

Glass Ink GL



Screen Printing Ink for glass, ceramics, metals, aluminium, chrome-plated parts, coated substrates, and thermosetting plastics

Satin-gloss finish, semi-opaque, fast drying 2-component-ink-system, dishwasher-proof

Vers. 5
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Field of Application

Substrates

The screen printing ink Glass Ink GL is excellently suitable for printing onto glass but it is also very well suited for ceramic items, as well as metals, chrome-plated parts, thermosetting plastics, and coated surfaces.

Since all the print substrates mentioned may be different in their printability even within an individual type, preliminary trials are essential to determine suitability for the intended use.

Field of use

Glass Ink GL is designed for indoor decoration prints onto promotional items of glass or ceramics such as glass panes, bottles, and tiles.

After proper drying, GL is also suited for metal-coating with dark mirror protection varnishes. Glass Ink GL also adheres very well onto a variety of metals, such as chrome-plated writing instruments.

This ink is also used in pad printing. For such applications, please see the separate Glass Ink GL technical data sheet.

Glass Ink GL can also be processed with a spray gun, preliminary trials are, however, necessary for this process.

We recommend to filter the thinned ink (25 µm screen) before processing as, otherwise, there could be bubbles in the ink film.

Characteristics

Mixing ratio

Before the ink is printed, it is essential to add Hardener GLH in the correct quantity. This ink/hardener mixture must be stirred homogeneously and adjusted to the right printing viscosity by adding thinner and/or retarder in a correct quantity (stir again). This will slow down the immediately occurring hardening reaction taking thus the pot life to acceptable values. For each colour shade, the ratio is as follows:

20 parts by w. of ink : **1** parts by w. of hardener

Pot life (processing period)

The pot life of the ink/hardener mixture is chemically reactive and must be processed within 12 hours (room temperature 20°C). Higher temperatures reduce pot life. If the mentioned times are exceeded, the ink's adhesion and resistance may be reduced even if the ink characteristics show no noticeable change.

Drying/Hardening

Parallel to physical drying, i. e. the evaporation of the solvents used, the actual hardening of the ink film is caused by the chemical cross-linking reaction between ink and hardener. The standard values concerning progressive cross-linking reaction (hardening) of the ink film are as follows:

Extent of drying	temperature	time
touch-dry	20°C	approx. 20 min
ready for overprinting	20°C	approx. 50 min
final hardness	20°C	approx. 4-6 days
	140°C	approx. 30 min
pot life	20°C	12 hours

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Chemical cross-linking will be accelerated and improved by higher temperatures. For very high demands for water-resistance (dish-washer, etc.), this screen printing ink must be baked at 140°C for 30 min.

Attention

GL 022 has a limited temperature resistance and should, therefore, not be used for mixtures of sensitive colour shades as a colour shift may arise due to the baking process. As an equivalent substitute, a mixture of yellow and red can be used. Preliminary trials are always recommended.

For multi-colour printing, please note that the previous printed ink films should not be entirely cured before the consecutive ink film is printed on it. Only after all ink films have been applied, they should be baked. The ink film achieves its final adhesion and scratch resistance only 24 hours after the baking process.

The processing and curing temperature should not be lower than 15°C as irreversible damage can occur. Also avoid high humidity for several hours after printing as the hardener is sensitive to humidity.

Fade resistance

Only pigments of high fade resistance are used in the Glass Ink GL range. Please note, however, that GL is not suited for outdoor applications with direct sun irradiation or humidity contact as the epoxy resin tends to chalk and as a consequence, the shades will change their original colour soon. The pigments used are resistant to solvents and plasticizers.

Stress resistance

After proper and thorough drying, the ink film exhibits outstanding adhesion, as well as rub, and scratch resistance. After the baking process, Glass Ink GL is further dishwasher-proof. In tests, the prints have resisted more than 300 dishwasher programs.

For higher demands to rub-resistance, we recommend to overcoat with Overprint Varnish GL 910 or Marapoly P 910.

Range

Basic shades

Refer to colour chart 'TP'

GL 20	Lemon	GL 55	Ultramarine
GL 21	Medium Yellow		Blue
GL 22	Yellow Orange	GL 57	Brilliant Blue
GL 32	Carmine Red	GL 58	Deep Blue
GL 35	Bright Red	GL 64	Yellow Green
GL 36	Vermilion	GL 68	Brilliant Green
GL 45	Dark Brown	GL 70	White
		GL 73	Black (reacts to magnets)

All shades are intermixable. To maintain the special characteristics of this outstanding ink range, Glass Ink GL should not be mixed with other ink types.

The basic shades are included in our Marabu-ColorFormulator. They build the basis for the calculation of individual colour matching formulas as well as for shades of the common colour reference systems Pantone®, HKS®, and RAL®, and Marabu System 21. All formulas are stored in the Marabu-ColorManager 2 (MCM 2) software.

Further shades available

GL 273	High-Gloss Black
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Etch imitation effects

GL 913	milky-matt
GL 914	satin-gloss, transparent
GL 915	semi-structured
GL 916	structured

Transparent shades

GL 525	Transparent Yellow
GL 535	Transparent Red
GL 555	Transparent Blue
GL 565	Transparent Green

All etch imitation effects are intermixable and can be modified further in their structure and colour shade by adding the GL transparent shades (1-5 %).

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Shades for 4-colour process prints

GL 429	Process Yellow (Yellow)
GL 439	Process Red (Magenta)
GL 459	Process Blue (Cyan)
GL 473	Process Black (Black)

Press-ready gold and silver shades

GL 191	Silver
GL 192	Rich Pale Gold
GL 193	Rich Gold

The pigments used in the above mentioned standard shades, based on their chemical structure, correspond to the EEC norm EN 71/part 3, safety on toys - migration of specific elements. All colours are suitable for printing onto toys.

Additives

Clears

GL 409	Transparent Base
GL 910	Overprint Varnish, can also be used as bronze binder

Bronzes

(to be mixed with printing varnish GL 910)

S 181	Aluminium (6:1)
S 182	Rich Pale Gold (4:1)
S 183	Rich Gold (4:1)
S 184	Pale Gold (4:1)
S 186	Copper (4:1)
S 190	Aluminium, rub-resistant (8:1)

Due to their chemical structure, Pale Gold S 184 and Copper S 186 have a reduced processing time. Please generally prepare mixtures for one working day only as they cannot be stored and must be processed within 8 h.

All figures in brackets are guidelines which can be varied according to opacity and ink price. The ratio figures in brackets refer to the mixture Overprint Varnish 910 to bronzes whereas the first figure is standing for the parts by weight of Overprint Varnish 910.

Due to the larger grain size of bronze pigments, we recommend a fabric of 120-34 or 120-31 or even coarser.

Bronze shades are always subject to an increased abrasion which can only be reduced by an appropriate overvarnishing with GL 910.

High-Gloss Bronzes

Three further high-gloss bronze concentrates are available to be used by mixing them with Overprint Varnish GL 910 (see separate Technical Data Sheet "High-Gloss Bronze Concentrates").

S 291	High-gloss Silver (5:1 - 10:1)
S 292	High-gloss Rich Pale Gold (5:1 - 10:1)
S 293	High-gloss Rich Gold (5:1 - 10:1)

Due to the smaller pigment size compared to bronze powders, it is possible to work with finer fabrics of 140-31 to 150-34 at an acceptable price. Bronze shades of high-gloss bronze concentrates are highly weather-resistant and have a very small dry abrasion.

Auxiliaries

Hardener:	GLH
Mixing ratio:	20 p. ink : 1 p. hardener
Thinner:	GLV GLTPV
Retarder:	SV 1
Retarder:	SV 9 (for slow printing sequences)
Cleaner:	UR 3
Printing modifier:	VM 1 (max. addition 1%)
Matting powder:	MP (1-3%)

Shortly before use, the hardener should be stirred into the ink. GLH is sensitive to humidity and is always to be stored in a sealed can.

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To adjust the printing viscosity, it is generally sufficient to add 5-10% Thinner GLV. For slow printing sequences and especially when printing fine motifs, the use of Retarder SV 1, resp. SV 9 may become necessary which can be added to the Thinner GLV. For an additional thinning of the ink containing retarder, only thinner without retarder should be used.

Printing modifier VM 1 can rectify flow problems on critical substrates by adding up to 1% by weight to the ink. If an excessive amount of printing modifier is added, flow problems are increased, and adhesion may be reduced, especially when overprinting.

GL can additionally be matted by adding 1-3% of Matting Powder MP.

Fabrics and stencils

All types of commercially available polyester fabrics and solvent-resistant stencils can be used. For a good opacity on coloured substrates, we recommend a mesh count between 68-64 and 90-48, for printing fine details 100-40 to 120-34.

Labelling

For our ink type Glass Ink GL and its additives and auxiliaries, there are current Material Safety Data Sheets according to EC-regulation 91/155 informing in detail about all relevant safety data including the labelling according to the present EEC regulations as to health and safety labelling requirements. Such health and safety data may also be obtained from the respective label.

The ink has a flash point between 21°C and 100°C.

Note

Our technical advice whether spoken, written, or through test trials corresponds to our current knowledge to inform about our products and their use.

This is not meant as an assurance for certain properties of the products nor their suitability for each application. You are, therefore, obliged to conduct your own tests with our supplied products to confirm their suitability for the desired process or purpose. The selection and testing of the ink for specific application is exclusively your responsibility.

Should, however, any liability claims arise, such claims shall be limited to the value of the goods delivered by us and utilised by you with respect to any and all damages not caused intentionally or by gross negligence.