

Reliable coloration of ultra-high-performance concretes thanks to Bayferrox pigments from LANXESS

- **Inorganic pigments certified for use in UHPC**
- **Enhancing the attractiveness of this sustainable construction material**

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Cologne, April 27, 2021 – Ultra-high-performance concretes (UHPCs) are reckoned to be the construction material of the future. When they are colored, however, you have to ensure that the prescribed compressive strength of more than 150 megapascals is still achieved. The iron oxide pigments from LANXESS's Bayferrox brand are perfect for UHPCs, as has been verified by the association of German cement manufacturers (VDZ) based on an analysis of compressive strength conducted to DIN EN 12390-3.

“Architects and clients can have every confidence in our high-quality pigments for coloring UHPC,” says Oliver Fleschentraeger, Market Segment Manager Construction of the Inorganic Pigments business unit at LANXESS. The iron oxide pigments come in red, yellow, and black, with numerous color nuances possible within these shades. “As far as we know, Bayferrox pigments are the only iron oxide pigments on the market that are specially certified for use in UHPC,” says Fleschentraeger.

Pressure-resistant, colorful, and environmentally sound

The quantity of materials used is a key metric when it comes to assessing a building's carbon footprint. Not only the choice of materials but also the production chain and construction process are also crucial. So to save materials and energy and to reduce CO₂ emissions during manufacture, planners and architects are increasingly using highly sophisticated high-performance components made from UHPC. In addition to the enormous resource savings of up to 80%, material-friendly designs reduce carbon dioxide emissions in the manufacturing phase by up to 30%. “A significant and pleasing side effect of UHPC is its high resource efficiency, which makes it easier for engineers to meet the demand for sustainable designs,” says Dr. Michael Olipitz, a certified expert in the fields of superstructure, bridge-building, steel

structures and structural engineering, and General Manager of the engineering office SDO ZT GmbH based in Graz, Austria. Inorganic iron oxide pigments can provide long-lasting visual enhancement to these structures or even effectively contextualize them with their surroundings – without affecting the rheology or flow behavior of the concrete.

Delicacy and solidity go hand in hand

One spectacular architectural application of colored UHPC is the Museum of Civilizations of Europe and the Mediterranean (MuCEM) in Marseille, in the south of France. With the exception of two glazed facades, the museum – including most of the roof – is encased in a lattice-like concrete structure comprising concrete panels just 10 centimeters thick. The French architect Rudi Ricciotti made a conscious decision to color the concrete dark gray to lend the building its own identity within its surroundings and as a stark contrast against the color of the facade. The precast concrete elements were colored with Bayferrox 330 and Bayferrox 318 from LANXESS.

Another benefit of the high-quality Bayferrox pigments is that the concrete, once colored, retains its characteristic texture and exhibits subtle color nuances, lending the surface a natural appearance. In addition, there are no layers of paint that can flake off of the surface through wear and weathering. Even if the surface is slightly damaged, the color remains as vivid as ever. This is why iron oxide pigments are the perfect choice for coloring ultra-high-performance concretes, which, with a projected lifetime of more than 150 years, are around twice as durable as conventional concrete.

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Image



Color optimization in the application technology laboratory at LANXESS's site in Krefeld-Uerdingen. The lattice-like precast concrete element made from ultra-high-performance concrete (UHPC) is colored yellow using Bayferrox pigments. Tests prove that the strength of the meshed concrete structure is unaffected by the pigmentation. Photo: LANXESS AG

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