

QUALITY SUPPORTS.



Technical advice at the highest Level

The Global Competence Centers of LANXESS' Inorganic Pigments support customers and end-users worldwide.

X BAYFERROX[®]
Color for Life.

X COLORTHERM[®]
Color for Life.

X Bayoxide[®]

QUALITY WORKS.

LANXESS

Contact information

We are available for you worldwide and are happy to provide you with the names of our specialists in your area.



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LANXESS inorganic pigments provide a significant added value to our customers. With our wealth of experience and state-of-the-art industry know-how,



we are able to understand our customers' business and with Bayferrox®, Colortherm® and Bayoxide® provide them the optimal solution for their business requirements. Thereby, LANXESS customers can increase their efficiency and productivity, and are even able to develop new products and applications.

Our high quality, innovative products come with the technical service and advice of our Global Competence Centers. With them, our customers have a reliable partner that supports them in becoming increasingly successful in the future.

■ **Joerg Hellwig**

Head of LANXESS Inorganic Pigments

GLOBAL COMPETENCE

LANXESS Inorganic Pigments is one of the world's leading manufacturers of iron oxide and chromium oxide pigments. The products sold under the Bayferrox®, Colortherm® and Bayoxide® brands are characterized by their high and consistent level of quality. At the same time, our production standards ensure that we satisfy the highest sustainability requirements worldwide.

However, our philosophy goes much further than that. We don't just sell pigments, we also offer solutions to technical issues and provide assistance in the event of problems.

As the technology leader in the field of synthetic iron oxide and chromium oxide pigments, LANXESS Inorganic Pigments is the only supplier with a global network of Competence Centers providing our customers with competent and active support with the use of LANXESS pigments. The service portfolio of our Global Competence Centers comprises a wide range of testing and consulting services in the construction, paints and coatings and specialties segments. As a pigments specialist and innovation driver, they enhance the efficiency of our customers worldwide.

Our specialists investigate customer queries under realistic conditions in our comprehensively equipped laboratories. They provide information on optimal pigment selection and processing in the various application systems, and in the event of problems also investigate the causes. They work closely together with our

own sales force and our carefully selected, technically-adept distributors and agents to provide complete global customer support.

We use brochures, technical bulletins, direct discussions and even presentation events to share our many years of experience with our customers. LANXESS regularly conducts workshops for interested customers to resolve specific issues or to train new employees. The staff at the Global Competence Centers also monitor market trends and collaborate with Research and Marketing to develop and introduce new products. As the link between our customers and our Marketing, Research, Production and Logistics units, the staff of the Global Competence Centers contribute to the continuous improvement of LANXESS services and product quality.

■ Research at LANXESS

LANXESS is constantly investing in research and development in order to identify and develop new areas of application for synthetic iron oxide and chromium oxide pigments. The Global Competence Centers collaborate closely with Research, Production and Marketing to take innovations from the concept stage through to market maturity. Our research projects are focused on innovative and high-quality products for both existing and new applications, optimizing the quality of current products, further enhancing the efficiency and sustainability of our processes and improving the further processing of our pigments.

In the pigments field, we have for example developed iron oxide granules that are easier to meter and produce less dust than pigment

powders when used for the coloration of construction materials; furthermore, we offer innovative yellow pigments which provide our customers decisive advantages for processing because they allow for lower viscosities in paints, coatings and pastes. Research is also being conducted into applications that go far beyond the pigmentary properties of iron oxides and chromium oxides. This has produced such products as adsorbers for the removal of arsenic from drinking water and iron oxides for the desulfurization of biogas. Developments for medical applications and products for batteries are other focal points of our innovation efforts. We do not rely solely on our own innovative power and expertise, however, we also collaborate with our customers, with universities, institutes and other industrial partners to bring projects to a successful conclusion.

■ Location of our technical Competence Centers around the globe



GLOBAL COMPETENCE CENTER CONSTRUCTION

LANXESS Inorganic Pigments is one of the largest suppliers of pigments for the construction industry. The high-tinting-strength products from the **Bayferrox® and **Colortherm®** ranges can be used to lend an aesthetic touch to a wide variety of construction materials, including lime-sand bricks, colored sands, in-situ concrete, concrete goods and even asphalt surfacing.**

The color spectrum ranges from yellow to orange, red, brown and green to black. All LANXESS products are characterized by high quality and quality consistency in addition to simple and outstanding processability.

The Global Competence Center Construction is focused on production methods as well as the formulation and quality assurance of colored

concrete materials. It is also involved in the further development of new pigments suitable for use in construction applications. The equipment in the laboratories enables the application technicians to investigate customer queries under realistic conditions. As well as answering questions on the specific use of pigments, the team is also able to advise on various aspects & influences of concrete technology. Additionally the Global Competence Center can offer advice on the handling of the products, from their dosing and transport through to mixing technology.

Testing and any required certification of pigment conformity with the requirements of the standards applicable to the respective area of application are also among the services provided by the Global Competence Center Construction.



Testing the conformity of pigments according to EN 12878 with respect to compressive strength and setting behavior of the colored concrete.



Customer Service Elements

- Pigment testing according to EN 12878
- Determination of setting of pigmented cement
- Strength testing of pigmented concrete
- Color adjustment, matching and formulation
- Solutions to processing problems (investigation of causes in practice-relevant systems, e.g. concrete block paver manufacturer, concrete roofing tile machine, asphalt mixer)
- Determination of solar reflectance
- Support with questions regarding automatic pigment metering, e.g. consulting during the planning and installation of a metering unit

GLOBAL COMPETENCE CENTER PAINTS AND COATINGS



Dispersion and color measurement of pigments in various systems

The high-tinting-strength products of the **Bayferrox®** and **Colortherm®** high performance ranges can be used virtually universally in the paints and coatings sector. On account of their outstanding dispersion properties, systems of a very high pigment concentration are possible. For certain applications (e.g. coil- and powder coatings) we offer special grades from the **Colortherm®**- und **Bayferrox®**-range.

The Global Competence Center Paints & Coatings is the central contact for all questions associated with **Bayferrox®** and **Colortherm®** pigments in coating applications.

The specialists at LANXESS provide tips for optimal pigment selection and help developing tailored solutions for processing in a variety of coating systems. Here, not only the pigment characteristics but also the potential mutual reaction with other formulation components are considered. The range of services also includes starting formulations for pigment mixtures to obtain specific shades (color matching).

Should processing problems occur, the experts at the Global Competence Center Paints & Coatings help to investigate the causes and to present corrective solutions. The team also helps with the pigment conformity testing, e.g. in the event of color and coating-specific complaints.

A close-up photograph of a person's hand holding a brush, applying a thick layer of bright yellow paint to a wooden surface. The person is wearing a white lab coat. The background is slightly blurred, showing more of the wooden structure and some greenery.

Customer Service Elements

- Dispersibility testing in various coating systems
- Measurement of color values
- Measurement of viscosity according to various methods
- Determination of zeta potential
- Recording of the grading curve
- Determination of sieve residue according to DIN EN ISO 787/7
- Determination of the oil absorption according to DIN EN ISO 787/5
- Measurement of the specific surface area via gas adsorption according to BET
- Determination of the pH of the aqueous extract
- Measurement of the electrical conductivity of the aqueous extract

GLOBAL COMPETENCE CENTER COLOR SPECIALTIES – PLASTICS

The pigments used for coloring plastics must satisfy a number of exacting requirements. Applications range from packaging materials, tubes and connecting elements in the construction industry, cockpits and synthetic leather in the automotive industry, synthetic materials in the electronics and electrical industry, artificial turf and synthetic running surfaces on sports fields to artificial wood.

Given the short dwell times and relatively low shear forces in the processing equipment, the pigments must have good dispersibility, i.e. they must be easy to disperse to rapidly reach their final tinting strength. They must also have high thermal stability, must not migrate and their lightfastness and weather stability should be adequate for the intended application.

With the **Colortherm®** brand, LANXESS has for decades offered a range of products developed specifically for the plastics industry that satisfies these demands.

The Global Competence Center Color Specialties supports our customers with the development of formulations and the resolution of specific issues.

The laboratory is very well equipped with single and twin-screw extruders, injection molding machines, rollers, blown- and flat-film lines as well as a hot press, allowing the behavior of pigments in plastics to be investigated under realistic conditions.



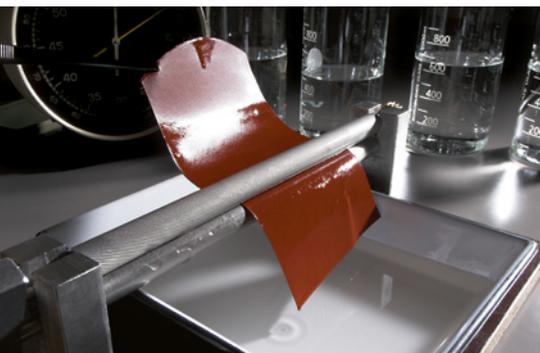
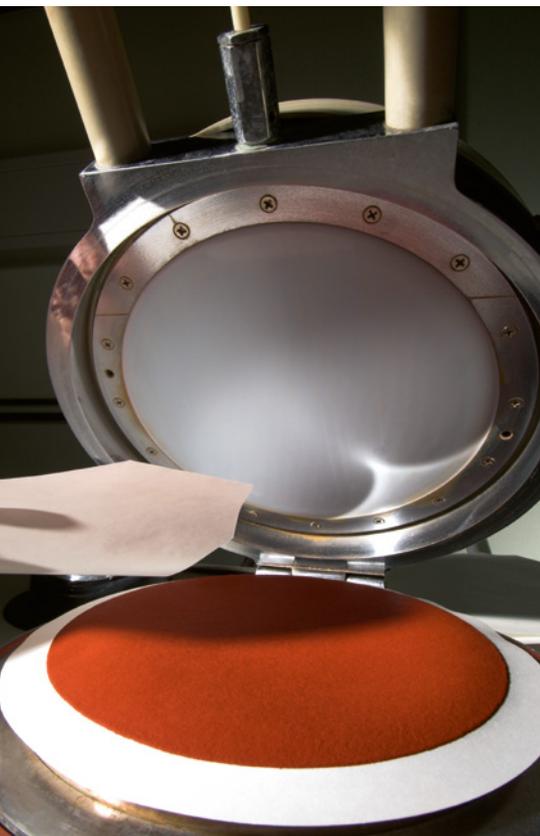
Testing of pigments in a blown film machine; production of test masterbatches at LANXESS



Customer Service Elements

- Coloristics in plastics
 - in flexible PVC
 - in extruded thermoplastics
 - in PVC paste
- Measurement of thermal stability
 - injection molding
 - kneader test
 - heating cabinet
- Dispersibility testing
 - pressure filter test
 - calender test in flexible PVC
 - blown- and flat-film test
 - extruder test
- Light and weather stability testing

GLOBAL COMPETENCE CENTER COLOR SPECIALTIES – PAPER



Production and impregnation of laminate papers.

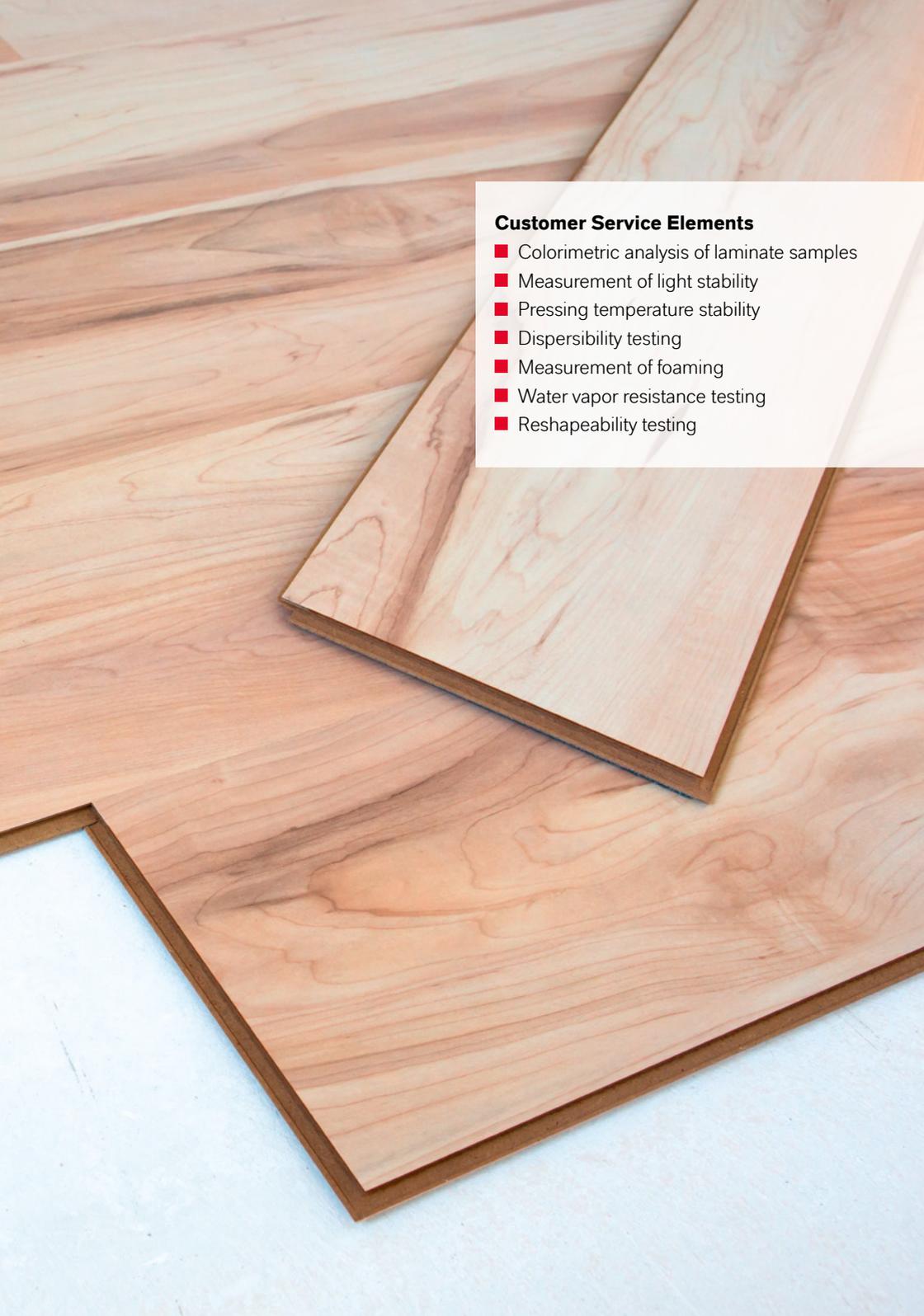
Bayferrox® pigments from LANXESS have long been the benchmark in the paper industry for high quality.

Products for the paper industry are marked with the 'Tested paper quality' seal.

The staff at the Global Competence Center Color Specialties monitor market trends and are in close contact with our customers. They analyze their needs and requirements, and provide the impetus for the development of new products. The Global Competence Center Color Specialties is realistically equipped for the production of colored papers and laminate samples, which are subjected to a comprehensive series of tests following preparation. It provides support with the development of formulations and color matching, the resolution of metering and bulk handling issues, analytical questions and customer-specific problems.

The analysis of pigment properties in laminate begins with the preparation of a test paper, which is then impregnated and pressed. The pressed decorative layer produced then undergoes the required tests.

As well as the traditional applications of Plastics & Paper the Global Competence Center Color Specialties offers products for applications with very specific requirements e.g. decorative cosmetics, coloration of seeds and fertilizers.

The image shows several pieces of light-colored wood-grain laminate flooring. One piece is in the foreground, partially overlapping another piece behind it. The wood grain is clearly visible, showing natural-looking patterns and colors. The background is a plain, light-colored surface.

Customer Service Elements

- Colorimetric analysis of laminate samples
- Measurement of light stability
- Pressing temperature stability
- Dispersibility testing
- Measurement of foaming
- Water vapor resistance testing
- Reshapeability testing

GLOBAL COMPETENCE CENTER TECHNICAL OXIDES

For technical applications, LANXESS offers the comprehensive Bayoxide® E and range of products that have been developed for very diverse markets, industries and requirements.

With these products, color plays no role to chemico-physical properties such as purity, hardness, reactivity or magnetism.

Our technical oxides are used in a number of diverse applications including toners for laser printers and copiers, in biogas desulfurization, in batteries, brake pads and air bags as well as in refractory products and ceramic pigments.

The Global Competence Center Technical Oxides supports our customers with the optimization of their technical oxides and the resolution of specific issues. The Center works with LANXESS Research to develop tailored oxides

satisfying the specific needs of individual customers, and new areas of application are developed in close collaboration with partner companies.

Year on year we develop solutions together with our partners worldwide in which our Bayoxide® pigments help the users to design the optimum end-products for their markets. This would not be possible without a network of experts at LANXESS that understand and speak the customer's language.

Amongst the tasks of the Global Competence Center Technical Oxides is the discovery and development of totally new application areas, giving support to research establishments & institutes, the membership of various technical associations and participation at various congresses.



Testing of Bayoxide® adsorbers for water purification



Customer Service Elements

- Testing of physical and chemical properties of pigments and oxides
- Characterization and analysis of toners
- Formulation recommendations
- Metering recommendations for desulfurization products
- Development of solutions to processing problems
- Field tests



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Health and safety information

Appropriate documentation was compiled with information on the health and safety measures that have to be observed in handling the LANXESS products mentioned in this brochure. For materials mentioned here that are not LANXESS products, the operational hygiene and other safety measures recommended by the respective manufacturers must be observed. Before working with these products, you must read and familiarise yourself with the available information on their dangers, proper use and handling. This point is of decisive importance.

Information is available in various forms: such as safety data sheets, product information and product labels. Please contact your LANXESS representative in Germany or the Department of Regulatory Affairs and Product Safety of LANXESS Deutschland. For business in the USA, please contact the LANXESS Product Safety and Regulatory Affairs Department in Pittsburgh, Pennsylvania.

Information on Regulatory Compliance

For some end use purposes of the products found in this brochure, the applicable regulations must be observed, including those of the FDA, BfR, NSF, USDA and CPSC. If you have any questions regarding the approval status of these products, please contact your representative at LANXESS Deutschland GmbH or the Department of Regulatory Affairs and Product Safety of LANXESS Deutschland GmbH or, for business in the USA, your representative at LANXESS Corporation, the LANXESS Regulatory Affairs Manager in Pittsburgh, Pennsylvania.

How and for which purposes you utilise our products, our technical support and our information (oral, written or through product assessments) is beyond our control. The same applies for suggested formulations and recommendations. Therefore it is indispensable that you check our products, our technical support and our information for their suitability for the intended processes and purposes. The application-specific analysis must encompass at least suitability tests in regard to technical as well as health, safety and environmental aspects. Such testing has not necessarily been done by us. Unless agreed to otherwise in writing, all products are sold exclusively in accordance with our general terms and conditions for sale and delivery. Information and technical support are provided without warranty (we reserve the right to make changes at any time). It is expressly agreed that you release us from any possible liability resulting from the use of our products, technical support and information due to fault, contract or other reasons and that you assume this liability yourself.

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