

UV screen printing ink for packaging and restaurant glass, as well as float glass suited for indoor use

High gloss, fast curing, excellent dish washer resistance, very good alkaline and chemical resistance

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Field of Application

Substrates and field of use

Ultraglass UVGO is a UV curable screen printing ink especially suited for

- 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
- pre-treated and non pre-treated float glass for indoor use, e.g. gambling machines, glass for furniture, dividers, and many more

For a good adhesion, a uniform surface tension of >44 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

UVGO 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. 8 hours referred to a room temperature of 18° to 25°C.

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

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

Adjustment of the ink

Before printing, it is to adjust Ultraglass UVGO with Adhesion Modifier UV-HV8 as follows (pot life approx. 8 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% of 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 UVGO is a fast curing UV-ink. A UV-curing unit with one medium pressure Mercury Vapour Lamp (180- 200 W/cm) will cure UVGO at a belt speed of 4800 passes/h. UVGO 170 Opaque White, all high opaque shades and bronzes cures more slowly due to their high amount of pigments (approx. 3300 passes/h).

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 self-colour of the glass, as well as the number of passes of the UV-curing unit.

Oven drying

After UV-curing, the following oven drying forced by heat is necessary:

160°C at 20 min or
140°C at 30 min

By doing this, the best possible adhesion to the glass, as well as high resistances are achieved. In the case of lower requirements to the final product, IR drying can be used or also completely done without IR or oven drying. The ink will post-cure within the first 24 hours and resistances can be tested only after that time. Preliminary tests, however, are always necessary.

Fade resistance

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

Stress resistance

The following successful resistances are referred to oven-dried prints:

- domestic dish washer (65°C for 130 min), minimum 300 cycles
- Winterhalter glass dish washer (85°C for 3 min), minimum 3000 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 o.k.
- ink adhesion after frost test at -18°C was o.k.

Fabrics, productivity

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) instead.

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

UVGO 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')

UVGO922	Light Yell.	UVGO952	Ultramarine
UVGO924	Medium Yell		Blue
UVGO926	Orange	UVGO956	Brilliant Blue
UVGO932	Scarlet Red	UVGO960	Blue Green
UVGO934	Carmine Red	UVGO962	Grass Green
UVGO936	Magenta	UVGO970	White
UVGO950	Violet	UVGO980	Black

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All shades are intermixable. Mixing with other ink types 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-ColorManager2 (version 2.2) software.

Further shades available

UVGO 170	Opaque White
UVGO 180	Opaque Black

High-opaque shades

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

Shades for 4-colour process printing

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

Transparent shades

UVGO 525	Transparent Yellow
UVGO 535	Transparent Red
UVGO 555	Transparent Blue
UVGO 565	Transparent Green
UVGO 585	Transparent Black

Etch imitation effects

UVGO 913	Varnish, milky-matt
UVGO 914	Varnish, satin-transparent
UVGO 915	Varnish, semi-structured
UVGO 916	Varnish, structured

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 UVGO as we did not use explicitly FDA-approved materials for the formulation of the ink.

Additives

Overprint Varnish UVGO 910

Highly transparent overprint varnish for over-varnishing or an individual addition of varnish, also suited as a bronze binder for high-gloss bronzes as well as for window decorations on obscured glass surfaces.

Special Binder UVGO 904

- accelerates the curing process
- extends the ink

An addition of Special Binder UVGO 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 UVGO 409

Thixotropic auxiliary to aid 4-colour-process prints, fine detail or reverse printing. By adding transparent paste to the 4-colour-process ink, the ink's density is reduced and adjusted to the sample.

High-gloss bronzes, pastes (to be mixed with UVGO 910)

UVGO 595 33 296	High-gloss Silver (8:2)
UVGO 595 34 297	High-gloss Rich Pale Gold (7:3)
UVGO 595 35 298	High-gloss Pale Gold (7:3)

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

Auxiliaries

Thinner UVV 6

Thinner for reducing the printing viscosity at vertical screen printing or automatic ink feeding by pump operation. Recommended addition quantity is 1-10%.

Adhesion Modifier UV-HV 8

Prior to printing, it is to add Adhesion Modifier UV-HV 8 to the ink between 2 or 4%. More details see the chapter "Adjustment of the ink" on page 1.

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 two years for an unopened ink if stored in a dark room at a temperature of 15°C to 25°C. Under different conditions, particularly higher storage temperatures, the shelf life is reduced. In such cases, Marabu's warranty expires.

Labelling

For our ink type Ultraglass UVGO 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 health and safety data may also be obtained from the respective label.

Safety Regulations for UV Screen Printing Inks

UV inks contain skin irritating material. Therefore, 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.