
**FULLN GLAZE COMPANY LTD.**

**Tel** +86-757-8393 0904 / 8393 0470
**Fax** +86-757-8393 1410

**Add** NO.22 Mingxi Road, Mingcheng, Gaoming, Foshan, Guangdong, China

**Web** www.fulln.com
**Email** admin@fulln.com


**CN OS**
QR code

**EN OS**
QR code

FULLN® 丰霖釉料
FULLN GLAZE

Our Expertise In Developing Inorganic Pigments Over Two Decades

# Quality Guaranteed and Trustworthy

## About FULLN

Fulln Glaze Co., Ltd. is a highly technological enterprise specializing in environment-friendly inorganic pigments. Our designed inorganic pigments have been used globally in the industries of material coatings, such as on glass, metal, cast iron, plastic, fluorocarbon, enamel and ceramics, as well as for painting dyes. The Fulln company facilities are modernly equipped, and based in the Gaoming district of Foshan City.

Since established, we always aim to pursue excellences in scientific application through normative management, communication, and innovation. These fundamental core values are what we provide for our customers, community and environment.

### Customer priority

We have striengent focuses on customer satisfaction by offering innovative and quality-guaranteed products and reaching customers' requirements with professionalism and fine attention. We aim to develop sustainable relationships with all our partners with persistent product quality and services.

### Respect for people

We treat our employees with respect and recognition, and foster a working atmosphere where people can progress, contribute, and innovate with passion.

### Sustainability

We care our environment by developing earth-green products. We also create a positive community that inspires people to join us to achieve the goals of sustainability.

# Copper Chromite Black

Cu-Cr Black is a highly dark, bluish metal oxide mixtures of blackish pigments, which are produced with varieties of metal oxides through high temperature solid reaction. It exhibits characteristics of high grade of color purity, high temperature resistance, acid and alkaline resistance, solvent resistance, non-migration, easy dispersion, and chemical inertia and stability. Most importantly, it is environment-friendly non-toxic.

Because of their excellent performance, Copper chromite blacks are widely used in all kinds of coatings for exterior wall, building, automobile, and painting for road-signs, water-based paint, UV-resistant paint. The quality meets industrial standards for coating on fluorocarbon, powder, and high temperature-resistance required for color inks, high temperature resistance plastics (such as engineering plastics, masterbatch), building materials, stained glasses, ceramics, enamel, etc.

Other usages: Copper chromite black pigments are environmentally friendly and safe. With the excellence in chemical stability, they are qualified to be used for boilers, enamelware, food packaging and toy industry.

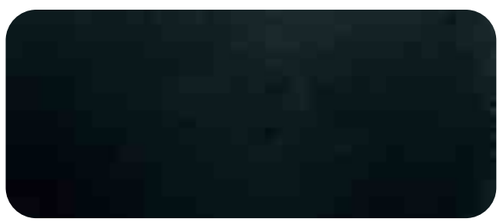
## Technical Indicators

| Technical Indicators | Value | Unit |
|---|---|---|
| Density | 0.75 | $g/cm^3$ |
| Moisture | ≤0.2 | % |
| Averaging Particle Size | 1.68~2.50 | um |
| Electrical Conductivity | <200 | us/cm |
| Oil-absorbing Capacity | 11~25 | g/100g |
| PH Value | 6~9 | |
| Mesh Sieve Residue | ≤0.02 | % |
| Maximum Temperature Tolerance | 800 | ℃ |
| Weather Resistance | 8 | 1~8 |
| Light Fastness | 5 | 1~5 |
| Acid and Alkaline Resistance | 5 | 1~5 |

**Chemical Composition:** Copper oxide/ Chromium oxide
**Appearance of Pigment:** Black powder
**Pigment Crystal Type:** Spinel

## Product Features

**1.** It has excellent chemical and color stability.
**2.** Resistant to high temperature. The formation through high temperature calcination provides a structurally stable substance.
**3.** It exhibits excellent covering ability and weather resistance, and is environmentally safe and non-toxic.



## Product Series and Applications

| Product | Item No. | Applications |
|---|---|---|
| Copper Chromite Black | FU-GS601 | Glass |
| Copper Chromite Black | FU-E693 | Enamel, Glass |
| Copper Chromite Black | FU-C601 | Coating, Plastic |

# Iron Chromite Black

Fe- Cr Black pigment is a black inorganic pigment calcined by the mixtures of iron oxide and chromium oxide. It is an environment-friendly composite inorganic pigment with high thermal stability, corroding resistance and weather resistance. And it has excellent near-infrared reflection performance.

Iron Chromite black is  widely used in all kinds of coatings for exterior wall, building, automobile, and painting for road-signs, water-based paint, UV-resistant paint. The quality meets industrial standards for coating on fluorocarbon, powder, and high temperature-resistance required for color inks, high temperature resistance plastics (such as engineering plastics, masterbatch) ,enamel, etc.

**Chemical Composition:** Fe-Cr
**Appearance of Pigment:** Black powder
**Pigment Crystal Type:** Spinel

## Product Features

**1.** It has excellent chemical and colosrtability.
**2.** Resistant to high temperature. The high temperature calcination processs transforms the substance with structural stablility  structure.
**3.** It has excellent covering ability and weather resistance, and is cost-effective.

## Technical Indicators

| Technical Indicators | Value | Unit |
|---|---|---|
| Density | ≤0.2 | % |
| Moisture | 2.5 | um |
| Averaging particle size | <200 | us/cm |
| Averaging particle size | 11~20 | g/100g |
| PH Value | 6~9 | |
| Mesh Sieve Residue | ≤0.02 | % |
| Max Temperature | 1000 | ℃ |
| Weather Resistance | 7~8 | 1~8 |
| Acid and Alkaline Resistance | 5 | 1~5 |

## Product Series and Applications

| Product | Item No. | Applications |
|---|---|---|
| Iron Chromite Black | FU-C603 | Coating, Plastic |
| Iron Chromite Black | FU-E683 | Enamel |









# Cobalt Black

FULLN GLAZE ceramic glaze pigment Cobalt Black is a black inorganic pigment sourced from raw materials such as cobalt oxide, nickel oxide, iron red and chrome green through calcination and micropowder processing. During the high-temperature calcination process, Co2+, Co3+, Ni2+, Fe2+, Fe3+ and Cr3+ ions evenly diffuse to form materials with spinel structure.

This series of products have excellent temperature resistance and color-exhibiting performance. It has a very low electrical conductivity and has been assured of minimal existence of soluble salt contents in the coloring. Cobalt Black is suitable for various types of tableware products.

**Chemical Composition:** Co-Ni-Fe-Cr
**Appearance of Pigment:** Black powder
**Pigment crystal Type:** Spinel

## Product Features

**1.** It has excellent chemical and color stability.
**2.** Resistant to high temperature. The high temperature calcination process provides a substance with structural stability.
**3.** It has excellent covering ability and weather resistance. And it's environmentally friendly and non-toxic.

## Technical Indicators

| Product | Item No. | Chemical composition | Colour | Conditions of Use | | | Physical Properties | |
|---|---|---|---|---|---|---|---|---|
| | | | | Firing Temperature | Firing Atmosphere | Basic Glaze | Moisture | Fineness |
| COBALT BLACK | FU-6003 | Co-Ni-Fe-Cr | | 1300℃ | Oxidizing atmosphere | Transparent and matte | ≤0.3 | 400 mesh all pass |
| COBALT BLACK | FU-6403 | Co-Ni-Fe-Cr | | 1300℃ | Oxidizing atmosphere | Transparent and matte | ≤0.3 | 400 mesh all pass |
| COBALT BLACK | FU-6503 | Co-Ni-Fe-Cr | | 1300℃ | Oxidizing atmosphere | Transparent and matte | ≤0.3 | 400 mesh all pass |

# Painting Application

The series of products are specifically developed for the coatings as inorganic pigments, which are composed of several metal oxides. The  products are more above simple composites, as through high temperature solid-phase reaction. The metal ions are thermally diffused into the lattice of within the fundamental crystal. And thus partially replaces the basic cations in the lattice and turn the material as a new substance. The transformed pigments have excellent weather resistance, heat resistance, light resistance and chemical resistance. They are compatible with most coatings, especially suitable for outdoor coatings requiring high chemical resistance.

## Technical Indicators

| Name | Item No. | Color | Physical Properties | | | | | | Chemical Resistance | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Average iameter (um) | PH Value | Oil Absorption g/100g | Moisture % | 400 Mesh Sieve Residure | Electrical Conductivity | Heat Resistance | Weather Resistance | Light Fastness | Acid and Alkali Resistance |
| | | | | | | | | us/cm | (℃) | (1-8) | (1-5) | (1-5) |
| Copper Chromite Black | FU-C601 | | 1.68 | 6~9 | 15~25 | ≤0.2 | ≤0.02 | ≤200 | 800℃ | 8 | 5 | 5 |
| Iron Chromite Black | FU-C603 | | 2.5 | 6~9 | 11~20 | ≤0.2 | ≤0.02 | ≤200 | 1000℃ | 7-8 | 5 | 5 |
| Titanium Nickel Yellow | FU-C211 | | 2.5 | 6~9 | 11~17 | ≤0.2 | ≤0.02 | ≤200 | 1000℃ | 7-8 | 5 | 5 |
| Titanium Chromite Yellow | FU-C251 | | 2.5 | 6~9 | 11~17 | ≤0.2 | ≤0.02 | ≤200 | 1000℃ | 7-8 | 5 | 5 |
| Cobalt Blue | FU-C574 | | 3.5 | 6~9 | 25~35 | ≤0.2 | ≤0.02 | ≤200 | 1200℃ | 7-8 | 5 | 5 |
| Cobalt Chromite Blue | FU-C411 | | 2.5 | 6~9 | 16~25 | ≤0.2 | ≤0.02 | ≤200 | 1200℃ | 7-8 | 5 | 5 |
| Cobalt Titanium Green | FU-C400 | | 2.5 | 6~9 | 11~20 | ≤0.2 | ≤0.02 | ≤200 | 1000℃ | 7-8 | 5 | 5 |
| Iron Chromite Brown | FU-C232 | | 2.5 | 6~9 | 16~25 | ≤0.2 | ≤0.02 | ≤200 | 1200℃ | 7-8 | 5 | 5 |
| Zinc Iron Yellow | FU-C252 | | 2.5 | 6~9 | 11~17 | ≤0.2 | ≤0.02 | ≤200 | 800 | 7-8 | 5 | 5 |

# Glass Application

The series of products are suitable for glass surface decoration.They are glass ink coloring agents, with good coloring ability, homogenous dispersion and excellent covering ability, thus providing wide ranges of color options for glass decoration. The glass-coloring pigments need to be coupled with low temperature flux, which can be be high boron frit powder or leaded frit powder, and to be carried out at 500-800℃ . The fineness of low temperature flux is less than 1250 mesh. The ratio of glass color and low temperature flux is between (1~3)-(7~9), depending on customer's requirements.

## Technical Indicators

| Name | Item No. | Color | Technical Indicators | | | | |
|---|---|---|---|---|---|---|---|
| | | | Chemical composition | Max. Temperature | Oil Absorption g/100g | Moisture % | 400 Mesh Sieve Residure |
| Cd Red | FU-GS128 | | Cd-Se-S | 750℃ | 10-20 | ≤0.5 | ≤0.05 |
| Red | FU-GS178 | | Cd-Se-S | 750℃ | 10-20 | ≤0.5 | ≤0.05 |
| Cd Yellow | FU-GS208 | | Cd-S | 750℃ | 10-20 | ≤0.5 | ≤0.05 |
| Lemon Yellow | FU-GS280 | | Cd-S-Zn | 750℃ | 10-20 | ≤0.5 | ≤0..05 |
| Golden Brown | FU-GS261 | | Fe-Cr-Al-Zn | 1000℃ | 15-22 | ≤0.5 | ≤0.05 |
| Red Brown | FU-GS232 | | Fe-Cr-Zn | 1000℃ | 15-22 | ≤0.2 | ≤0.05 |
| Coffee Brown | FU-GS273 | | Fe-Cr-Al | 1000℃ | 15-22 | ≤0.5 | ≤0.05 |
| Orange Yellow | FU-GS351 | | Ti-Cr-Sb | 1000℃ | 11-20 | ≤0.3 | ≤0.05 |
| Chrome Green | FU-GS405 | | Cr-O | 1000℃ | 11-20 | ≤0.3 | ≤0.05 |
| Cobalt Green | FU-GS416 | | Co-Ti | 750℃ | 11-20 | ≤0.3 | ≤0.05 |
| Peacock Green | FU-GS411 | | Co-Cr-Al-Zn | 1000℃ | 11-22 | ≤0.2 | ≤0.05 |
| Sky Blue | FU-GS512 | | Co-Cr-Al | 1000℃ | 11-22 | ≤0.2 | ≤0.05 |
| Mytle Blue | FU-GS541 | | Co-Cr-Al-Zn | 1000℃ | 11-22 | ≤0.2 | ≤0.05 |
| Cobalt Blue | FU-GS584 | | Co-Al | 1000℃ | 11-22 | ≤0.2 | ≤0.05 |
| Copper Chromite Black | FU-GS601 | | Cu-Cr | 750℃ | 15-25 | ≤0.2 | ≤0.05 |
| Copper Chromite Black | FU-GS602 | | Cu-Cr | 750℃ | 15-25 | ≤0.2 | ≤0.05 |
| White | FU-GS100 | | Ti-O | 750℃ | 11-20 | ≤0.2 | ≤0.05 |


# Enamel Application

The series of products are specifically developed for the enameled products. We choose environment-friendly raw materials, with stringent control in fineness, moisture, coloring, dispersion and other parameters of pigment products, so to assure excellent coloring performance and chemical stability in individual product batches. Our enamel colors include black, red, yellow, blue, purple, green, etc., and the techinical team can further provide more varieties of color panels according to customers' requirements.

## Technical Indicators

| Name | Item No. | Color | Technical Indicators | | | |
|---|---|---|---|---|---|---|
| | | | Chemical composition | Max. Temperature | Moisture % | 400 Mesh Sieve Residure |
| Cd Red | FU-E108 | | Cd-Se-S | 900℃ | ≤0.5 | ≤0.10 |
| Orange | FU-E228 | | Cd-Se-S | 900℃ | ≤0.5 | ≤0.10 |
| Cd Yellow | FU-E208 | | Cd-S | 900℃ | ≤0.5 | ≤0.10 |
| Yellow | FU-E330 | | Ti-Cr-Sb | 900℃ | ≤0.5 | ≤0.10 |
| Maroon | FU-E146 | | Sn-Cr-Ca-Si | 1200℃ | ≤0.3 | ≤0.30 |
| Red Brown | FU-E232 | | Zn-Fe-Cr | 1200℃ | ≤0.3 | ≤0.05 |
| Coffee Brown | FU-E242 | | Fe-Cr-Al | 900℃ | ≤0.3 | ≤0.10 |
| Peacock Green | FU-E401 | | Co-Cr-Al-Zn | 1200℃ | ≤0.3 | ≤0.05 |
| Chrome Green | FU-E405 | | Cr-O | 1200℃ | ≤0.3 | ≤0.05 |
| Green | FU-E412 | | Cr-Al | 1200℃ | ≤0.3 | ≤0.05 |
| Blue | FU-E513 | | Co-Si | 1200℃ | ≤0.3 | ≤0.05 |
| Sky Blue | FU-E523 | | Co-Cr-Al | 1200℃ | ≤0.3 | ≤0.05 |
| Cobalt Blue | FU-E584 | | Co-Al-Zn | 1200℃ | ≤0.3 | ≤0.05 |
| Mytle Blue | FU-E512 | | Co-Cr-Al-Zn | 1200℃ | ≤0.3 | ≤0.05 |
| Turquoise Blue | FU-E561 | | V-Si-Zr | 1200℃ | ≤0.3 | ≤0.05 |
| Cobalt Black | FU-E653 | | Cr-Co-Fe-Cu | 1200℃ | ≤0.3 | ≤0.05 |
| Black | FU-E683 | | Fe-Cr | 900℃ | ≤0.3 | ≤0.05 |
| Copper Chromite Black | FU-E693 | | Cu-Cr | 900℃ | ≤0.3 | ≤0.05 |
| Gray | FU-E752 | | Co-Fe-Cr-Zr-Si | 1000℃ | ≤0.3 | ≤0.10 |