



## Acid Etch Imitation for Porcelain and Glass (Two-Fire Decal Method)

### 1 General Information

With the following procedure decorations can be produced which are visually similar to acid etching. Imitation acid etch decals can be used on porcelain and glass. Depending on the object to be decorated and the firing range, different underlays, precious metal preparations and screens have to be used.

### 2 Processing

#### 2.1 Porcelain – Onglaze (Firing Range 830-850°C / 1470-1530°F), containing lead

Mixing the matt underlay paste.

It is recommended to mix 100 parts by weight of Heraeus matt underlay H 4305a or H 4305b (contains silver) with 60 parts by weight of screen printing medium Nr. 221. To achieve particular gold colours after firing it is also possible to mix both matt underlays in a ratio of 1:1.

Homogenize the paste with a triple roll mill. This is of particular importance as a matt or rough colour surface is usually caused by insufficient dispersion of the colour powder. Consistent use of the triple roll mill can help to avoid these faults.

- Print the matt underlay with a 130-34 to 165-27 polyester screen.
- Leave to dry.
- Mix the bright relief H 44000 in the same way as the matt underlay using 100 parts by weight of the colour to 50 parts by weight of screen printing medium Nr. 221.
- Print the relief design with bright relief H 44000 using a 68-55 polyester screen or a 180-220 mesh steel screen.
- Leave to dry.
- After the relief design has dried the print can be covered with the covercoat L 406. A 32-120 polyester screen is best suited to print the covercoat.
- Transfer the decal onto the object to be decorated.
- Fire the imitation design at 830-850°C / 1470-1530°F (first fire).
- Apply the liquid precious metal preparation onto the matt relief.
- The precious metal preparation is then fired in the second fire at 750-760°C / 1380-1400°F. The second fire must be at a lower temperature otherwise the precious metal preparation will crack on the relief. Fine line or flat designs are less likely to crack as opposed to thick relief layers or reliefs with a large surface area. It is recommended to carry out test firings to find the optimum individual firing temperatures and conditions.

The statements concerning our products correspond to our current knowledge and experience. It is the obligation of the purchaser to examine the usefulness of the products in its intended use in each individual case. In order to prevent production losses the user has to test the preparations in connection with every other material being involved in the production process and has to be satisfied that the intended result can be consistently produced.

## 2.2 Porcelain – Onglaze (Firing Range 830-850°C / 1470-1530°F), lead free

- Mixing the matt underlay:

It is recommended to mix 100 parts by weight of Heraeus matt underlay H 55301 or H 55302 with 60 parts by weight of screen printing medium Nr. 221. To achieve particular gold colours after firing it is also possible to mix both matt underlays in a ratio of 1:1.

Homogenize the paste with a triple roll mill. This is of particular importance as a matt or rough colour surface is usually caused by insufficient dispersion of the colour powder. Consistent use of the triple roll mill can help to avoid these faults.

- Print the matt underlay with a 130-34 to 165-27 polyester screen.
- Leave to dry.
- Mix the lead free bright relief H 54002 in the same way as the matt underlay using 100 parts by weight of the colour to 60 - 70 parts by weight of screen printing medium Nr. 221.
- Print the relief design with bright relief H 54002 using a 180 mesh steel screen.
- Leave to dry.
- After the relief design has dried the print can be covered with the covercoat L 406. A 32-120 polyester screen is best suited to print the covercoat.
- Transfer the decal onto the object to be decorated.
- Fire the imitation design at 830-850°C / 1470-1530°F (first fire).
- Apply the liquid precious metal preparation onto the matt relief.
- The precious metal preparation is then fired in the second fire at 750-760°C / 1380-1400°F. The second fire must be at a lower temperature otherwise the precious metal preparation will crack on the relief. Fine line or flat designs are less likely to crack as opposed to thick relief layers or reliefs with a large surface area. It is recommended to carry out test firings to find the optimum individual firing temperatures and conditions.

## 2.3 Porcelain – Fast Firing (Firing Range 1200-1230°C / 2190 - 2250°F)

- Mixing the matt underlay:

It is recommended to mix 100 parts by weight of Heraeus matt underlay H 8000 or H 8002 with 60 parts by weight of screen printing medium Nr. 221. Homogenize the paste with a triple roll mill.

- Print the matt underlay with a 100-40 polyester screen.
- Leave to dry.
- Mix the bright relief H 8008 in the same way as the matt underlay using 100 parts by weight of the colour to 50 parts by weight of screen printing medium. Always use the same screen printing medium as with the matt underlay.
- Print the relief design with bright relief H 8008 using a 180-220 mesh steel screen.
- Leave to dry.
- After the relief design has dried the print can be covered with the covercoat L 406. A 32-120 polyester screen is best suited to print the covercoat.
- Transfer the decal onto the object to be decorated.
- Fire the imitation design at 1200-1230°C / 2190 - 2250°F (first fire).
- Apply the liquid precious metal preparation onto the matt relief.
- The precious metal preparation is then fired in the second fire at 800-810°C / 1470-1490°F. With this system a higher firing temperature can be chosen, as the precious metal preparation does not crack on the relief fired at the higher first-fire temperature.

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## 2.4 Glass (Firing Range 540-580°C / 1000-1075°F), containing lead

- Mixing the matt underlay:

It is recommended to mix 100 parts by weight of Heraeus matt underlay H 01003 with 60 parts by weight of screen printing medium Nr. 221. Homogenize the paste with a triple roll mill.

- Print the matt underlay with a 130-34 to 165-27 polyester screen.
- Leave to dry.
- Mix the bright relief H 31005 in the same way as the matt underlay using 100 parts by weight of the colour to 50 parts by weight of screen printing medium Nr. 221.
- Print the relief design with bright relief H 31005 using a 68-55 polyester screen or a 180-220 mesh steel screen.
- Leave to dry.
- After the relief design has dried the print can be covered with the covercoat L 406. A 32-120 polyester screen is best suited to print the covercoat.
- Transfer the decal onto the object to be decorated.
- Fire the imitation design at 560-580°C / 1040-1080°F (first fire).
- Apply the liquid precious metal preparation onto the matt relief.
- The precious metal preparation is then fired in the second fire at a lower temperature of approx. 500°C / 930°F to avoid cracking.

## 2.5 Glass (Firing Range 540-580°C / 1000-1075°F), lead free

- Mixing the matt underlay:

It is recommended to mix 100 parts by weight of Heraeus matt underlay H 52004 with 80 parts by weight of screen printing medium Nr. 221. Homogenize the paste with a triple roll mill.

- Print the matt underlay with a 130-34 to 165-27 polyester screen.
- Leave to dry.
- Mix the bright relief H 50201 in the same way as the matt underlay using 100 parts by weight of the colour to 50 parts by weight of screen printing medium Nr. 221.
- Print the relief design with bright relief H 50201 using a 68-55 polyester screen or a 180-220 mesh steel screen.
- Leave to dry.
- After the relief design has dried the print can be covered with the covercoat L 406. A 32-120 polyester screen is best suited to print the covercoat.
- Transfer the decal onto the object to be decorated.
- Fire the imitation design at 560-580°C / 1040-1080°F (first fire).
- Apply the liquid precious metal preparation onto the matt relief.
- The precious metal preparation is then fired in the second fire at a lower temperature of approx. 480-500°C / 866-930°F to avoid cracking.

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