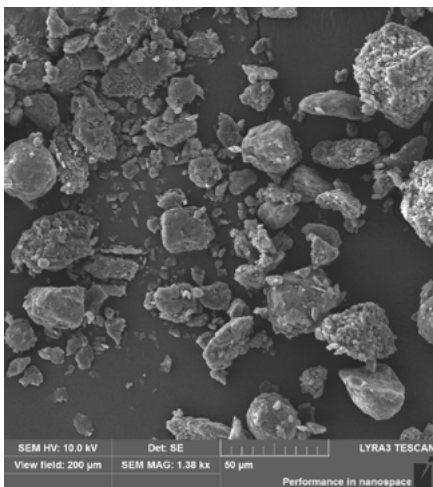
Functional Coatings extend the properties of EPS beads beyond basic processing aspects, offering additional benefits such as waterproofing, increased compressive strength, and antistatic properties.

Customization and Adjustment:

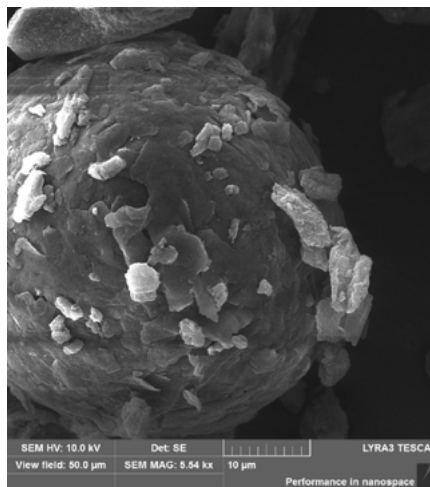
Functional coatings are carefully adjusted to incorporate additional additives while maintaining the necessary proportions for basic processing properties. Typically, the application rate for functional coatings is 3.5 - 4.0 kg per ton of EPS. Our formulations are fine-tuned in our laboratory to meet the specific needs of our customers, ensuring optimal performance in their respective applications.

The process and functional coatings developed by Werba Chem provide superior performance and customization options, thanks to our advanced low-temperature milling process and in-house formulation capabilities.

WERPOL coating – single particle



WERPOL coating – mixed and milled – 4 different additives



Picture of a coated bead – advantages of homogenous coating particle

KEY FEATURES:

- **Waterproof EPS Structures:**

Modern coatings use silica and waxes to seal gaps within the EPS structure, ensuring waterproof integrity. This is particularly important for applications like roof, basement, and foundation insulation.

- **Increased Compressive Strength:**

Specially ground silicates are applied with the coating and melt during expansion, reinforcing the outer shell of the beads and increasing compressive strength.

- **Enhanced Antistatic Properties:**

In addition to the antistatic components in process coatings, functional coatings include highly effective antistatic agents, which are crucial for the packaging industry to protect sensitive electronic components from static discharge.

Nucleus Builder:

Werpol AWMB

Werpol NB WAS I

Werpol NB WAS II

Our **customized wax blends** play a crucial role as nucleating agents in the production of EPS (expandable polystyrene). Nucleating agents are essential in EPS manufacturing process helping control crystallization of the polymer, leading to more uniform cell structures and improved material properties. We offer both polymer waxes and amide waxes, each tailored to meet specific requirements of different industrial applications.

Importance in EPS Manufacturing

In the EPS manufacturing process, the role of nucleating agents cannot be overstated. They are responsible for:

- **Reducing Processing Times:** Effective nucleation can lead to faster crystallization, which reduces the overall processing time and increases production efficiency.
- **Improving Thermal and Mechanical Properties:** Uniform cell structures contribute to better thermal insulation and mechanical properties, making the final EPS products suitable for a wide range of applications, including construction, packaging, and more.

Our customized wax blends, acting as efficient nucleating agents, ensure that our EPS products meet the highest standards of quality and performance. By incorporating our advanced wax blends into the EPS production process, manufacturers can achieve superior product characteristics, making Werpol EPS a preferred choice in the market.

KEY FEATURES:

- **Improved Nucleating Agent Dispersion:**
Our wax blends ensure that nucleating agents are evenly distributed throughout the polymer matrix. This uniform dispersion is critical for creating consistent and high-quality EPS beads with uniform cell structures.
- **Tailormade compositions:**
Our customized wax blends are designed to ensure the best nucleating properties during the polymerization process of EPS.



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We enable sustainable industrial
development with our innovative products.