



Version: 1.9. 2013

**Unleaded Resistant Colours
for Porcelain Range "BA"**
Firing Range 820 – 900°C

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General information

The series „BA“ is a palette of unleaded, resistant onglaze colours for Bone China, earthenware, porcelain, enamel and tiles. This series shows an excellent durability against the attack of acidic and alkaline media. Correct processing results in a very good dishwasher durability.

Miscibility:

Besides the basic colours the series contains the mixing and coating fluxes BA 9277 und BA 9252. BA 9252 is especially suitable for Cadmium Colours. The colours are almost universally intermixable among each other, so that nearly all desired tints can be adjusted. Purple colours should only be mixed among themselves, but not with most other colours. Mixing of the purples with white and blue are possible. As mixing white BA 9581 (Tin White) is recommended. For the colour shades of the basic colours please look at the colour chart

Heavy Metals Content and -Release:

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.

The Colours contain less than 600 ppm Lead. The intense red and yellow colours contain Cadmium. When processed and fired correctly the colours fulfil the regulations regarding heavy metals release, like:

DIN 51031/32, EN 1388 1-2, FDA and California Prop. 65.

Processing:

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

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

Please Note:

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The utmost permitted layer thickness depends on the glazing heat and firing temperature and ranges between 20 - 30 µm. The colours are also suitable for porcelain, because even with a double print with a 77 T screen they are not flaking off.

It should however be avoided to print more than 3 layers of colour on top of each other – this can lead to cracking and flaking off.

The coefficient of thermal expansion is $65 - 70 \times 10^{-7} (20 - 400^\circ\text{C})$

Firing

The colours of the palette „BA“ are fired on earthenware, Bone China and porcelain each according to glaze and firing-on conditions between 800 ° to 900 ° C.

Porcelain: 820 – 850 ° C / 90 – 120 minute cycle or
900 ° C / 30 - 60 min. fast fire cycle

Bone China: 800 – 900 ° C / 60 – 120 minutes

Enamel: 800 – 860 ° C / 1 – 2 minutes

“BA” 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 has to make tests under his 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 range 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.

Decoration and Application:

The following decorating auxiliaries can be used:

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Direct Screen Print Process:

a)

0405 silk-screen printing medium, oily

Ratio of pasting:

Colour powder: 100 weight parts

Printing oil: 40 - 60 weight parts

b)

0551 silk-screen printing medium, compatible with water

Ratio of pasting:

Colour powder: 100 weight parts

Printing oil: 50 - 60 weight parts

Recommended screen:

Polyester: 77 – 140 threads/ cm

Steel: 220 – 300 mesh

according to decoration and colour

Indirect Screen Print Process (Decals):

a)

00721 and 0721 thix Screen printing Medium for decals, fluid or thixotropic

b)

0782 and 0782 thix Screen printing Medium for decals, fluid or thixotropic

Ratio of pasting:

Colour powder: 100 weight parts

Oil: 50 – 70 weight parts

Recommended screens:

Polyester: 90 – 145 threads/ cm

Steel VA: 230 – 370 mesh

depending on decoration and colour

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Covercoats:

a)

0601 or 0601 thix Covercoat

for fully automatical screen printing

b)

0693 Antiblock covercoat

Recommended screen:

Polyester 24 - 32 threads/ cm

Brush Application:

a)

Turpentine oil and 0000/3 Dammar Laquer
mixed with medium 0405, oily to adjust viscosity

b)

0509 Screen printing medium, compatible with water
Dilution with alcohol (Fast drying) or thinner 0561 (slow drying) to adjust viscosity

c)

Screen process printing oil 0405, to be thinned with turpentine oil until paintable
consistency is achieved

Lining:

0513 Lining medium, compatible with water

Orientation recipe:

Colour powder:	100 g
Medium 0513:	30 g
Water or alcohol	60 g

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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).

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 roller mill or dissolver.

Even in closed vessels the pastes for screen process printing have only a limited shelf-life. We recommend storage of the pastes under cool and dry conditions.

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