

UV-curing screen printing ink

SERIES 540 UV-GL

UV-curable screen printing ink for decorative and functional prints on glass and-metals

High gloss UV-screen printing ink for decorative and functional print on glass, mirrors and different metals, based on high resistant and solvent free raw materials.

The created properties of this series are without problems on glass, mirrors and different metals. Also are some ceramic and silica materials suitable.

In addition to this main materials it's possible to print on duroplastics, coatings and a lot of thermoplastic, mostly rigid plastic substrates. This wide variety of printable materials and also the multifarious surface properties makes it absolutely necessary for own printing tests under local conditions with regard to the intended purpose prior to starting the production.

Due to the constant further development and optimizing of Series 540 UV-GL the number of practical substrates may still increase.

Application

Operational areas are a lot of decorative and functional applications on glass and mirrors, special for the furniture industry. Actual use are also glass for slot machines, microwave equipment and other decorative applications for indoor-use. In the moment metal plates and panels, sawblades and others complete the range of use. A lot of requirements for chemical resistances (special against household cleaners) and climate-stability by indoor-use are accomplished through careful selection of raw materials. The high gloss and smooth surface gives the extreme high abrasion resistance and mechanical stability of crosslinked ink.

The adhesion and special the water- and humidity-resistances are improved through addition of 5 to max. 10 weight-% of hardener Series 500-GL. The pot life is in relation to regional conditions (temperature, humidity) and quantity of addition, but always >12 hours.

Characteristics

This UV-series is free of amines and critical physiological substances like NVP, TMPTA and also solvents. But: Series 540 UV-GL is a high reactive UV-curable system and must be supposed with the UV-typical handling in printing process. Belong to the Material Safety Data Sheet (MSDS) additional informations are available.

The very low shrinking inclination of used monomer and oligomer materials minimize the risk of overcuring so a multi-layer application is realistic under normal conditions without any problems of intercoat adhesion.

In daily practice 120-34 polyester (305 mesh) or coarser fabrics are used to get the properties like opacity, resistance and overprintability.

In all cases of UV-application, the substrate must be free of pollution's like oxidizing substances, fat, migrated additives of protection foils, lubricants of injection moulded processes and dust. Only under these conditions it's possible to get good adhesion and in correlation to this most important characteristic all other ink specifics. Glass and ceramics must conditioned before print. This means, that to cold

substrates (< 18°C) advance the foundation of condensed Water between glass surface and crosslinked ink. This effect gives bad abrasion resistance and sometimes complete lost of adhesion.

Auxiliary Agents

Series 540 can be used directly from the can and combined rheologic properties for the full area print with very smooth surface and for the fine detail print with exact definition.

For special, individual modifications the printer can fall back on different auxiliary agents like UV-thinner, UV-initiator or wetting additives. For application and addition please refer to our UV-leaflet "Series 500: Auxiliary agents for UV-curable products". If possible, addition of additives should be avoided as incorrect use, above all overdosage, may cause constant and unfavorable effects to the original product properties.

Pigments and Light Fastness

The Series 540 is free of heavy metals, monopigmented with high opaque characteristics. This advantage gives the opinion to print the most special color shades directly on transparent substrates without white pre-print. The user gets a practical range of high pigmented basic colors to cover the normal chromatic range.

Series 540-1005	MS-Light Yellow
Series 540-1205	MS-Dark Yellow
Series 540-2005	MS-Orange
Series 540-3005	MS-Red
Series 540-4005	MS-Violet
Series 540-4505	MS-Dark Blue
Series 540-8005	MS-Black
Series 540-9005	MS-White

In addition to this opaque base colors the customer find five transparent, extremely high pigmented color shades for special mixtures and to increase sometimes the brilliance:

Series 540-1105	MS-Medium Yellow
Series 540-3105	MS-Magenta Red
Series 540-3305	MS-Magenta
Series 540-5005	MS-Blue
Series 540-6005	MS-Green

All color shades, the opaque base colors and also the transparent basic colors are high pigmented and documents in the moment the maximal optical properties and possibilities on the market.

As standard inks we offer also the high opaque qualities
Series 540-33 ST-Black
Series 540-00 ST-White

The process colors for 4-color halftone prints are ready to print and follows the Europe scale:

Series 540-0950 ST-Process Cyan
Series 540-0960 ST-Process Yellow
Series 540-0970 ST-Process Magenta
Series 540-0980 ST-Process Black
and in addition the transparent bases
Series 540-04 ST-Transparent paste
Series 540-06 ST-Thixotropic paste

As standard varnishes are the systems
Series 540-05 ST-Varnish
Series 540-05/MT ST-Varnish, mat
available and this in complement with nearly all individual specialties. One of the most famous products is the sand-blast imitation Series 540-05/48.

In the area of fluorescent shades the following highly brilliant systems are available:

Serie 540-40 ST-Neon Lemon
Serie 540-41 ST-Neon Luminous Orange
Serie 540-43 ST-Neon Flame Red
Serie 540-46 ST-Neon Cyclamen
angeboten.

As metallic effect colors we have the standard range

Series 540-100 ST-Silver
Series 540-101 ST-Britanniasilver
Series 540-102 ST-Rich Gold
Series 540-103 ST-Rich Pale Gold

Gold and silver bronzes are metal particles which could react with the pH-acidic UV-components. Therefore mixed bronze inks should be processed quickly. Depending on the bronze used oxidation reactions may cause color changes (darker) or thickening of the mixed system due to catalytic effects.

All inks of this series are non toxic and follow the europe regulation EN 71, part 3. All pigments used in Series 540 shows a light fastness of 6-8 according to wool scale (DIN 16525). If the color shades are reduced with high amounts of white or transparent systems, light fastness might be reduced.

Drying

Series 540 only polymerize to a stable and durable ink film under UV-light of suitable wave length (high or middle pressure mercury lamps with at least 80 W/cm or 200 W/inch). Curing parameter depend on layer thickness, ink shade, substrate color and gloss, temperature. Printed directly on white or transparent materials with a 120-34 polyester fabric at room conditions an energy value of approx. 850-1250 mJ/cm², measured at a range of 250-410 nm, max. 365 nm is realistic and necessary.

Under this guideline, the Series 540 shows good overprintability, excellent adhesion and the required resistant properties. All colors have the same reactivity-level for cross-linking and only a very low inclination to overcure. So, a very efficient and uncomplicated process is guaranteed.

Stencils

As these inks are free of solvents and water, the most common emulsions and films can be used. However, because often fine fabrics are used and thin layers are required (f.e. 4-color process) high polymer emulsions or capillar films (12-15 µm) should be used.

Cleaning

Unpolymerized UV inks can be removed with all commercial solvent based cleaning agents of little polarity. UV-specific universal cleaning agents like Serie 500-URS and Serie 500-BRS are the most suitable. Removal of completely cured UV inks is time consuming and only possible using very aggressive media (decoaters).

Polluted skin must be cleaned immediately (with warm water and soap), dirty clothes must be changed.

Storage

Under normal conditions (limited change of temperature, medium temperature 20-35°C, humidity 20-70%) we guarantee a shelf life of 12 month. For metallics be valid a storage time of 6 month.

Used containers must be stored under dark conditions without any UV-light influence. It's possible that inks from production are animate and will polymerizing in the container, because the UV-crosslinking process is a chain reaction.

Packing

Series 540 are available in 1kg and 5 kg polyethylene containers. White is also offered in 2kg PE-containers.

Removed residues of ink can be supplied to the Polyolefine-recycling. Packaging containing unhardened residues of ink are subject to the special waste disposal regulations (waste disposal key (Abfallschlüssel) 55903 for Germany, waste disposal key (Sonderabfall) X(1641) for Switzerland).

Precautionary measures

Read material safety data sheet prior to processing.

The material safety data sheets according to OSHA form contain indication of hazardous ingredients, TLV-level and instructions for precautions when processing, handling and storing as well as first aid. The information given in the MSDS refers to processing as described in this technical leaflet. The statements in our leaflets have been made to the best of our knowledge and are given without any obligation. They serve to advise our business associates, **but it is absolutely necessary** to make your own printing tests under local conditions, with regard to the intended purpose prior to starting the printing job. In case of any doubts please contact our technical advisors. The application, use and processing of the products delivered by us are beyond our control. This is subject to your responsibility and there is no liability or guarantee on our part. In case of justified complaints the manufacturer can only be made liable for the countervalue of the used ink system.

Addition of not mentioned products or competitors products are on your own risk and releases Printcolor Screen Ltd. of any later demands, especially in cases of damage and loss caused by alien products.

All former leaflets are no longer valid. Oct-05