

UV screen printing ink for packaging and restaurant glass, as well as float glass for indoor use, ceramics, metals, anodized aluminium, and varnished surfaces

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

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Field of Application

Substrates

Ultra Glass UVGO is suited for

- Silane pre-treated, cold end coated packaging glass, e.g. drinking bottles
- Silane or flame pre-treated cosmetic bottles
- Silane pre-treated restaurant glass, e.g. drinking glasses, ashtrays, vases
- Pre-treated float glass for indoor use, e.g. gambling machines, glass for furniture, dividers, and many more
- Ceramics
- Metals
- Anodized aluminium
- Varnished surfaces

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, silane pre-treatment is necessary. 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 the suitability for the intended use.

Characteristics

All UVGO shades feature high gloss and brilliance. 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.

Recommendation

The ink should be stirred homogeneously before printing and if necessary during production.

Ink Adjustment

UVGO is a 2-component ink system. Before printing, it is necessary to adjust Ultra Glass UVGO with Adhesion Modifier UV-HV 8 as follows:

Basic shades, black, varnish:
2% UV-HV 8

White, opaque white, mixed inks containing > 50% white, etch imitation, metallics:
4% UV-HV 8

For vertical screen printing, as well as automatic ink feeding, the viscosity can further be reduced by adding thinner to the ink. During the curing process, the thinner will be chemically crosslinked and must therefore not be overdosed.

Pre-reaction time

It is recommended to allow the ink/hardener mixture to pre-react for 15 minutes.

Pot life

The ink/hardener mixture is chemically reactive and must be processed within 8 h (referred to 20-25 °C and 45-60 % RH). Higher temperatures reduce the pot life. If the mentioned times are exceeded, the ink's adhesion and resistance may be reduced even if the ink still seems processable.

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Drying

Ultra Glass 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. Owing to their high amount of pigments, UVGO 170 Opaque White and metallic shades require a slower curing pace (approx. 3300 passes/h).

The curing speed of the ink is generally dependant upon the kind of UV-curing unit (reflectors), number, age, and power of the UV-lamps, the printed ink film thickness, colour shade, substrate in use, as well as the printing speed.

Oven drying

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

160° C for 20 min. or 140° C for 30 min.

By doing this, the best possible adhesion to the glass as well as high resistance is achieved.

In the case of lower requirements to the final product, IR drying can be used or also completely done without IR/oven drying. The ink will post-cure within the first 24 hours and resistances can be tested after that time. Preliminary tests, however, are always necessary.

Fade resistance

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

Stress resistance

After proper and thorough drying, the ink film exhibits outstanding adhesion, as well as rub, and scratch resistance. The printed ink film must be tempered for 30 min at 140°C.

Dish washer resistance:

- Domestic dish washer at least 300 cycles (65° C at 130 min with customary cleaner Type B/ low alkaline detergent)

- Winterhalter glass washer (85° C at 3 min): at least 3000 cycles

Chemical Resistance:

- Alkaline: 2.3% NaOH, 80° C for 30 min
- Perfume: 24 h test
- Ethanol and glass cleansing agent: 500 DRS
- Aceton: 100 DRS

Test device: Taber® Abraser 5700,
DRS: Double Rub Strokes (350 g)

- Frost Test -18° C

In order to increase the mechanical resistance, we recommend an overprint with UVGO 910. Bright colour shades, e.g. white, may darken if the print is constantly exposed to temperatures > 40° C.

Range

Basic Shades

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

High Opaque Shades

170	Opaque White
180	Opaque Black

Further Products

910	Overprint Varnish
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All shades are intermixable. Mixing with other ink types or auxiliaries must be avoided in order to maintain the special characteristics of this ink.

All basic shades are included in our Marabu-ColorFormulator (MCF). They build the basis for the calculation of individual colour match-

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ing formulas, as well as for shades of the common colour reference systems HKS®, PANTONE®, and RAL®. All formulas are stored in the Marabu-Color Manager software.

We do not recommend this ink for toys due to the foreseeable contact with the mouth since the possible presence of residual monomers and decomposition products of the photo-initiators cannot be excluded even when sufficiently cured.

Metallics

Prior to printing, 4% Adhesion Modifier UV-HV 8 must be added to the mixture UVGO 910 plus Metallic and the mixture must be stirred homogeneously.

Metallic Pastes

S 191	Silver	15-25%
S 192	Rich Pale Gold	15-25%
S 193	Rich Gold	15-25%
S-UV 191	Silver	15-25%
S-UV 192	Rich Pale Gold	15-25%
S-UV 193	Rich Gold	15-25%
S-UV 291	High Gloss Silver	10-25%
S-UV 293	High Gloss Rich Gold	10-25%
S-UV 296	High Gloss Silver	10-17%
S-UV 297	High Gloss Rich Pale Gold	10-17%
S-UV 298	High Gloss Pale Gold	10-17%

These metallics are to be added to UVGO 910 in the recommended amount, whereas the addition may be individually adjusted to the respective application. We recommend preparing a mixture which can be processed within a maximum of 8 h since metallic mixtures usually cannot be stored.

Owing to the smaller pigment size of Metallic Pastes it is possible to work with finer fabrics like 140-31 to 150-31. All metallic shades are displayed in the Marabu "Screen Printing Metallics" colour chart.

Auxiliaries

UV-HV 8	Adhesion Modifier, see chapter ink adjustment	2-4%
UVV 6	Thinner	1-10%
UR 3	Cleaner (flp. 42°C)	
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 72°C)	

Prior to printing, Adhesion Modifier UV-HV 8 must be added in the correct quantity and the mixture must be stirred homogeneously. Please see chapter ink adjustment for ratio recommendations.

The addition of thinner reduces the ink viscosity if necessary. An excessive addition of thinner will cause a reduction of the curing speed, as well as of the printed ink film's surface hardness. The thinner becomes part of the cross-linked matrix when UV-cured and may slightly change the inherent odour of the printed and cured ink film.

The cleaners UR 3 and UR 4 are recommended for manual cleaning of the working equipment. Cleaner UR 5 is recommended for manual or automatic cleaning of the working equipment.

Printing Parameters

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.

A high and uniform screen tension (> 16 N) is further important to guarantee a defined ink deposit.

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

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Shelf Life

Shelf life depends very much on the formula/ reactivity of the ink system as well as the storage temperature. It is 2.5 years for an unopened ink container if stored in a dark room at a temperature of 15-25°C. Under different conditions, particularly higher storage temperatures, the shelf life is reduced. In such cases, the warranty given by Marabu expires.

and soap. Please read the notes on labels and safety data sheets.

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 foregoing information is based on our experience and should not be used for specification purposes.

The selection and testing of the ink for specific applications 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.

Labelling

For Ultra *Glass* UVGO and its auxiliaries, there are current Material Safety Data Sheets available according to EC regulation 1907/2006, informing in detail about all relevant safety data including labelling according to EC regulation 1272/2008 (CLP regulation). Such health and safety data may also be derived from the respective label.

Safety rules for UV printing inks

UV-inks contain some substances which may irritate the skin. Therefore, we recommend to take utmost care when working with UV-curable printing inks. Parts of the skin soiled with ink are to be cleaned immediately with water