

Ultraglass UVGL



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UV screen printing ink for flat glass used indoor, as well as for packaging and restaurant glass

Fast curing, very high scratch resistance, excellent alkaline, chemical, and dish washer resistance, no additional oven drying

Field of Application

Substrates and field of use

Ultraglass UVGL is a glossy, UV-curable screen printing ink especially suited for

- pre-treated and non pre-treated flat glass for indoor use, e. g. mirrors, glass for furniture and dividers, gambling machines, etc.
- pre-treated, cold-end coated packaging glass, e.g. drinking bottles
- pre-treated and non pre-treated cosmetic bottles
- pre-treated and non pre-treated restaurant glass, e.g. drinking glasses, ashtrays, vases

For a good adhesion, a uniform surface tension of the substrate with $> 44 \text{ mN/m}$ is generally important.

Furthermore, the glass surface must absolutely be free from graphite, silicone, dust or residues like grease or similar (e.g. fingerprints).

A pre-treatment of the glass by flaming immediately before printing will generally enhance the adhesion of the ink to the substrate. When using cold end coated glass, the flaming is necessarily to be carried out. Best possible adhesion is achieved by Uvitro® or Pyrosil® pre-treatment.

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

Characteristics

Ink characteristics

UVGL is a 2-component ink system. Prior to printing, it is to add Adhesion Modifier UV-HV 8 in the correct quantity and to stir homogeneously. This mixture has a pot life of min. 10 hours referred to a room temperature of 18° to 25°C.

All UVGL shades are glossy and brilliant. They can also be metal-coated if required.

UVGL is a fast curing ink and therefore also suited for high printing speeds at white glass production of up to 80 passes/min resp. 20 m/min.

Adjustment of the ink

Before printing, it is to adjust Ultraglass UVGL with Adhesion Modifier UV-HV8 as follows (pot life approx. 10 h):

- 2% of UV-HV 8: colour shades, black, 4-colour process shades and varnish
- 4% of UV-HV 8: white, opaque white, high-opaque colours and colour matches with a percentage of white $> 50\%$, bronzes and etch imitation effects

For vertical screen printing, as well as automatic ink feeding, the viscosity can further be reduced by adding 1-10% Thinner UVV6 to the ink. During the curing process, the thinner will be chemically cross-linked and must therefore not be overdosed.

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Curing

Ultraglass UVGL is a fast curing UV-ink. A UV-curing unit with one medium pressure Mercury Vapour Lamp (180- 200 W/cm) will cure UVGL at a belt speed of 4800 passes/h. UVGL 170 Opaque White, all etch imitations, as well as high-opaque shades and bronzes cure more slowly due to their high amount of pigments (3300 passes/h, resp. 12 m/min ca.).

The curing speed of the ink is generally depending on the kind of UV-curing unit (reflector), number, age and power of the UV-lamps, the printed ink film thickness, the inherent colour of the glass, as well as the number of passes of the UV-curing unit.

Post-curing

After UV-curing, no additional heat-forced oven drying is necessary. The ink will post-cure within the first 24 hours and achieve its full chemical and mechanical resistance by then. It is a must, however, to carry out preliminary tests prior to printing.

Fade resistance

Pigments of medium to high fade resistance are used in the Ultraglass UVGL ink type. Owing to the binding agents used, however, all UVGL shades are suited to a limited outdoor use of up to 3 successive months.

Stress resistance

The following resistances can be achieved:

- domestic dish washer (65°C for 130 min), minimum 500 cycles
- Winterhalter glass dish washer (85°C for 3 min), minimum 3500 cycles
- alkaline resistance: 2.3% of NaOH (80°C for 30 min)
- 500 double rub strokes (350g): ethanol and glass cleansing agent were found to be o.k.
- 100 double rub strokes (350g): acetone was found to be in order
- resistance to perfume: after 24 h long duration test ok
- ink adhesion after frost test at -18°C was ok

Fabrics, mileage

The fabric selection depends on the desired curing speed and productivity, as well as the requested opacity. Generally, all fabrics from 120-34 to 165-27 (1:1 plain weave) can be used but we especially recommend a 140-31 mesh. For the printing of 4-colour process shades, we recommend a fabric between 150-27 and 180-27 (1:1 plain weave).

A high and uniform screen tension (>16 N) is further important to guarantee a defined ink deposit. According to the type of fabric and substrate, the ink will be enough for 50-70 m²/kg

Stencil

UVGL can be processed with all solvent-resistant stencil techniques such as capillary films (15-20µ), photo emulsions or combination stencils.

Range

Basic shades

(See colour chart 'System Ultracolor')

UVGL 922	Light Yell.	UVGL 952	Ultramarine
UVGL 924	Medium Yell		Blue
UVGL 926	Orange	UVGL 956	Brilliant Blue
UVGL 932	Scarlet Red	UVGL 960	Blue Green
UVGL 934	Carmine Red	UVGL 962	Grass Green
UVGL 936	Magenta	UVGL 970	White
UVGL 950	Violet	UVGL 980	Black

All shades are intermixable. Mixing with other ink types (also with UVGO!) should be avoided in order to maintain the special characteristics of this outstanding ink range.

The basic shades according to System Ultracolor are included in our Marabu-ColorFormulator (MCF). 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®. All formulas are stored in the Marabu-ColorManager 2 (Version 2.2) software.

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Further shades available

UVGL 170	Opaque White
UVGL 180	Opaque Black

High-opaque shades (end of 2006)

UVGL 122	Light Yellow, high opaque
UVGL 132	Scarlet Red, high opaque
UVGL 152	Ultramarine Blue, high opaque
UVGL 162	Grass Green, high opaque

Shades for 4-colour process printing (end of 2006). All 4-colour process shades have a higher density.

UVGL 425	Process Yellow
UVGL 435	Process Red (Magenta)
UVGL 455	Process Blue (Cyan)
UVGL 485	Process Black

Etch imitation effects (end of 2006)

UVGL 913	Varnish, milky-matt
UVGL 914	Varnish, satin-transparent

All shades are based on organic pigments, therefore, the heavy metal content complies with the EEC regulations EN 71, part 3, "Safety of toys" - migration of specific elements.

When printing onto drinking glasses or bottles it is important to place the decoration outside the area coming into direct contact with the mouth since the possible presence of residual monomers and degradation products of the photoinitiators cannot be completely excluded even if sufficiently cured. In the practice, a distance of 2 cm between decoration and rim has been proven successful.

Please note that there is no FDA approval for UVGL as we did not use explicitly FDA approved materials for the formulation of the ink.

Additives

Special Binder UVGL 904

- accelerates the curing process
- extends the ink
- suited as bronze binder

An addition of Special Binder UVGL 904 (1-25 % parts by weight) accelerates the curing speed of colour shades reducing at the same time opacity. It is not highly transparent.

Transparent Base UVGL 409 (end of 2006)

Thixotropic auxiliary for 4-colour-process printing, as well as for fine detail and reverse printing, and to reduce the density of 4-colour process shades, as well.

High-gloss bronzes, pastes

There are 8 high-gloss bronze pastes available which can be mixed with UVGL 904 Special Binder. They can be chosen according to the required opacity, cost limit and curing characteristics.

Low-cost bronzes

Slightly structured, long pot life, reduced opacity.

S-UV 191	High-gloss Silver (4:1 - 7:1)
S-UV 192	Rich Pale Gold (4:1 - 7:1)
S-UV 193	Rich Gold (4:1 - 7:1)

High-gloss fine bronzes

Long pot life and excellent opacity but reduced rub resistance. Due to this, an overprint with UVGL 904 is necessary.

UVGO 595 33 296	High-gloss Silver (6:1-9:1)
UVGO 595 34 297	High-gl. Rich Pale Gold (6:1-9:1)
UVGO 595 35 298	High-gloss Pale Gold (6:1-9:1)

High-opaque metallic bronzes

Slightly structured, excellent rub resistance, pot life max. 12 h.

S-UV 291	High-gloss Silver (4:1 - 10:1)
S-UV 293	High-gloss Rich Gold (4:1 - 10:1)

All figures in brackets are guidelines which can be varied according to opacity and curing speed. The ratio figures in brackets refer to the mixture Bronze Binder UVGL 904 to bronze powder whereas the first figure is standing for the parts by weight of UVGL 904.

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Prior to printing, it is to add 4% Adhesion Modifier UV-HV 8 to the mixture UVGL 904 plus high-gloss bronze/paste and to stir homogeneously. The processing time (pot life) is min. 8 h referred to a room temperature of max. 25°C.

For more details, please refer to our technical data sheet "High-gloss bronzes".

Auxiliaries

Thinner UVV 6

Thinner for reducing the printing viscosity at vertical screen printing or automatic ink feeding by pump operation.

Recommended addition: 1-10%.

Adhesion Modifier UV-HV 8

Prior to printing, it is to add Adhesion Modifier UV-HV 8 to the ink (Pot life 10 h ca.). For more details, see chapter "Adjustment of the ink" on page 1.

Accelerator UV-B1

Auxiliary to accelerate the curing reaction of the ink and to increase the adhesion to the substrate due to an improved depth curing.

Addition: 1 – 2% party by weight

Cleaning

The appropriate Cleaner is UR 3. Ink residues mixed with adhesion modifier must be removed from the screen immediately after printing.

Shelf life

Shelf life depends very much on the formula/reactivity of the ink system as well as the storage temperature. It is one year for an unopened ink stored in a dark room at a temperature of 15-25°C. Under different conditions, particu-

larly higher storage temperatures, the shelf life is reduced. In such cases, Marabu's warranty expires.

Labelling

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

Safety Regulations for UV Screen Printing Inks

UV-inks contain skin irritating material. We recommend that all UV-curing screen printing inks and auxiliaries should be handled with particular care. Skin polluted with ink must be cleaned immediately with water and soap.

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.