QUALITY COLORS.

Global Shade Card
Inorganic Pigments for
Coloration of Building Materials

BAYFERROX® Color for Life. COLORTHERM® Color for Life.

QUALITY WORKS. LANXESS Energizing Chemistry

COLOR PIGMENTS
FOR CONSTRUCTION

The choice of pigment is crucial for the coloration of concrete building materials. Years of observing colored concrete products at numerous locations, under varied climatic conditions have demonstrated the excellent fastness properties of inorganic oxide pigments. LANXESS offers iron and chromium oxide pigments under the names Bayferrox® and Colortherm®. Due to their chemical composition and structure, they are insoluble in water and dilute acids as well as resistant to lime and alkalis. LANXESS oxide pigments are definitively weather and light-stable, making them ideally suited for the coloration of building materials.

For almost 100 years, LANXESS iron and chromium oxide pigments have been well-established in the construction industry. The high tinting-strength products of the Bayferrox® and Colortherm® product lines are used to impart an aesthetically pleasing appearance to ready mix concrete, pre-cast concrete, architectural block, concrete roofing tiles and concrete pavers. The color range includes yellows, oranges, reds, greens, browns and blacks with a wide variety of additional shades in between. Pigments are available in four delivery forms: powder, granules, compacted and liquid pigments.

For the production LANXESS use a broad range of production technologies at its site in Krefeld-Uerdingen, Germany. A highlight is the unique Laux Process which covers a wide spectrum of red tones. These pigments stand out clearly from other products on the market because there is no perceptible color shift even when intensive dispersion methods are used.

The pigment requirements are different depending on product use. Unreinforced concrete (Category A) such as concrete roofing tiles or concrete pavers would differ from steel reinforced concrete (Category B) and other loadbearing concrete components.

Pigments used in building materials must comply with the relevant regulatory standards. Our inorganic pigments meet or exceed even the highest requirements of industrial standards such as DIN EN 12878 and ASTM C 979. Conformity with the requirements regarding factory production control and the associated measures is monitored annually by an independent, certified testing institute (notified body). Consequently, our pigments are labeled with the CE mark.

Leading in safety and environmental responsibility

LANXESS regards the sustainability of its products and processes as absolutely essential. Our production processes have always been designed to conserve resources and preserve the environment – and to be safe and sustainable:

- Every year we commission an internationally recognized certification institute to perform an objective assessment of our global production network. All production facilities are certified to DIN ISO 9001 and ISO 14001.
- Our iron oxide pigments have achieved recycled content certification from SCS Global Services, a benefit to customers with a LEED or green building-driven purchasing strategy.
- LANXESS is listed in the leading sustainability indices Dow Jones Sustainability Index (DJSI World) and FTSE4Good. For our sustainability performance, we have also been awarded with the "Gold" category of EcoVadis' sustainability rating.

Unparalleled technical support

LANXESS provides technical advice regarding the use of Bayferrox® and Colortherm® inorganic pigments. Our technical experts investigate customer inquiries under realistic conditions in comprehensively equipped laboratories. The portfolio includes various services:

- Strength testing of pigmented concrete
- Color adjustment, matching and formulation
- Determination of solar reflectance

In addition, our experts offer advice on the handling of the Bayferrox® and Colortherm® pigments, from their dosing and transport to mixing technology.

The colors in this brochure are only a selection of the most popular shades in concrete or mortar applications. Raw materials, production parameters and surface texture have a tremendous effect on the final color and SRI value. LANXESS recommends testing with applied raw materials and mix design under specific production conditions. Please get in touch with your local sales contact for further information.

 All items are provided as general information only. They are approximate values and are not considered part of the product specifications.

	3 % Pigment in Gray Cement	3 % Pigment in White Cement
Bayferrox® 110		
Bayferrox® 120		
Bayferrox® 130		
Bayferrox® 140		
Bayferrox® 160		
Bayferrox® 180		
Bayferrox® 222		
Bayferrox® 225		

	3 % Pigment in Gray Cement	3 % Pigment in White Cement
Bayferrox® 306		
Bayferrox® 318		
Bayferrox® 330		
Bayferrox® 340		
Bayferrox® 360		
Bayferrox® 420		
Bayferrox® 910		
Bayferrox® 920		

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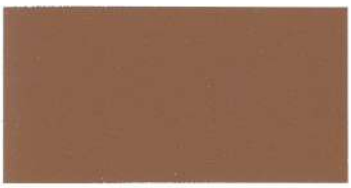
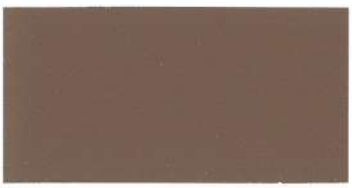
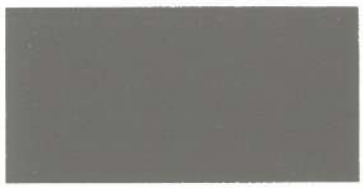
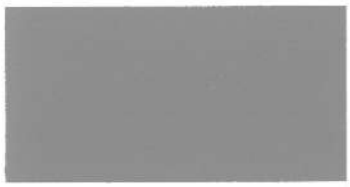
	3 % Pigment in Gray Cement	3 % Pigment in White Cement
Bayferrox® 930		
Bayferrox® 960		
Bayferrox® 610		
Bayferrox® 640		
Bayferrox® 663		
Bayferrox® 686		

HEAT RESISTANT
SPECIAL PIGMENTS

	3 % Pigment in Gray Cement	3 % Pigment in White Cement
Bayferrox® 950 (heat resistant up to 300 °C)		
Bayferrox® 303 T (heat resistant up to 500 °C)		
Bayferrox® 645 T (heat resistant up to 500 °C)		
Colortherm® Green GN (heat resistant up to 1000 °C)		

[1] X-ray fluorescence

[2] The water absorption indicates the amount of water bound by 100 g of pigment. It is determined by the same method as the oil absorption (DIN ISO 787/5). The linseed oil being merely replaced by water. Given values are guide figures only.

[3] Solar Reflectance Index (SRI) is the value that incorporates both Solar Reflectance and Thermal Emittance in a single value to represent a material's temperature as a result of solar radiation. SRI quantifies how hot a surface could get relative to standard black and standard white surfaces. All SRI values listed in this publication were determined from samples made using a medium gray Portland cement. The final color and Solar Reflectance Index (SRI) value of pigmented concrete may not match that which is shown on this card. Changes in the base color alone – which can result from variations in cement, fillers, aggregates, water content, admixtures, release agents etc. – can have a distinct effect on the final color and SRI value. Therefore, the SRI values listed in this brochure are only indicative. LANXESS strongly recommends testing with your raw materials and mix designs under conditions that are specific to your production method.

[4] Heat stable pigments, suitable for sand granules (1000 °C) and autoclaved building materials (e.g. sand lime bricks) etc.

[5] Bayferrox® Yellow pigments are also suitable for autoclaved building materials e.g. sand lime bricks.

TECHNICAL DATA

BAYFERROX® Color for Life. COLORTHERM® Color for Life.

Grade	Compact pigment	Granules	Water-soluble contents IN EN ISO 787/3: 2000 [max. %]	Sieve residue on 45-µm mesh DIN EN ISO 787-7: 2009 [max. %]	Iron oxide content[1] (approx. values)	Predominant particle size [µm]	Oil absorption[2] (approx.) DIN EN ISO 787-5: 1995 [g/100 g]	Tamped apparent density DIN EN ISO 787/11: 1995 [g/cm³]	Density (approx.) DIN EN ISO 787/10: 1995 [max. g/cm³]	Solar reflectance index (SRI)[3] (approx.)
Bayferrox® Red[4] C.I. Pigment Red 101 (77491)										
110	110 C	110 G	0.5	0.06	97.1% (Fe_2O_3)	0.09	28	0.7–1.1	5.0	31–34
120		120 NG	0.5	0.06	97.1% (Fe_2O_3)	0.12	28	0.7–1.1	5.0	31–34
130	130 C	130 G	0.4	0.06	97.2% (Fe_2O_3)	0.17	26	0.7–1.1	5.0	31–34
140			0.4	0.06	97.2% (Fe_2O_3)	0.3	26	0.9–1.3	5.0	31–34
160			0.4	0.06	97.2% (Fe_2O_3)	0.4	25	1.0–1.4	5.0	31–34
180		180 G	0.3	0.06	97.3% (Fe_2O_3)	0.7	24	1.3–1.7	5.0	31–34
222			0.5	0.1	99.1% (Fe_2O_3)	0.2	15	1.4–1.8	5.0	30–33
225			0.5	0.1	99.1% (Fe_2O_3)	0.2	18	1.4–1.8	5.0	30–33
Bayferrox® Black C.I. Pigment Black 11 (77499)										
306			0.5	0.05	97.0% (Fe_3O_4)	0.5	24	1.0–1.4	4.6	11–12
318		318 G	1.0	0.1	96.5% (Fe_3O_4)	0.2	21	0.8–1.2	4.6	10–11
330	330 C	330 G	1.75	0.1	95.8% (Fe_3O_4)	0.15	21	0.8–1.2	4.6	8–9
340		340 G	1.75	0.1	95.8% (Fe_3O_4)	0.15	21	0.8–1.2	4.6	8–9
360			0.5	0.1	99.5% (Fe_3O_4)	0.3	15	1.2–1.6	4.6	7–8
Bayferrox® Yellow[5] C.I. Pigment Yellow 42 (77492)										
420			0.5	0.05	99.2% (FeOOH)	0.1 x 0.7	43	0.4–0.8	4.0	35–38
910			0.5	0.04	99.4% (FeOOH)	0.1 x 0.6	52	0.3–0.7	4.0	36–39
920	920 C	920 G	0.5	0.04	99.4% (FeOOH)	0.1 x 0.6	60	0.2–0.6	4.0	36–39
930			0.5	0.04	99.4% (FeOOH)	0.2 x 0.8	65	0.4–0.8	4.0	36–39
Combination of: C.I. Pigment Yellow 42 (77492) and C.I. Pigment Red 101 (77491)										
960	965 C	960 G	0.5	0.05	99.3%	0.1 x 0.6	42	0.4–0.8	4.0	33–36
Bayferrox® Brown – Combinations of: C.I. Pigment Red 101 (77491), C.I. Pigment Yellow 42 (77492), C.I. Pigment Black 11 (77499)										
610		610 NG	0.5	0.1	98.7%	0.1–0.2	23	0.7–1.1	4.5	19–21
640			0.5	0.1	98.0%	0.1–0.6	21	0.8–1.2	4.5	15–17
663		663 G	0.5	0.1	97.9%	0.1–0.6	23	0.8–1.2	4.8	12–13
686		686 G	1.2	0.1	96.9%	0.1–0.6	22	0.8–1.2	4.8	11–12
Heat resistant special pigments[4]										
Bayferrox® C.I. Pigment Yellow 119 (77496), Black 33 (77537), Brown 43 (77536)										
950			0.5	0.1	98.8% ($ZnFe_2O_4$)	0.15 x 0.5	18	0.7–1.1	5.2	35–38
303 T			0.7	0.005	77.2% (Fe_3O_4)	0.6	16	1.1–1.5	4.6	22–25
645 T			0.8	0.1	90.1% (Fe_3O_4)	0.3	28	0.6–1.0	4.5	24–26
Colortherm® Green C.I. Pigment Green 17 (77288)										
GN			0.3	0.06	99.0% (Cr_2O_3)	0.3	11	0.8–1.2	5.2	33-36

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LANXESS
Energizing Chemistry

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Health and Safety Information
Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the LANXESS products mentioned in this publication. For materials mentioned which are not LANXESS products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be followed. Before working with any of these products, you must read and become familiar with the available information on their hazards, proper use and handling. This cannot be overemphasized. Information is available in several forms, e.g. safety data sheets, product information and product labels. Consult your LANXESS representative in Germany or contact the Health, Safety, Environment and Quality Department (HSEQ) of LANXESS Germany or - for business in the USA - your LANXESS Corporation representative or contact the Product Safety and Regulatory Affairs Department in Pittsburg, PA.

Regulatory Compliance Information
Some of the end uses of the products described in this publication must comply with applicable regulations, such as the FDA, BfR, NSF, USDA, and CPSC. If you have any questions on the regulatory status of these products, contact – for business in the USA - the LANXESS Corporation Regulatory Affairs and Product Safety Department in Pittsburgh, PA, USA or for business outside US the Health, Safety, Environmental and Quality Department of LANXESS Deutschland GmbH in Germany.

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