

UV-curable screen printing ink for polymers like polypropylene, polyethylene, rigid PVC, self-adhesive foils, polystyrene

Satin gloss/glossy, fast curing, press-ready, flexible ink film, low embrittlement, excellent detail printing, low odour

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Field of Application

Substrates

Ultra *Graph* UVGX is suited for the following substrates:

- pre-treated polyethylene (PE)
- pre-treated polypropylene (PP)
- rigid PVC/ rigid PVC foam
- self-adhesive PVC foils
- polystyrene (PS)

In order to achieve best ink adhesion, the surface tension of PE/PP must not be lower than 38mN/m. Even though these substrates are usually pre-treated by the manufacturer, this effect wears off during storage time, so adhesion may be reduced. Therefore, if the surface tension is lower than 38mN/m, we recommend another pre-treatment with suitable methods like Corona, Plasma, or flame.

PE and PP sheets should ideally have a minimum surface tension of 42-46 mN/m. Generally, UVGX shows good adhesion even if the surface tension is quite low (minimum 38mN/m).

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

Ultra *Graph* UVGX can be used on single and multicolour lines and is especially suited for graphic prints like hanging, standing or wall-mounted promotional displays (POS/POP), signs, posters, stickers, etc., for in- and outdoor purposes.

Please consider the limited humidity resistance, especially for outdoor use.

Characteristics

Ultra *Graph* UVGX process shades are adjusted to a satin gloss level, while the Ultracolor shades are glossy. The printed ink film is very flexible so that it is best suited for the following processing steps such as stamping, cutting, and grooving. Ultra *Graph* UVGX nearly doesn't cause any embrittling of the substrate, and the smell of the ink is almost undetectable during the printing process, as well as after the curing process.

Ink Adjustment

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

Use as 2-component ink

Depending upon the substrate and the requirements, hardener can be added to the ink before printing.

When using hardener, the processing and curing temperature must not be lower than 15°C as irreversible damage can occur. Please also avoid high humidity for several hours after printing as the hardener is sensitive to humidity.

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 6-8 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 Graph UVGX is a fast curing UV ink. A UV-curing unit with two medium-pressure mercury lamps (120 W/cm) cures UVGX at a belt speed of up to 30 m/min. UVGX is also suitable for Scan curing on multi colour lines. 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.

Ultra Graph UVGX is a post-curing UV ink which will achieve its final adhesion and resistances after 24 hours. The ink film should pass a cross hatch tape test after having cooled down to room temperature.

Fade resistance

The Ultra Graph UVGX process shades 424 and 434 contain pigments suited for 6 months outdoor use, whereas all other UVGX shades are suited for a 2-year vertical outdoor exposure, referred to the middle European climate.

Stress resistance

After proper and thorough drying, the ink film exhibits outstanding adhesion as well as rub, scratch, and block resistance. UVGX has a rather low chemical resistance due to other characteristics, e.g. flexibility.

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

4-Colour Process Shades Standard

424	Process Yellow
434	Process Magenta
455	Process Cyan
485	Process Black

High Opaque Shades

170	Opaque White
180	Opaque Black

Further Products

409	Transparent Base
904	Special Binder

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

Auxiliaries

H 2	Hardener	2-4%
UVV 2	Thinner	1-5%
UVV 3	Thinner	1-5%
UVV 6	Thinner	1-5%
UV-B 5	UV Accelerator	1-4%
UV-B1	UV Accelerator	1-2%
STM	Thickening Agent	0.5-2%
UV-TA 1	Thickening Agent	0.1-0.5%
UV-VM	Levelling Agent	0-0.5%
UR 3	Cleaner (flp. 42°C)	
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 72°C)	

Hardener H 2 is sensitive to humidity and is always to be stored in a sealed container. Harden-

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er H 2 can be added for increased re-sistance and adhesion. The mixture ink/hardener is to be stirred well and homogeneously. The mixture ink/hardener is not storable and must be processed within the pot life.

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.

UV-B 5 accelerates the surface curing.

UV-B 1 accelerates the curing speed if necessary and may increase the adhesion to the substrate owing to a better depth curing.

The Thickening Agent STM enhances the ink's viscosity without significantly influencing the degree of gloss. Please stir well, the use of an automatic mixing machine is recommended.

The liquid Thickening Agent UV-TA 1 increases the viscosity and improves the dot definition at higher processing temperatures.

The Levelling Agent UV-VM helps to eliminate flow problems which may arise due to residuals on the substrate's surface or incorrect adjustment of the machines. An excessive amount may reduce the ink's adhesion when overprinting. UV-VM must be stirred homogeneously before printing.

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

Selection of fabric depends on the printing conditions, the desired curing speed and yield as well as the required opacity. Generally, fabrics of 120-34 to 165-27 can be used.

Control and reduction of the printed ink film are fundamental for 4-colour process printing with UV-curable inks. We recommend a mesh count between 150-27 and 165-31 threads (plain weave). A uniform screen tension (> 16 N) of all fabrics used is further important.

Shelf Life

Shelf life depends very much on the formula/reactivity of the ink system as well as the storage temperature. It is 2 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.

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 *Graph* UVGX 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.

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

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