

## 32286 Relief white 760–860°C

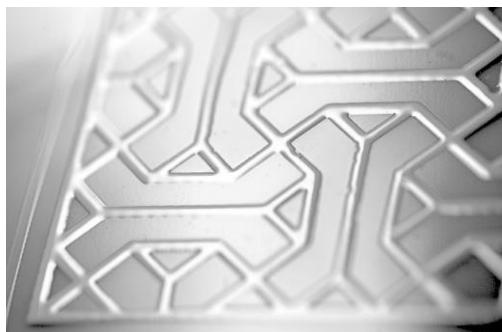
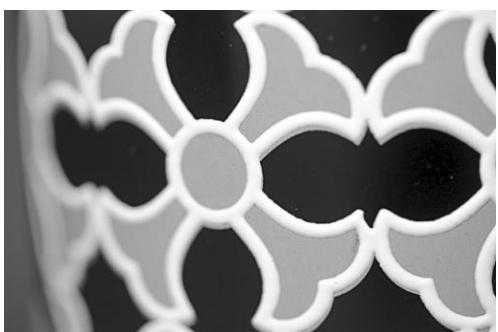
Resistant– low lead release onglaze relief white

### 1. General Information

32286 is resistant, low-leaded, intermixable, onglaze relief white for hard porcelain, porcelain, bone china, earthenware and vitreous china.

#### Features!

- Very opaque and white
- Can make high relief
- Low C.O.E.
- Low firing temperature
- Low lead release
- Cadmium free
- Can overprint and mix with other colors



### 2. Firing Conditions

Type of ware	Firing range
Porcelain	800–840°C
Bone china	760–840°C
Earthenware	760–830°C
Vitreous china	760–840°C

32286 is suitable for both normal firing for 3–10 hours and fast-firing for 60–120 minutes, cold-to-cold conditions.

## 3. Application

32286 is suitable for screen-transfer printing, direct printing, spraying, pad printing and hand painting.

## 4. Coefficient of Thermal Expansion (C.O.E.)

Product	Thermal Expansion (C.O.E.)
32286 relief white	$5.6 \times 10^{-6}/^{\circ}\text{C}$

32286 is carefully developed and tested under optimum conditions to minimize cracking or chipping problems. The maximum thickness of the color layer should be below  $50\text{--}60 \mu\text{m}$  (approx. by 100 mesh/40T, 3–4 time printing) for porcelain glaze (C.O.E.  $4.5\text{--}5.5 \times 10^{-6}/^{\circ}\text{C}$ ). Thicker printing of more than  $60 \mu\text{m}$  could be allowed for bone china, earthen ware and vitreous china (C.O.E.  $5.5\text{--}8.5 \times 10^{-6}/^{\circ}\text{C}$ ) However, it is necessary to test the cracking or chipping before mass production. The results will depend on the end-user's conditions.

## 5. Particle size of Distribution (P.S.D.)

Product	D <sub>50</sub> average	D <sub>100</sub> biggest
32286 relief white	$2.5\text{--}3 \mu\text{m}$	$15\text{--}20 \mu\text{m}$

## 6. Printing

### 【6.1 Relief printing】

We recommend mesh sizes that are 100–120 mesh (40–48T) polyester for all screen applications. We recommend printing 1–3 times. We do not recommend printing more than 4 times when there is a pinhole and a bubble on the surface and there is a drying time problem. The following is data on the thickness of fired 32286 by different mesh size (polyester), for your reference.

Printing (32286 : PM2, 10 : 6)	100 mesh/40T	120 mesh/48T
1 time printing	$20 \mu\text{m}$	$10 \mu\text{m}$
2 time printing	$30 \mu\text{m}$	$20 \mu\text{m}$
3 time printing	$45 \mu\text{m}$	$35 \mu\text{m}$
4 time printing	$60 \mu\text{m}$	$50 \mu\text{m}$
5 time printing	$75 \mu\text{m}$	$65 \mu\text{m}$

### 【6.2 Normal printing】

32286 can be printed by finer mesh up to 350 mesh (140T) polyester.

## 【6.3 Medium ratio and cover coat】

32286 relief white : Medium PM2	10 : 6-6.5
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We recommend PM2 flowing medium for relief printing. Adding just sufficient medium will improve the surface of relief, if it has pinhole problems.

We recommend C33 cover coat by printing 70 mesh (27T).

Onglaze colors absorb moisture easily. Therefore, keep the powder colors in a dry place. We recommend drying the color powder before using.

## 7. Color and Mixability

32286 can be overprinted and mixed with **SELECTION 32** colors in any proportions except cadmium colors. However, we recommend a testing of the stability of mixing colors and overprinted flux colors under end-user's firing conditions before mass production.

## 8. Chemical durability

Chemical durability of 32286 depends on type of ware, glaze, kiln, color deposit and firing conditions. The following are the results of tests on porcelain, fired at 820°C, with 10 minutes of soaking time and 120 minutes of cold-to-cold firing conditions of gas kiln in production.

### 【8.1 Lead and cadmium release】

According to the DI EN 1388-1-2 test, 3228 shows less than lead 0.04 mg/dm<sup>2</sup>. Cadmium release is below AAS limits. However, it is necessary to be tested the total lead and cadmium release when it is used with other colors.

### 【8.2 Acid resistance】

According to the DI EN 1388-1-2 test, 32286 does not show any visible attack after immersion in a 4% acetic acid solution for 24 hours at a room temperature 22±2°C.

### 【8.3 Alkali resistance】

According to the ASTM C556-88 test, 32286 does not show visible attack for up to 4 hours.

## 9. Material Safety Data Sheet (MSDS)

Material safety data sheet (MSDS) of 32286 is available on request.

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