

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

Vers. 1
2002
27 Mar

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 for example perfume bottles or advertising articles. 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 by weight of ink:
1 part by weight of hardener

Pot life

The pot life (processing period) at room temperature (approx. 20 °C) will be about 8-10 hours. 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 crosslinking reaction between ink and hardener.

The following standard values concerning progressive crosslinking reaction (hardening) of the ink film are indicated below:

Extent of drying	temp.	time
touch-dry	20°C	approx. 25 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	8-10 hours

Chemical crosslinking 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.

For multiple colour printing, we point out that the previous printed ink films should not be entirely cured before the consecutive ink film is printed on top of it.

Ink GL

Only after all ink films have been applied, they should be baked. The ink film achieves its final adhesion and scratch resistance only after 24 h.

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.

Shades mixed by adding overprint varnish or other colour shades, and especially white, have a reduced fade and weather resistance depending on their mixing ratio. The fade resistance also decreases if the printed ink film thickness is reduced.

Weather resistance of the prints with Glass Ink GL is limited, due to its chemical structure. The prints tend to chalk, the surface of epoxide resin coats are destroyed when used outdoors and thus pigments and filling products are set free.

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 programs.

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.

Range

Refer to shade card "TP".

GL 20	Lemon	GL 55	Ultramarine blue
GL 21	Medium Yellow	GL 57	Brilliant blue
GL 22	Yellow orange	GL 58	Deep blue
GL 32	Carmin red	GL 64	Yellow green
GL 35	Bright red	GL 68	Brilliant green
GL 36	Vermilion	GL 70	White
GL 45	Dark brown	GL 73	Black (reacts to magnets)

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

Glass Ink GL is included in our computerised colour matching system Marabu-mix.

By using these basic shades in accordance with the mixing ratios provided by the Marabu-ColorManager software, it is possible to produce shades of the popular colour reference systems HKS®, RAL®, and Marabu System 21.

If magnets create problems with Black GL 73, please use the High-Gloss Black GL 273.

Further shades available

GL 273	High-Gloss Black (does not react to magnets)
GLI	Etch Imitation

Shades for 4-colour process prints

GL 429	Process Yellow (Yellow)
GL 439	Process Red (Magenta)
GL 459	Process Blue (Cyan)
GL 489	Process Black (Black)

Press-ready gold and silver shades

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

Ink GL

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
- 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 and Copper have a reduced processing time. Please prepare mixtures daily, as they cannot be stored and must be processed within 8 h.

For the processing of metallics, we refer you to our separate data sheet "Bronze Inks".

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, the 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 3-5 % of MP will not influence significantly the chemical resistance of the ink.

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.

Cleaning

To clean ink containers, clichés, and tools, please use our Cleaner UR 1.

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.

Ink GL

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 health and safety data may also be derived from the respective label.

Please pay special attention to 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. Since the ink is not considered as a flammable liquid due to its pastous nature, any specific regulations for the handling of flammable liquids do not apply.

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.