

Product Data Sheet

Screen Printing Ink

UVPO-vc-Free

UV-curing Screen Ink Range, 1-Component

APPLICATION

UV-curing screen printing inks mainly for printing on Corona pre-treated polypropylene materials (PP), such as PP double wall sheets and rigid foils. In addition, also suitable for polystyrene (PS), some types of PVC as well as paper and cardboard.

PROPERTIES

- Solvent-free UV-curing screen printing inks UVPO have a high reactivity.
- UVPO inks are delivered in a ready-to-print adjustment with medium viscosity. They rapidly cure to a glossy finish.
- The cured ink film shows good adhesion and water resistances, medium flexibility and good mechanical abrasion resistance.
- Due to the medium flexibility of the ink film suitability of UVPO for further processing such as cutting, punching, creasing should be confirmed by corresponding pre-trials.
- UVPO inks show a medium weather resistance.
- Addition of 5% hardener Additive UV/H, which mainly acts as adhesion promoter may further enhance water resistance, chemical resistance and adhesion. This especially applies when printing PP materials. When processing screen inks UVPO with hardener stackability of prints may be limited.
- Note: After UV-curing UVPO inks will continue to react (post cure effect). Therefore, final adhesion values may only be achieved after 1 – 2 days, especially with PP materials.
- Note: Manufacturers often supply PP rigid foils and PP double wall sheets already Corona-treated. However, quality of that pre-treatment may deteriorate depending on storage times and conditions. Therefore, pre-trials to confirm printability have to be carried out for each application.

COLOUR SHADES - OVERVIEW

- Mixing System: C-MIX 2000 12 colour shades for mixing of RAL, PMS and HKS colours.
- Process Inks: "180" colours 4 transparent colour shades according to ISO 2846-4.
- Special colour shades are available upon request.
- More information about available colour shades in the detailed tables in section Colour Shades.

CHOICE OF PIGMENTS AND LIGHT FASTNESS

Colour shades of UVPO ink range contain pigments with a high light fastness. Light fastness and weather resistance will reduce if thinner layers are applied or if base colours are mixed with a high ratio of white or varnish. Applied on suitable substrates screen printing inks UVPO are suitable for medium-term outdoor applications.

ADJUSTMENT FOR SCREEN PRINTING

- Screen printing inks UVPO are supplied in a ready-to-print adjustment. Generally, addition of auxiliary agents is not necessary.
- For some rare and special applications and depending on local conditions, addition of certain agents/additives is possible.
- Prior to printing, the inks should be stirred well to obtain a homogeneous dispersion of all ingredients.

AUXILIARY AGENTS

Application	Product	Addition in % by weight	Additional Information
Thinning	Additive UV/V*	Max. 10%	Standard thinner
Viscosity increase	Thickening powder	1 - 2 %	Stir with mixer
Matting	Matting powder	5 - 10%	Stir with mixer
Reactivity increase	LAB-N 551564	1 - 3%	Photoinitiator
	LAB-N 560700	3 - 5%	Photoinitiator
Flow agent	Additive UV/VM	1 - 2%	Do not overdose!
	Additive UV/N	1 - 2%	Wetting agent, also promotes flow properties.
Adhesion promoter	Additive UV/H	5%	Stir with mixer

* Thinner Additive UV/V is a reactive UV monomer, not a commercial solvent!

OVERPRINTING

Generally, it is not necessary to overprint UVPO inks with varnish. If required, however, overprinting with varnish UVPO/E50-VC-Free is possible.

BRONZE COLOURS, MIXING OF BRONZE INKS

Bronze colours with a stable shelf are available upon request.

Printers can mix bronzes themselves using bronze pastes B 75, B 76, B 77 and B 79 as well as bronze powder B 78-POWDER.

These “B” bronze pastes and “B” bronze powder are mixed with varnish UVPO/E50-VC-Free prior to processing.

Mixing ratios in parts by weight:

Gold bronze paste/powder to UVPO/E50-VC-Free = 1 : 3-4

Silver bronze paste to UVPO/E50-VC-Free = 1 : 4 - 5

- **Note:** For technical reasons these mixtures only have a pot life of approx. 6 - 8 h! Afterwards ink will thicken and become solid.
- **Note:** B bronzes are prone to oxidation (Exception B 78-POWDER). Therefore, overprinting with UVPO/E50-VC-Free is recommended.
B 78-POWDER does not tend to oxidation. The pale copper shade will not darken with time.

DRYING / UV-CURING

- UVPO inks only dry/cure under UV-radiation.
 - Suitable UV-driers with Hg medium-pressure lamps (250 – 400 nm) and an efficiency between 80 and 200 W/cm have to be used.
 - Preferably, use reflectors with a focussed radiation.
 - Ensure an even radiation (intensity/distance to the lamps) of the whole printed image.
 - Curing parameter depend on thickness of printed ink layer, colour, substrate or substrate quality and temperature as well as construction and performance of the UV drier.
 - Curing energy required depends on number of printed ink layers (check intermediate adhesion), printed layer thickness, colour and type of substrate. Hence, printers should determine the exact required energy with their own UV-drier.
 - **UV-curing energy guide values:**
(printed with 150-31 fabric, white substrate)
- | | |
|--------------------|--|
| UV-energy: | 250-300 mJ/cm²
(measured with Kühnast UV-integrator, 250 – 410 nm, max. 365 nm) |
| Belt speed: | UV-radiator: 1 x 120 W/cm: 10 - 15 m/min.
2 x 120 W/cm: 20 - 30 m/min. |
- Adhesion should only be checked several minutes after curing. Due to the post-curing process of the ink and depending on the substrate, sufficient adhesion may sometimes only be achieved after up to 48 hours.

Hardener:

Alternatively, screen inks UVPO can be processed as 2-component ink with **hardener Additive UV/H**. Addition of hardener Additive UV/H, which mainly acts as adhesion promoter may further enhance water resistance, chemical resistance and adhesion. This especially applies when printing PP materials. When processing screen inks UVPO with hardener stackability of prints may be limited.

UVPO and hardener Additive UV/H are mixed at a ratio of **ink : hardener = 20 : 1** (parts by weight).

Hardeners are sensitive to humidity. Therefore, containers always have to be tightly closed.

Pot life:

- Ink mixed with hardener may only be processed within a limited period of time (=pot life)
- **Pot life of UVPO + hardener is approx. 72 h (at 20°C).**
Higher temperatures will reduce pot life.
- We do not recommend processing the inks for longer than the pot life as adhesion and resistance properties will then continually deteriorate, even if the ink still seems to be liquid and processable.

Hardener Reaction

Basically, the increased adhesion properties influenced by the hardener are only achieved by a further chemical cross linkage reaction between ink and hardener. This cross linkage reaction depends on time and temperature (reaction time). After UV curing, prints should be stored for at least 72 hours at a temperature > 15°C.

Resistance Tests

Resistances should not be checked before the ink has fully cured/cross-linked, 24 hours after UV curing at the earliest.

SCREEN FABRIC / STENCILS

UVPO inks are formulated for printing with fabrics of 120 – 165 threads/cm. Printability and especially UV-curing properties with coarser or finer fabrics should be evaluated by corresponding trials.

All copy emulsions and capillary films suitable for solvent based and UV-curing screen inks can be used, such as our program of SunCoat or Murakami products.

CLEANING

Uncured UV inks can be removed from stencils and tools using our solvent based universal cleaning agents of the URS range.

Cleaning of cured UV inks is very time-consuming and hardly ever possible.

Note: As the acrylates contained in these UV inks may cause skin irritation, clean contaminated skin with water and soap immediately. Remove and clean contaminated clothing straightaway.

PACK SIZE

Screen printing inks UVPO are delivered in 1 and 5 litre containers. Other pack sizes are available upon request.

SHELF LIFE

In closed original containers, UVPO inks generally have a shelf life of 2 years from date of production.

For exact date of expiry, please refer to the label.

SAFETY DATA SHEETS

Read safety data sheet prior to processing.

Safety data sheets comply with Regulation (EC) No. 1907/2006 (REACH), Appendix II.

CLASSIFICATION AND LABELLING

Hazard classification and labelling comply with Regulation (EC) No. 1272/2008 (CLP/GHS).

CONFORMITY

Coates Screen Inks GmbH does not use any of the substances or mixtures to produce printing inks, which are banned according to the EUPIA (European Association of the Printing Inks Industry) exclusion policy.

Further compliance confirmations are available upon request.

ADDITIONAL INFORMATION ABOUT OUR PRODUCTS

Product data sheets: Auxiliary Agents for UV-Curing Screen Printing Inks
 Brochures: UV-Curing Screen Printing Inks
 Internet: Various technical articles are available for download on www.coates.de, section "SN-Online"

COLOUR SHADES

C-MIX 2000 BASE COLOUR SHADES Mixing system for matching of PMS, HKS, RAL colours (on white substrates) Start formulations available in data base „Formula Management C-MIX 2000“ According to colour card C-MIX 2000			
primrose	UVPO/Y30-VC-Free	violet	UVPO/V50-VC-Free
golden yellow	UVPO/Y50-VC-Free	blue	UVPO/B50-VC-Free
orange	UVPO/O50-VC-Free	green	UVPO/G50-VC-Free
scarlet	UVPO/R20-VC-Free	black	UVPO/N50-VC-Free
red	UVPO/R50-VC-Free	white	UVPO/W50-VC-Free
magenta	UVPO/M50-VC-Free	varnish	UVPO/E50-VC-Free
SPECIAL PRODUCTS: Special Colour Shades, Vanishes, Pastes Information about availability upon request			
white, highly opaque	UVPO 60/HD-VC-Free		
4 COLOUR PROCESS INKS (CMYK) According to Colour Card STANDARD 1 for screen printing inks.			
process yellow	UVPO 180/VC-Free	process black	UVPO 65/VC-Free
process magenta	UVPO 181/VC-Free	transparent paste	UVPO TP/VC-Free
process cyan	UVPO 182/VC-Free		
BRONZE INKS (ready-to-print, stable shelf life) According to Colour Card UV Metallic Effects			
Upon request.			

Matching of PMS, RAL, NCS colours and special shades upon request.

In some individual cases the product characteristics of special colour shades and modifications of this ink type manufactured upon customer request may differ from the above properties.

The statements in our product and safety data sheets are based on our present experiences, however they are no assurance of product properties and do not justify a contractual legal relationship. We provide these details to inform customers about our products and their possible applications. However, on account of various factors influencing processing of our products it is absolutely essential to carry out printing trials under local production conditions. Choice of individual ink types and their suitability for the intended application is the sole and entire responsibility of the user. We do not assume any liability for any problems of technical or process-related nature. Any liability shall be limited to the value of the goods delivered by us and processed by the user.

All former product data sheets are no longer valid.

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