



Version: 04. Feb. 2009

**Unleaded Resistant Colours
for Porcelain Range "BF"**
Firing Range 820 – 860°C

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General information

The series „BF“ is a palette of unleaded, resistant onglaze colours for Bone China, earthenware, porcelain, enamel and tiles.

It consists of 24 basic colours and the mixing flux BF 9184.

The colours are almost universally intermixable among each other, so that nearly all desired tints can be adjusted, and there is no need for maintaining a big colour stock.

The colours are manufactured without using lead compounds. Lead residues, analytically detectable, result from impurities of raw material as well as from deposits occurring during production.

Resistance

The colours are resistant according to DIN 51031/ 32

Coefficient of thermal extension: $20 - 40^{\circ} \text{C} / 75 \square 85 \times 10^{-7}$

Miscibility

The colours of the palette „BF“ are mostly intermixable among each other.

The purple colours (containing precious metals)

BP 520
BP 540
BP 541
BP 7196
BP 7197

should be intermixed among themselves only and not with other colours.

Mixing with white and blue colour is possible

We recommend as a white mixing colour: BF 9183, for the purpose of a strong brightening effect BF 9181, and as a flux additive: BF 9184.

Processing

All colours have good processing properties for the different decorating techniques because of their range of uniform and fine particle sizes.

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They are suitable for direct and for indirect screen process printing as well as for application by brush, for lining and for spraying.

The utmost permitted layer thickness depends on the glazing heat and firing temperature and ranges between 20 □ 30 µm. On porcelain the maximum layer thickness is limited – the application of several layers or one thick layer of colour is not possible and may cause cracking or flaking off.

Decorating leaded glazes with unleaded colours might lead to the result, that the release values of lead of the decoration will increase dramatically.

Firing

The colours of the palette „BF“ are fired on earthenware, Bone China and hard paste porcelain each according to glaze and firing on conditions between 800 ° to 850 ° C.

Porcelain: 820 – 850 ° C / 60 – 90 minutes, best:
830 ° C / 60 min. / 10 min. peak time

Bone China: 800 – 840 ° C / 60 – 90 minutes

Enamel: 830 – 860 ° C / 1 – 2 minutes

"BF" colours are suitable for all common applications and offer best processing caused by their narrow particle size distribution.

To achieve best process results during direct and indirect printing colour paste must be homogenized by using a three roller mill.

Layer thickness and colour shade of ceramic colours are depending from different factors as e.g. screen thickness, preparing of the pattern onto screen, shore hardness and angel of the squeegee, formulation of the colour etc.

The figures we provide in the following pages should give you a rough estimation and every user had to make test under their own conditions.

In each case you have to adjust the firing temperature, object temperature and firing cycle to the items to be decorated and to the type of kiln.

In the temperature up to about 450 ° C – in which organic media and covercoats decompose – the kiln should exhaust very effective. A fast increase of temperature, short peak time and a slow cooling down is advantageous to the items.

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The following decorating auxiliaries can be used:

Direct Screen Print Process:

a)

0405 silk screen printing medium, oily

Ratio of pasting:

Colour powder: 55 – 65 weight units

Printing oil: 45 – 35 weight units

b)

0509 silk screen printing medium, compatible with water

Ratio of pasting:

Colour powder: 55 – 65 weight units

Printing oil: 45 – 35 weight units

Recommended screen:

Polyester: 77 – 140 threads/ cm

Steel: 220 – 300 mesh

according to decoration and colour

Indirect Screen Print Process (Decals):

a)

0465 Screen printing oil for transfers (decals)

for manual and semi automatically screen printing

b)

0782 and 0782 thix Screen printing oil for transfers, fluid or thixotropic

for fully automatically screen printing

Ratio of pasting:

Colour powder: 50 – 60 weight units

Oil: 50 – 40 weight units

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Recommended screen:

Polyester: 90 – 145 threads/ cm

Steel VA: 230 – 370 mesh

depending on decoration and colour

Covercoats:

a)

0433 Covercoat

for manual or semi automatically screen printing

b)

0601 or 0601 thix Covercoat

for fully automatical screen printing

c)

0506 Antiblock covercoat

Recommended screen:

Polyester 30 threads/ cm

Brush Application:

a)

Turpentine oil and 0000/3 Dammarcoat or 21 New Bodied oil

Mixed with medium 0405, oily to adjust viscosity

b)

0509 Screen printing medium, compatible with water

Dilution with water to adjust viscosity

c)

Paste for screen process printing (based on oil 0405)

to be thinned with turpentine oil until paintable consistency is achieved

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Lining:

0513 Lining medium, compatible with water

Orientation recipe:

Colour: 100 g
Oil 0513: 32 g
Water: 60 g

Spraying:

0000/2 Spraying oil

To be ground finely, for instance in a ball mill

For preparing oily preparations, the colour powder has to be completely dry. Even little moisture having been attracted during storage, will lead to „cheesy“ pastes, which can no longer be processed perfectly. Therefore we recommend to dry the colour powder at 120 ° C before preparing them.

Security Advices

Because ceramic colours are chemical products, for processing them you have to consider specific security advices.

While processing, it is most important to obey the hygienic precautions such as:

- ☐ Do not eat, drink or smoke while being at work.
- ☐ Do not inhale dust.
- ☐ Keep it away from food stuff, beverage and fodder.
- ☐ In case of contact with skin: Wash off and rinse with water and soap.
- ☐ If having inhaled: Rinse mouth with cold water.

For more information please contact us or ask for a Material Safety Data Sheet. (MSDS).

Forms of Delivery

Powder: Minimum purchase quantity per colour shade: 5 kg
Pastes for screen printing: Minimum purchase quantity per colour shade: 5 kg

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Storage

Colour powder has unlimited durability, if stored in dry condition.

The powders are a little bit of water attracting (hygroscopic).

Before being processed with oily media, they should by all means be dried at a temperature of about 120°C, because a content of little more than 0,1 % water will lead to „cheesy“ pastes. In this case they can no longer be perfectly printed, because they become thick.

Please take care to disperse the colour powder with the medium homogenously. In mixing the powder with the medium, small colour lumps will still remain. Therefore please use a three roll mill or dissolver.

Even in closed vessels the pastes for screen process printing have only a limited shelf life. We advice you to store the pastes under cool and dry conditions.

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