

# Glass Ink GL



**Pad printing ink for glass, ceramics, metal, aluminium, chrome-plated parts, varnished surfaces, and thermosetting plastics**

**Satin gloss, semi-opaque, fast curing 2-component ink system, dishwasher resistant**

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## Field of Application

### Substrates

Glass Ink GL is excellently suited to print onto glass but also onto ceramics, metal, chrome-plated parts, varnished surfaces, and thermosetting plastics.

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

### Field of use

The Glass Ink GL is mainly used for printing onto glass and ceramics, especially to decorate e. g. perfume bottles or promotional goods. This special ink has, compared to other 2-component inks, a very good adhesion to the substrate and is highly water-resistant.

It can also be used for advertising materials made of glass and ceramics which demand a limited dishwasher resistance. Glass Ink GL has an excellent adhesion to metal, such as chrome-plated writing utensils.

## Characteristics

### Mixing ratio

Before the ink is printed, it is a must to add the hardener GLH in the correct quantity. For each colour shade, the ratio is as follows:

**20** parts of ink : **1** part of hardener

### Pot life

The pot life (processing period) at room temperature (approx. 20°C) will be about 8-10 h. 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

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 following standard values concerning progressive cross-linking reaction (hardening) of the ink film are indicated below:

Drying time	temp.	time
touch-dry	20°C	approx. 2-3 min
final hardness	20°C	approx. 4-6 days
	140°C	approx. 30 min
pot life	20°C	approx. 8-10 h

Chemical cross-linking can be accelerated by higher temperatures. For very high demands as to water resistance (dishwasher resistance) and other media, this pad printing ink should 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.

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The times mentioned vary according to substrate, depth of cliché, drying conditions, and the auxiliaries used.

For quick printing sequences, we recommend forced air drying (about 200°C for 2-3 sec) of the surface after each colour.

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, scratch, and block resistance and is dishwasher-resistant after being baked. In tests, the prints have resisted to more than 100 dishwasher cycles.

However, the adhesion and resistance of ceramic inks which are baked at very high temperatures, are not achieved. For higher demands to rub-resistance, we recommend to overcoat with Overprint Varnish GL 910.

## Clichés

All commercially available clichés made of photopolymer material, thin steel, and chemically hardened steel (10 mm) can be used. We recommend a cliché depth of 18-21 µm.

## Printing pads

As per our experience, all common printing pads consisting of materials cross-linked by condensation or addition can be used.

## Printing machines

Glass Ink GL is suitable for closed ink cup systems as well as for open ink wells. Depending on type and usage of the machine, it is to accordingly adjust type and amount of the thinner used.

## Range

### Basic shades

Refer to colour chart 'TP'

GL 020	Lemon	GL 055	Ultramarine Blue
GL 021	Medium Yellow	GL 057	Brilliant Blue
GL 022	Yellow Orange	GL 058	Deep Blue
GL 032	Carmine Red	GL 064	Yellow Green
GL 035	Bright Red	GL 068	Brilliant Green
GL 036	Vermilion	GL 070	White
GL 045	Dark Brown	GL 073	Black

### Further shades available

GL 273 High-Gloss Black

If magnets create problems with Black GL 073, please use the High-Gloss Black GL 273.

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 according to System Tampacolor 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.

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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)

## Transparent shades

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

## Etch imitations

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

## Attention:

There is a further etch imitation in the Glass Ink GL product range, GL 916 (structured). Due to its particle size, however, it is only suited for screen printing applications and **not** for pad printing!

## Press-ready gold and silver shades

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

## Bronzes

(to be mixed with Printing Varnish GL 910)

S 181	Aluminium
S 182	Rich Pale Gold
S 183	Rich Gold
S 184	Pale Gold
S 186	Copper
S 190	Aluminium, rub-resistant

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.

## Clears

GL 409	Transparent Base
GL 910	Overprint Varnish

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

## Auxiliaries

Hardener:	GLH
Mixing ratio:	20 parts ink : 1 part hardener
Thinner:	GLTPV
Retarder:	SV 1
Matting Powder:	MP
Antistatic Paste:	AP
Cleaner:	UR 3
Levelling Agent:	VM 1, addition: 0 - max. 1%

The hardener should be added to the ink briefly before printing in the correct ratio as mentioned before. To adjust printing viscosity, it is generally sufficient to add 5-10% of Thinner GLTPV to the ink.

For the printing of very fine motives, Retarder SV 1 may be added to the thinner. An excessive addition may result in ink transfer problems.

## Attention

For an ink mixture containing retarder, only thinner should be used for additional thinning during the print run.

By adding Matting Powder MP, the glossy effect of the ink is reduced to a silky or semi-matt finish. The addition of a low percentage of MP (in the case of 070 White, max. 5%) will not influence significantly the resistances of the ink but reduce its opacity.

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

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## Cleaning

To clean ink containers, clichés, and tools, please use our Cleaner UR 3.

## Recommendation

The ink should be stirred well before printing. To protect the ink in opened containers against excessive drying, it can be carefully covered with a layer of thinner which can then be later stirred into the ink prior to printing.

## 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 labelling according to the present EEC regulations as to health and safety labelling requirements. Such data may also be derived from the respective label.

Please pay special attention to a proper usage of Hardener GLH as the hardener, based on its chemical structure, has strong irritant characteristics.

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

## Note

Please refer to the information in our technical data sheets of pad printing inks. 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, they 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.