

Resistant glass colors

Series G 60

(Firing Temperature 580 – 630°C)

General information

The resistant glass colors of the Series G 60 colors are used mainly for the decoration of drinking glasses and beverage bottles.

The colors are delivered as powder (standard unit 5 kg).

If required all colors can be delivered pasted ready for direct printing, either thermoplastic or medium/oil-based.

Characteristics of the powder colors

Particle size diameter is for 95% lower than 20 µm.

The colors of Series 60 are Pb- und Cd-containing.

Due to a possible release the drinking rim of drinking glasses should not be decorated.

The colors contain lithium. Therefore they should not be used for the decoration of bottles that are under pressure after having been filled (carbon dioxide-containing beverages).

The colors are miscible with each other. There have not been any incompatibilities within the series during the whole development stage.

For reaching bright tones (pastel) we recommend a blending with our White G 60 165. This White G 60 165 we recommend also as white underlayer.

The thermal expansion coefficient of the colors is approximately $82 - 95 \times 10^{-7}/K$.

Characteristics of the fired colors / Resistance

An essential property of decorations fired with the colors of this Series is – beside the brilliance and color intensity – the good dishwasher durability as well as the high resistance to chemical exposure and mechanical stress.

The colors show a good durability in industrial dishwashers.

Due to the variety of dishwasher types and detergents you always have to take individual test results into account.

Printing conditions

Colors of the Series G60 have to be homogenized with a three-roll mill. Un sufficient homogenization can lead to matt or rough surfaces.

Direct screen-printing and decals

The layer thickness of color pastes is not only determined by the screen mesh and the pasting ratio. There is also an influence of the squeegee itself, the angle and the pressure applied with the squeegee, the film coating and the printing speed.

The following details are only a recommendation. The exact ratio has to be adjusted by the printer himself, depending on the medium and the kind of decoration.

Pasting ratio:

Color powder	100 parts
Medium	55-60 parts

Screen fabric:

Polyester screens	77-120 threads/cm
Steel screens	220-300 mesh/inch

In principle all media and cover coats are applicable in combination with the colors.

To increase the color intensity and the opacity we recommend pre-printing a white underlayer. For this the color White G 60 165 is suitable.

The pasting ratio should be adjusted accordingly, so that for the layers above a higher medium/oil proportion is used.

Firing conditions

The colors can be fired at a temperature of 580 -630°C with a sufficient holding time. With holding times from 10 to 15 minutes a smooth firing result is reached already at 580°C. With lower holding times a higher firing temperature has to be chosen.

When firing the decorated item the firing temperature and the firing period have to be adjusted to the substrate and the kiln. During the first firing stage (up to approximately 450°C), when organic auxiliary substances burn, a good ventilation is decisive for the quality of the decoration.

Storage

The color powders have to be stored in a dry place, in sealed containers. When they are processed with oily media the powders have to be completely dry. If powders have absorbed humidity this leads to cheesy pastes that cannot be processed perfectly.

Safety

Ceramic colors are chemical products. Special safety guidelines of the Ordinance on Hazardous Substances and the pictographs on packaging and safety data sheets have to be observed.

Information

The information of this publication is based on our current knowledge and experience. In view of the variety of factors that may influence the processing and application of our products, this information does not release the processors from the responsibility of carrying out their own tests and experiments. Neither does it imply any legally binding assurance of certain properties or of suitability for a special purpose. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.

STANDARD RANGE OF BASIC COLORS	NUMBER	PANTONE
Ätzimitation	G 60 050	
Weiß	G 60 164	
Weiß (Unterlage)	G 60 165	
Cd-Neutralgelb	G 60 261	100c
Cd-Mandarin	G 60 266	1505c
Cd-Gelb	G 60 276	7548c
Cd-Intensiv Gelb	G 60 279	116c
Cd-Orange	G 60 285	Orange 021c
Cd-Rotorange	G 60 368	485c
Cd-Rot	G 60 374	180c
Cd-Dunkelrot	G 60 388	1815c
Malachitgrün	G 60 461	3425c
Chromgrün	G 60 464	364c
Blaugrün	G 60 465	322c
Cd-Gelbgrün	G 60 474	377c
Apfelgrün	G 60 475	347c
Mittelblau	G 60 543	2728c
Hellblau	G 60 562	2727c
Cobaltblau	G 60 564	286c
Königsblau	G 60 565	285c
Cobaltblau	G 60 569	2748c
Dunkelblau	G 60 579	289c
Cyan	G 60 591	307c
Rostbraun	G 60 717	173c
Hellbraun	G 60 727	7566c
Rotbraun	G 60 737	7608c
Schokobraun	G 60 761	7601c
Dunkelbraun	G 60 762	477c
Neutralgrau	G 60 861	Cool Gray 8c
Grau	G 60 869	Cool Gray 10c
Hellgrau	G 60 874	Warm Gray 7c
Schwarz	G 60 956	Black c