



<b>Version: 01.Mar.2008</b>	<b>Inglaze Colours "ES" High- Fire Palette "AS" and "AH"</b> Firing Temperature: 1220 – 1260°C Fast Firing 60 – 90 Min. AS 1300 – 1400°C AH 1280 – 1350°C	<b>Page:</b>  1/8
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### General information

During the firing process the colours of palette "ES" sink into the surface of the glaze; due to this they are highly dish washer resistant, and resistant to acids and to abrasion.

Due to the good processing properties, it can be decorated with them by all common application processes.

For the decoration on tiles „ES“-colours can be used as onglaze colours in the firing range of 980 – 1080 ° C. When decorating them under glazes, the firing range will be 1050 – 1180 ° C.

Also pottery and sanitary ceramic you can decorate with these colours.

The colours indicated with \* you can find on our sample plate „ES-colours“.

### Resistance

#### Dishwasher-Resistance

After more than 1000 rinsing runs in a household dishwasher, in using a customary in trade detergent, the colours did not show a discernible attack.

#### Resistance to Acids

All colours got through a test with a 3 % hydrochloric acid, lasting for 5 hours, without a visible change.

#### Release of Lead and Cadmium

The investigation of the colours was effected according to DIN 51031/32 (4 % acetic acid at + 22 / - 2 ° C during 24 hours).

The release of heavy metal was under the detection limit of the spectrophotometer of atomic absorption (ASS).

The colours of palette „AS“ and „AH“ have a wide firing range and sink into the glaze during firing.

They are absolutely resistant to acids and alkalis and to mechanical dish washing and abrasion.

#### **Please Note:**

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„AS“ colours are lead-free.

„AS“ and „AH“-colours can also be applied as UNDER-GLAZE colours.

Because of their high concentration of staining pigments they are suitable for colouring glazes and masses.

They offer good processing properties and can be applied as decorations by all application procedures.

### Miscibility

The colours of the series „ES“ are largely intermiscible among each other; thus the palette is essentially enlarged.

The four purple colours (containing precious metal)

PH 7133  
PH 7134  
PH 7135  
PH 7185

should only be intermixed among each other and also not with the other colours.

Tinting admixtures with White are possible.

As an Admixing White for all colours „ES“ we recommend F 9151/ S.

As a flux additive for brightening FL 9150 is suitable for all colours.

The „ES“ colours normally burn out with a high-lustrous finish.

If you want to achieve matt decorations, you may intermix the colours with Matt Additive ES 9172.

Depending on the desired matting effect, the addition of 20 – 40 % Matt Additive is required, for example:

Colour powder:	60 weight units
ES 9172:	40 weight units

By admixing matt additive the sink-in effect will be a little reduced, and the colour shade will appear brighter for about 50 %.

The very colour-intense cobalt-blue hard-fire colours tend to „running out“.

This effect intensifies with increasing layer thickness and firing temperature.

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Some types of colours tend to appearances of supersaturating (matt surfaces after firing-on), if colour layers are applied excessively thick.

With stronger glazed parts possessing a better absorbency of colour pigments those inadequate effects do not arise.

The following decorating auxiliary agents are suitable:

**Brush  
Application:**

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

0405 Screen printing medium, oily

(is here used as painting oil)

addition according to the need

b)  
Screen printing paste (based on 0405)

to be diluted with turpentine oil to consistency for painting

addition according to the need

c)  
0509 Screen printing oil, compatible with water

Pasting ratio:

Colour powder: 65 – 70 weight units

Oil: 35 – 30 weight units

to be thinned with water

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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

**Preparation:**

Colour powder: 55 – 65 weight units  
Spraying oil: 45 – 35 weight units

To be ground finely, for instance in a ball mill  
For preparing oily preparations, the colour powder has to be completely dry.  
Even little moistness – circumstances permitting – having been attracted during storage, will lead to „cheesy“ pastes, which can no longer be processed perfectly. Thus we recommend to dry the colour powders at 120 ° C before preparing.

**Direct Screen  
Process:**

a)  
0405 Screen printing medium, oily

Ratio of pasting:

Colour powder: 65 – 75 weight units  
Printing oil: 35 – 25 weight units

b)  
0509 Screen printing medium, compatible with water

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Ratio of pasting:

Colour powder: 65 – 75 weight units

Printing oil: 35 – 25 weight units

Straining cloth of silk-screen:

Polyester or nylon: 77 – 145 threads/ cm

Steel: 230 – 370 mesh

according to decoration and colour

Indirect Screen  
Printing:  
(decals)

a)

0465 Screen printing oil for transfers

for manual and semi-automatically screen process  
printing

b)

0465/4 Screen printing oil for transfers

for fully automatically screen process printing

Ratio of pasting:

Colour powder: 55 – 65 weight units

Oil: 45 – 35 weight units

Straining cloth of silk-screen:

Polyester or nylon: 90 – 145 threads/ cm

Steel VA: 230 – 370 mesh

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according to decoration and colour

Covercoat:

a)

0433 Covercoat

for manual or semi-automatically screen process printing

b)

0433/ 4 Covercoat

for fully automatically screen process printing

c)

0506 Antiblock covercoat

Straining cloth of silk-screen:

Polyester or nylon 30 threads/ cm

#### **Etch Imitation ES 9164 for gold coverings:**

In contrary to the other colours of the palette „ES“ Etch Imitation ES 9164 does not sink into the surface of the glaze, but remains standing to the thickness of its applied layer. For decorating further white brilliant patterns on Etch Imitation, we recommend White ES 9162.

As a PM decoration in a second firewe recommend Bright Gold BGS 6107 10 % ; here the firing temperature should be about 800 ° C.

After firing the places, in which the Gold will get to set on the Etch Imitation, will appear matt.

However, on those places, on which the White is printed over the Etch Imitation, the precious metal preparation will retain its gloss.

In powder form the Etch Imitation ES 9164 looks completely like white.

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After fast firing – being usual for most of the gold underlay - it gets a light yellow colouring.

### Firing

The colours of palette „ES“ can be fired at temperatures of 1220 – 1260 ° C.

Best temperature on HARD PORCELAIN is at 1240 ° C / 60 – 90 min.

Orientation values for AS and AH:

„AS“: 1300 – 1400 ° C  
„AH“ 1280 – 1350 ° C

On SOFT GLAZES the firing-on temperature can be adjusted accordingly lower.

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 medias 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 substrates.

### Security Advices

As ceramic colours are chemical products, for processing them you have to consider specific security advices according to the danger substance decree.

The informing stickers give notice about the respective dangers .

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).

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### Forms of Delivery

Colour powder:	Minimum purchase quantity per colour shade:	5 kg
Screen printing paste:	Minimum purchase quantity per colour shade:	5 kg

### Storage

Colour powder grants the advantage of unlimited durability, if stored in dry condition. The powders are a little bit 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 % moistness 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 receptacles the colours pasted with screen printing oil have only a limited shelf-life. We advice you to store the pastes in a cool environment.

### Colour Samples

For the purpose of tests please request a sample collection from us.

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