

Product Data Sheet

Screen Printing Ink

SunChemical®
Coates Screen Inks

UVGS

UV-curing Screen Ink Range, 2-Component

APPLICATION

For printing on sheet glass (furniture decoration) and technical applications.

When printing on glass a clean, dust and grease-free surface is always essential. Therefore, always clean glass materials thoroughly prior to printing.

Prints on sheet glass generally have a good mechanical resistance (adhesion and scratch resistance). However, it is much more difficult to achieve a high water resistance of the prints. Depending on requirements, there are different options for processing UVGS.

There are four different options for adjusting and processing UVGS inks:

- **Option 1:**
Rapid achievement of very high resistances.
Addition of 5% adhesion promoter UVGS/HS + oven curing 140°C/20 Min. after UV-curing.
UVGS ink cured this way will be resistant to condensation as well as direct water contact for longer periods. Mechanical resistance of the wet ink film will be slightly reduced, however, will reform quickly and completely after drying.
Application: Furniture industry including bathroom furniture. Technical applications.
- **Option 2:**
Mechanical processing of the glass after printing.
Addition of 5% adhesion promoter UVGS/HS. Just UV-curing (without additional oven curing).
Initially the just cured ink film will be quite flexible. Therefore, the ink film will not chip if the sheet glass is cut or grinded immediately after printing. There will be a good mechanical resistance and, in most cases, sufficient water resistance. However, it will take approximately 4 weeks, before the final high resistance values will be achieved.
Application: Furniture industry including bathroom furniture. Technical applications.
- **Option 3:**
Rapid achievement of very high resistances without oven curing.
Addition of 5% adhesion promoter UVGS/HS, 3% hardener UVGS/HF. Just UV-curing.
If oven-curing is not possible, in addition to adhesion promoter UVGS/HS it is possible to further add hardener UVGS/HF (3%). After UV-curing the printed ink film will further cure chemically-reactive at room temperature (>20°C). The dried ink film will show good resistances after 24 h, however, final properties (hardness) will only be achieved after 72 h.
Application: Furniture industry including bathroom furniture. Technical applications.
- **Option 4:**
Water resistance and condensation resistance not required.
No addition of adhesion promoter or hardener. Just UV-curing.
Hard and mechanical resistant ink film immediately after UV-curing.
Application: Furniture industry (excluding bathroom furniture). General glass decoration in dry environments.

PROPERTIES

- Solvent-free UV-curing screen printing inks UVGS have a medium reactivity.
- Although UVGS inks can be processed as 1-component ink without addition of adhesion promoter, they are generally processed as 2-component ink with adhesion promoter.
- The cured ink film exhibits very high mechanical abrasion resistance and good chemical resistance. When processed with adhesion promoter UVGS/HS prints also show a good water resistance.
- Due to the binders screen printing inks UVGS are not suitable for outdoor applications.
- Note on multi-layer printing:
The very high level of cross-linkage of the cured ink film of UVGS inks may affect intermediate adhesion. In some cases, this can be avoided by reducing the UV curing energy when curing the lower ink layer(s). However, this must be confirmed carrying out corresponding pre-trials. At the same time, you have to check if the prints still meet the resistance requirements.
- Note on water resistance:
Water resistant adhesion on glass is achieved by a complex interaction of the components and therefore also depends on the type of glass material. If the required resistances can be achieved has to be confirmed by carrying out accurate pre-trials. Any change or deviation of the processing parameter may influence the result, especially in reference to water resistance.

COLOUR SHADES - OVERVIEW

- Mixing System: C-MIX 2000 12 colour shades for mixing of RAL, PMS and HKS colours.
- Special products: Etch imitations and frosted glass effects.
- 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 UVGS 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.

Due to the binders screen printing inks UVGS are not suitable for outdoor applications.

ADJUSTMENT FOR SCREEN PRINTING

- Screen printing inks UVGS are supplied in a ready-to-print adjustment. However, processing with addition of adhesion promoter is recommended (see page 1 "Options").
- For some rare and special applications and depending on local conditions, addition of further 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	UVGS/HS	5 %	Stir with mixer
	UVGS/HF	3 %	Only in combination with UVGS/HS

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

OVERPRINTING

Generally, it is not necessary to overprint UVGS inks with varnish.

BRONZE COLOURS, MIXING OF BRONZE INKS

Bronze colours with a stable shelf life 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 bronze powder are mixed with varnish UVGS/E50 prior to processing.

Mixing ratios in parts by weight:

Gold bronze paste/powder	to	UVGS/E50	=	1 : 3 - 4
Silver bronze paste	to	UVGS/E50	=	1 : 4 - 5

- **Note:** Depending on printing conditions, an addition of 2% photoinitiator LAB-N 560700 may be required to increase reactivity.
- **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 UVGS/E50 is recommended.
B 78-POWDER does not tend to oxidation. The pale copper shade will not darken with time.

DRYING / UV-CURING

- UVGS inks only dry/cure under UV-radiation. When processing with addition of adhesion promoter we recommend oven curing 140°C/20 Min. after UV-curing to rapidly achieve high water resistance values. (Option 1)
- 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.
- UVGS inks require relatively high energy values for UV curing.

UV-curing energy guide values:

(printed with 120-34 fabric, on transparent glass)

UV-energy: **approx. 500 – 1.000 mJ/cm²**
(measured with Kühnast UV-integrator, 250 – 410 nm, max. 365 nm)

Belt speed: **UV-radiator: 1 x 120 W/cm: 3 – 6 m/min.**
2 x 120 W/cm: 6 – 12 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 24 hours.

Adhesion Promoter / Hardener:

To achieve water resistances UVGS is processed with the following additives:

- **Adhesion Promoter UVGS/HS** (for options 1 and 2)
Addition: 5% (parts by weight)
- **Hardener UVGS/HF** in combination with adhesion promoter UVGS/HS (for option 3)
Addition: UVGS/HF 3% in addition to the 5% of UVGS/HS (parts by weight)
Hardeners are sensitive to humidity. Therefore, containers always have to be tightly closed.

Pot life:

Ink mixed with adhesion promoter/hardener may only be processed within a limited period of time (=pot life)

- **Pot life of UVGS with UVGS/HS is approx. 48 h (at 20°C).**
- **Pot life of UVGS with UVGS/HF and UVGS/HS is approx. 8 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 rapidly achieved water resistance without oven curing (option 4) influenced by the hardener UVGS/HF is only achieved after UV curing by a further chemical cross linkage reaction between ink, hardener and substrate. 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 > 20°C.

Resistance Tests

Resistances should not be checked before prints have cooled down and ink has fully cured/cross-linked.

SCREEN FABRIC / STENCILS

UVGS inks are formulated for printing with fabrics of 120 – 150 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 UVGS are delivered in 1 and 5 kilo containers. Other pack sizes are available upon request.

SHELF LIFE

In closed original containers, UVGS inks generally have a shelf life of 1 year 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 for the production of 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"

FOR COLOUR RANGES, PLEASE REFER TO NEXT PAGE.

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	UVGS/Y30	red	UVGS/R50	green	UVGS/G50
golden yellow	UVGS/Y50	magenta	UVGS/M50	black	UVGS/N50
orange	UVGS/O50	violet	UVGS/V50	white	UVGS/W50
scarlet	UVGS/R20	blue	UVGS/B50	varnish	UVGS/E50
SPECIAL PRODUCTS: Special Colour Shades, Vanishes, Pastes Information about availability upon request					
white, highly opaque	UVGS 60/HD	Upon request:			
white, extra high opacity	UVGS 60/703-HD	bronzes, stable shelf life			
black, highly opaque	UVGS 65/HD-P	etch imitations			
		matt varnishes			
4 COLOUR PROCESS INKS (CMYK) According to colour card STANDARD 1 for screen printing inks					
Upon request					

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

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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