

InstantColor[®]

Stains for the Stoneware Industry

Performance Pigments and Colors

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Ferro touches your life every day

Headquartered in Cleveland, Ohio, USA, Ferro Corporation is a world leading producer of Performance Materials, with operations in 20 countries across Europe, Asia, and the Americas.

We apply core technologies in organic and inorganic chemistry to develop leading market positions in a diverse range of industries.

Our mission is "to achieve market leadership through a customer-focused and highly creative organisation committed to delivering top quality products and outstanding services to customers worldwide".

Our materials are used to add value to, and to improve the performance of products in a variety of end markets including building and renovation, home appliances, cookware, giftware and tableware, transportation, household furnishings, leisure, electronics, and industrial products.

We are among the world's leading suppliers of ceramic glazes and colours, glass decoration, precious metal preparations, speciality glasses, porcelain enamel coatings, auxiliary materials, and pigments. We pioneered the development of forehearth colour technology for colouring of glass.

Our global commitment to quality, reliability, innovation, and personal customer care is founded on over 80 years of experience in serving the changing needs of the industry, from our international network of manufacturing plants and service centres. Our commitment to quality management has been recognized with the award of ISO 9000 accreditation to all of our global manufacturing and research facilities.

Meeting the needs of the Colour World calls for great foresight, flexibility, and innovation ...

- Our global presence is a strong competitive advantage. Technical, marketing, and management personnel are in continuous contact with customers in every major region. Multinational customers can be assured of standard products and consistent quality wherever they have operations.
- We co-ordinate our R&D activities globally and use our international talent to ensure that product specifications and performance are designed to satisfy the specific requirements demanded by regional markets.
- Ferro views the growing world-wide concern for the environment as an opportunity to develop improved products and also to participate in Chemical Industry efforts to address public concern. Environmental concerns are a major driving force behind the evolution of our lead- and cadmium-free technology and our low VOC decoration systems.
- The markets we cover are extremely service-intensive. Ferro has established regional colour matching, blending/pasting, and technical support facilities, to provide the level of service demanded by our customers in all time zones.

Think of us as High Performance Partner to manufacturers around the world ...

...Helping to create and enhance many of the products you use and enjoy every day of your life.

InstantColor® for the stoneware industry

A new era in ceramic stains

Pigments and Special Products is a business unit of the Performance Pigments and Colors Division of Ferro. We develop, produce, and market our pigments, special glasses, glazes, and special coating materials.

We are constantly testing new concepts and bringing new products to market, and the strength of our product range lies in its combination of time-tested products and cutting-edge innovations. With a rich heritage of expertise to draw on, we work in partnership with our customers to find creative solutions to their problems and to meet the challenges of changing economic conditions, evolving markets, and increasingly complex legislation.

InstantColor®: reliable, ready-to-use colours

Optimal colour, chroma, and brilliance – all this from a ceramic stain that is so easy to use. Ordinary glaze stains must be ground in a ball mill before mixing. InstantColor® stains consist of uniformly minute particles that are dissolved instantly in the glaze slurry. Extremely fine grains mean far easier dispersibility and more uniform coverage, less production time, and less waste. The InstantColor® stoneware line is a range of breakthrough products that give the stoneware industry the tools it needs to create fashionable fixtures fast and reliably. Innovative, powerful colours can be created from the basic range, while pastel tones can be easily matched.

Quality controls ensure stains meet stoneware requirements

Stains for the stoneware industry must meet specific requirements. Usually they are fired several hours at a temperature > 1200 °C, and must remain true, constant, and specific in colour. It is also advantageous if they are capable of being fired a second time at high temperature without deterioration of colour and surface. This enables a repair or decorating firing for bigger stoneware objects. We ensure that our new products meet these requirements by putting them through rigorous quality checks. All stains are tested at 1250 °C for 13 hours. They are also checked for shade variation, dispersibility, and fineness. Every batch is compared with a colour master, and tested for grain size and sieve residue.

We also guarantee that 99.9 % of InstantColor® grains will be smaller than 32 µm. The only exceptions to this are our inclusion pigments. In every case you can expect uniformly coloured glazes, with no agglomerates to cause ugly spots after firing.

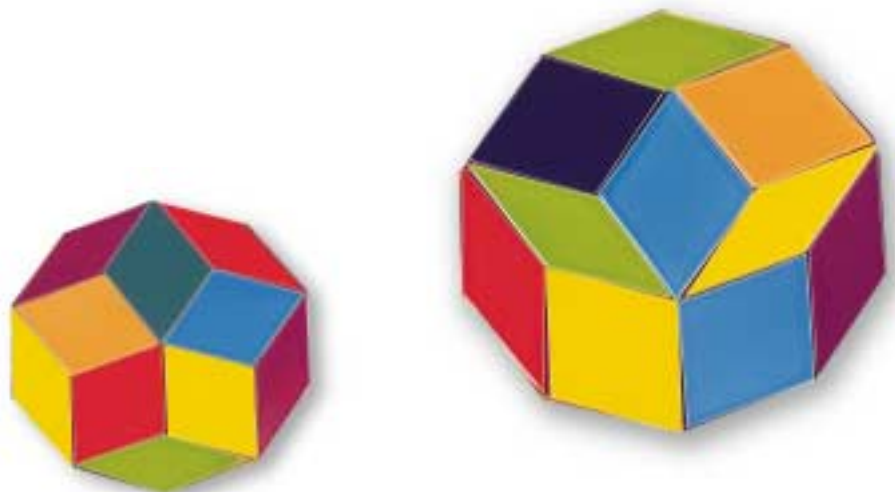


Table 1: InstantColor® stoneware stains composition, firing conditions, and glaze system compatibility

Pigment	System	Colour shade	Crystal structure	Temp. max/°C	Sieve residue (>32 µm)	Firing atmosphere	Glaze compatibility							
							R ₂ O	MgO	CaO	ZnO	PbO	SnO ₂	B ₂ O ₃	ZrO ₂
219 950	Cr-Al	Grass Green	Hematite/Corundum	1400	<0.1 %	ox./red.	x			x				
219 946	Co-Cr-Al	Chrome Green	Spinel	1400	<0.1 %	ox./red.	x			x				
229 942	Zr-V-Si	Turquoise Blue	Zircon	1350	<0.1 %	ox./slightly red.	x				x			3
229 944	Co-Al	Cobalt Blue	Spinel	1450	<0.1 %	ox./red.							3	
229 946 ¹	Co-Si	Cobalt Blue	Olivine	1450	<0.1 %	ox./red.							3	
239 942	Zr-Si-Cd-S-Se	Brilliant Orange	Zircon	1350	<5.0 %	ox.	x		3	3	3			3
239 944	Zr-V	Havana	Baddeleyite	1400	<0.1 %	ox./red.			x	x	x			x
239 946	Zr-Pr-Si	Intense Yellow	Zircon	1250	<0.1 %	ox.	x				x			3
239 947	Zr-Si-Cd-S	Yellow	Zircon	1350	<5.0 %	ox.	x		3	3	3			3
249 942	Co-Cr-Fe-Ni	Black	Spinel	1300	<0.1 %	ox.								
259 943	Sn-Sb-V	Neutral Grey	Rutile/Cassiterite	1300	<0.1 %	ox.								
259 954	Zr-Si-Co-Ni	Zircon Grey	Periclase	1350	<0.1 %	ox./slightly red.				x	x			3
259 959	Zr-Si-Co-Ni	Light Grey	Periclase	1350	<0.1 %	ox./slightly red.				x	x			3
269 946	Zn-Al-Cr-Fe	Biscuit	Spinel	1300	<0.1 %	ox.							3	3
269 952	Zn-Cr-Fe	Wood Brown	Spinel	1300	<0.1 %	ox.							3	3
279 941	Ca-Sn-Si-Cr	Rose	Sphene	1250	<0.1 %	ox.			3	x	3	3		x
279 944	Zr-Si-Cd-S-Se	Intense Red	Zircon	1350	<5.0 %	ox.	x		3	3	3			3
279 946	Zr-Fe-Si	Coral	Zircon	1250	<0.1 %	ox.	x				x			3
279 965 ²	Ca-Sn-Si-Cr	Pink	Sphene	1250	<0.1 %	ox.			3	x	3	3		x
289 942	Sn-Cr	Violet	Rutile/Cassiterite	1250	<0.1 %	ox.			3	x	3	3		x

¹ Hazards identification Xn, R phrases 20/22

² Hazards identification T, R phrases 61-20/22-33

The chemical composition of some stains makes them unsuitable for use in all glaze systems. Such cases are indicated by an (x) in the chart above. Well suitable combinations are marked with (3).

InstantColor® for Stoneware

				
219 950 Grass Green Cr-Al	219 946 Chrome Green Co-Cr-Al	229 942 Turquoise Blue Zr-V-Si	229 944 Cobalt Blue Co-Al	229 946 ¹ Cobalt Blue Co-Si
				
239 942 Brilliant Orange Zr-Si-Cd-S-Se	239 944 Havanna Zr-V	239 946 Intense Yellow Zr-Pr-Si	239 947 Yellow Zr-Si-Cd-S	249 942 Black Co-Cr-Fe-Ni
				
259 943 Neutral Grey Sn-Sb-V	259 954 Zircon Grey Zr-Si-Co-Ni	259 959 Light Grey Zr-Si-Co-Ni	269 946 Biscuit Zn-Al-Cr-Fe	269 952 Wood Brown Zn-Cr-Fe
				
279 941 Rose Ca-Sn-Si-Cr	279 944 Intense Red Zr-Si-Cd-S-Se	279 946 Coral Zr-Fe-Si	279 965 ² Pink Ca-Sn-Si-Cr	289 942 Violet Sn-Cr

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² Hazards identification T, R phrases 61-20/22-33

The glaze composition A to E are listed in table 2.

While every attempt has been made to reproduce colours exactly, the samples printed here may differ slightly from the finished ceramic products.

Each InstantColor® stain must be used according to the parameters stipulated on its accompanying technical data sheet. Please refer to these sheets for full information.

InstantColor®: top stains for tomorrow's world

Brilliant colours:

The 20 basic shades are pure, strikingly bright colours. Deep intensity is combined with a brilliant finish.

Intermixability:

An infinite number of colours can be prepared from the basic range. Colours can be easily adjusted right in the barrel.

Extremely fine, uniform particles:

99.9 % of InstantColor® grains are guaranteed to be smaller than 32 µm.

Easy dispersibility:

Readily dispersed in standard slurries, InstantColor® stains offer flexible handling.

Environmental compatibility:

All InstantColor® Stoneware pigments are leadfree (with the exception of 279 965) and consequently particularly suitable for leadfree glazes. Our sphenes, however, contain only small amounts of lead, so that – even when adding 10 weight-% – the coloured glazes need not to be identified as potentially hazardous. Stains that use cadmium to achieve brilliant reds, oranges, and yellows encapsulate the colour crystals in zirconium silicate, creating totally inert inclusion pigments.

Flawless appearance:

InstantColor® brings a more uniform, flawless surface to opaque glazes.

Flexible production:

Small batches are a snap. Switching from one colour to another is so easy, it makes just-in-time production a reality. No mills to clean, no colour contamination, and no waste.

Cost-effectiveness:

Requiring no capital investment, no mill clean-up time, less water for disposal, and providing high-efficiency intense colours with minimal waste, the InstantColor® range is extremely cost-effective to use.

Help when you need it

The product without the service is only half of what you need. We offer the whole package. Our highly trained development teams, production and engineering staff are backed up by customer service technicians ready to listen to your concerns.

For further information please call our technical service department.

Table 2: Glaze composition

Glaze	A	B	C	D	E
SiO ₂	64.7	61.7	65.3	65.8	60.7
Al ₂ O ₃	13.9	10.9	10.0	11.3	13.1
ZrO ₂	–	8.4	8.1	–	6.0
CaO	10.4	11.8	10.3	10.8	9.8
BaO	3.4	–	1.7	4.2	3.2
ZnO	3.4	–	–	2.2	3.2
K ₂ O	2.2	0.8	2.1	2.1	2.1
Na ₂ O	1.0	4.5	1.6	2.3	0.9
MgO	0.8	1.9	0.9	1.3	0.8
B ₂ O ₃	0.2	–	–	–	0.2

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