SunChemical®
Coates Screen Inks

UV AUXILIARY AGENTS (HM) ADDITIVES

INTRODUCTION

Generally UV-curing screen printing inks are supplied in a ready-to-print-adjustment.
There are only a few UV screen ink ranges which can optionally be processed as 2-component ink with hardener.
We also offer certain UV ink types formulated as 2-component inks (mandatory hardener addition).
Depending on specific requirements addition of certain auxiliary agents or additives may be required for some individual applications.
Prior to adding any auxiliary agent to UV-curing screen inks, please always refer to the relevant information listed in the product data sheets of the individual ink ranges.

Auxiliary agents/additives for UV-curing screen printing inks offered by Coates Screen Inks GmbH:

I.	**REACTIVITY INCREASE**	• PHOTOINITIATORS
II.	**ADJUSTMENT OF VISCOSITY**	• UV THINNERS • THICKENING POWDER
III.	**HARDENERS/ADHESION PROMOTERS**	
IV.	**SURFACE & FLOW PROPERTIES**	• FLOW AGENT • ANTISTATIC AGENT • ANTI-FLOATING AGENT • MATTING POWDER
V.	**SPECIAL PRODUCTS**	
VI.	**CLEANING AGENTS**	

GENERAL INFORMATION ABOUT USE OF THESE AUXILIARY AGENTS:

- **All information about addition/dosage is in % by weight!**
- Only small amounts are added.
- Overdosage will always cause problems.
- The additions recommended are product-related.
- Always start with very small amounts and determine the most effective addition carrying out pre-trials under local conditions.
- In any case it is essential to confirm that addition of auxiliary agents/additive does not interfere with processing properties of the ink and does not affect any further processing or final qualities of the printed product.

I. REACTIVITY INCREASE

The quality of UV-curing depends on various factors:

- Efficiency of UV-curing equipment.
- UV-radiation, depending on efficiency of UV-lamps, printing and belt speed.
- Thickness of printed ink layer, colour shade.
- Type of substrate, surface properties and substrate colour.

Each individual UV ink range requires a specified UV energy for curing. Depending on above mentioned factors it may be required to speed up the UV-curing reaction in some rare cases. If required, curing (polymerisation/effective curing) of UV inks can be enhanced by adding sensitizer or photoinitiator solution.

LAB-N 551564 Photoinitiator Solution.

Characteristics:	Clear, slightly yellowish liquid, medium viscosity. Highly effective non-yellowing mixture of photoinitiators.
Effect:	Increases final curing of colour shades and opaque colour shades.
Application:	Stir with mixer, suitable for all UV inks.
Addition:	1 – 3 % max.
Overdosage:	Increased surface hardness resulting in overprintability problems.

LAB-N 560700 Photoinitiator Solution.

Characteristics:	Clear, slightly yellowish liquid, low viscosity. Non-yellowing mixture of photoinitiators.
Effect:	Increases reactivity of UV-inks. Improves curing, especially curing of colour shades. Non-yellowing, therefore suitable for white inks and varnishes.
Application:	Stir with mixer, suitable for all UV inks.
Addition:	1 - 3 % (recommendation), max. 5 %.
Overdosage:	Increased surface hardness resulting in overprintability problems.

Additive UV/S Sensitizer.

Characteristics:	Clear, slightly yellowish liquid, medium viscosity. Mixture of photoinitiator (65%) and reactive resin (35%)
Effect:	Increases reactivity of UV-inks. Improves curing, surface hardness and chemical resistance.
Application:	Stir with mixer, suitable for all UV inks (except MTR and PDX).
Addition:	3 - 5 % (recommendation), max.10 %.
Overdosage:	Additions of more than 10 % may result in over-curing of the inks. Over-curing causes overprintability problems, stamping and cutting problems and also changes of colour shade.

LAB-N 560940 Reactive Resin.

Characteristics:	Clear, colourless liquid, high viscosity.
Effect:	Increases reactivity of UV inks due to stronger cross-linkage of the ink. Improves chemical resistance.
Application:	Stir with mixer, suitable for all UV inks (except MTR and PDX
Addition:	Up to 5 %.
Overdosage:	Increased surface hardness resulting in overprintability problems.

II. ADJUSTMENT OF VISCOSITY

Prior to adjusting viscosity of UV-curing screen inks, please always refer to the relevant information listed in the product data sheets of the individual ink ranges.
Generally UV curing screen printing inks are supplied in a ready-to-print adjustment.
Viscosity adjustment of UV-inks can be changed to a limited extent by addition of reactive thinner or thickening agent.

THINNER

UV thinners partially consist of monomers, a liquid component of UV-curing inks. These are not volatile organic solvents as in solvent based inks. During UV-curing the UV thinners polymerise in the ink film and become a component of the cured/dried UV ink.
UV thinners can only be added to a limited extent. Excessive addition will strongly interfere with the curing process. Therefore do not exceed the recommended maximum additions!

Additive UV/V	**Universal Reactive Thinner.**
Characteristics:	Clear, colourless non-yellowing liquid, low viscosity.
Effect:	Reduces viscosity of UV inks.
	Reacts with the ink film, does not evaporate (no solvent/VOC)
Application:	Stir with mixer, suitable for all UV inks (except MTR and PDX).
Addition:	3 - 10 % max.
Overdosage:	Additions of more than 10 % will reduce reactivity and curing of inks and change colour shades.

MTR/V	**Special Reactive Thinner.**
Characteristics:	Clear, colourless non-yellowing liquid, low viscosity.
Effect:	Reduces viscosity of UV inks.
	Reacts with the ink film, does not evaporate.
Application:	Stir with mixer, suitable for MTR and PDX.
Addition:	3 - 10 % max.
Overdosage:	Additions of more than 10 % will reduce reactivity and curing of inks and change colour shades.

VISCOSITY INCREASE

Addition of thickening powder will increase viscosity of UV-inks. This very light powder should be stirred with mixer or dissolver effectively. Manual stirring may cause an uneven distribution (agglomeration) in the ink and streaks and smears in printed image.

Thickening Powder:

Characteristics:	White, fine powder.
Effect:	Increases viscosity and thixotropy of UV inks.
	Mixing with mixer or dissolver is recommended.
Application:	Suitable for all UV inks.
Addition:	1 - 3%.
Overdosage:	Deterioration of flow and printability.

III. HARDENERS/ADHESION PROMOTERS

UV inks polymerize under UV-radiation. Contrary to solvent-based inks they result in very resistant and chemical resistant ink films without hardener addition and depending on the binders used.
In some cases, however, even UV-inks have to be processed as 2-component ink with hardener or adhesion promoter, mostly to achieve better adhesion on difficult substrates.

ADHESION PROMOTER		HARDENER	
UV/HA	Adhesion promoter for metal substrates	**UV/H**	Hardener
Application:	Alternatively in UVP	Application:	Alternatively in UV/K, 80UV, UVE
Reaction temperature:	none	Reaction temperature:	>20°C
Addition:	5 %	Addition:	5%
Pot life:	none	Pot life:	6 - 8h
UVGS/HS	Adhesion promoter for glass ink	**UVGS/HF**	Hardener for glass ink
Application:	UVGS	Application:	UVGS
Reaction temperature:	>20°C	Reaction temperature:	>20°C
Addition:	5 %	Addition:	3 %
Pot life:	72 h	Pot life:	8 h
SVC/H	Adhesion promoter for glass ink		
Application:	SVC		
Reaction temperature:	>20°C		
Addition:	5 %		
Pot life:	6 - 8h		
ST 399	Adhesion promoter for glass ink	**ST 395**	Hardener for glass ink
Application:	VTGL	Application:	VTGL
Reaction temperature:	>20°C	Reaction temperature:	>20°C
Addition:	3 - 5%	Addition:	3 %
Pot life:	6-8h	Pot life:	2 - 4h

IV. SURFACE AND FLOW PROPTERIES

There is a great variety of substrates with different surface properties that can be printed with UV inks. Occasionally wetting problems or flow problems may occur. The following additives can be used to avoid or reduce these undesired effects.

FLOW AND WETTING AGENTS

Additive UV/N **Wetting Agent.**
Characteristics: Clear, colourless liquid, low viscosity. Contains silicone.
Effect: Improves wetting on difficult substrates.
Application: Stir with mixer, suitable for all UV inks.
Addition: 1 – 2%.
Overdosage: Impairs ink adhesion and overprintability.

Additive UV/VM **Flow Agent.**
Characteristics: Cloudy, whitish liquid, low viscosity. Contains silicone.
Effect: Improves flow and slip properties, counteracts orange peel.
Application: Stir with mixer, suitable for all UV inks.
Addition: 1 – 2%.
Overdosage: Surface lubrication, reduced intermediate adhesion.

ANTISTATIC AGENT

Static electricity is a frequent problem when printing on plastic materials. When screen printing static electricity often results in ink splashes (webbing) in and around the printed image.
There are various possibilities to avoid or reduce static electricity:

- Sufficient humidity (>60 % r.h.) in the press room.
- Ionising units to achieve sufficient conductivity of material surfaces and environment.
- Adding antistatic agents to inks.

Wiecostat-15 **Antistatic Agent.**

Characteristics:	Transparent liquid.
Effect:	Reduction/elimination of webbing in the image. Improvement of electrostatic discharge from the UV ink.
Application:	Stir with mixer, suitable for all UV-inks.
Addition:	1 - 5 %.

ANTI-FLOATING AGENT

The colour shades of each individual UV ink range can be mixed at any ratio.
When mixing colour shade, mostly blue, violet and black with white at a certain ratio, sometimes caused by certain physical reactions (separation) white pigments float to the surface of the ink. Sometimes these floating white pigments will then show in the printed image. Addition of anti-floating agent will solve/improve this problem.

LAB-N 560601 **Anti-Floating or Dispersing Agent.**

Characteristics:	Clear, slightly yellowish liquid, high viscosity.
Effect:	Reduces floating/separation of pigments in problematic mixtures of colour shades. Improves colour shade stability during printing.
Application:	Stir with mixer, suitable for all UV inks.
Addition:	Up to 2 %.
Overdosage:	Surface lubrication, reduced intermediate adhesion.

GLOSS REDUCTION / MATTING

The possibility of gloss reduction (matting) of UV inks is limited. Addition of matting powder will increase layer thickness and cause a reduction of reactivity.
Therefore always carry out corresponding pre-trials to confirm the suitability of matting powder for individual applications.
This very light powder should be stirred with mixer or dissolver effectively. Manual stirring may cause an uneven distribution (agglomeration) in the ink and streaks and smears in printed image.

Matting Powder

Characteristics:	Very light, whitish powder.
Effect:	Gloss reduction (matting) of glossy UV inks.
Application:	Stir with mixer, suitable for UV inks.
Addition:	3% - 8 %.
Note:	It is absolutely essential to mix matting powder into the ink using a suitable mixer, dissolver or agitator (dispersion). Otherwise the printed ink film may show a rough surface with different degrees of gloss. After addition of matting powder, also check if the matted ink film meets the required properties.

V. ADDITIVES FOR SPECIAL PRINTING APPLICATIONS

IMPROVEMENT OF LIGHT FASTNESS

Additive UV/LS (light-stability agent).

Characteristics:	Clear, yellowish liquid, low viscosity.
Effect:	Increased sun-light protection and deceleration of destructive degradation processes caused by UV-radiation, especially for clear varnishes.
Application:	Stir with mixer, suitable for all UV-inks and UV-varnishes.
Addition:	3 - 5%.
Overdosage:	Flow problems and reduction of reactivity.

STABILISER FOR METALLIC COLOUR MIXTURES

LAB-N 350842 (Stabiliser).

Characteristics:	Clear, slightly yellowish liquid, low viscosity.
Effect:	Longer pot-life of UV metallic colour mixtures. Deceleration of premature ink polymerisation.
Application:	Stir with mixer, suitable for all UV inks.
Addition:	1 - 2%.
Overdosage:	Reduction of reactivity and curing.

VI. CLEANING AGENTS

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.

Universal cleaning agent URS

Characteristics:	Clear liquid, solvent mixture.
Effect:	Removal of dried ink residues.
Application:	Cleaning un-cured ink residues form stencils and tools with cleaning rags saturated with URS. Ready-to use, do not dilute.
Note:	Only use URS wearing suitable protective clothing (PPE) such as solvent-resistant protective gloves, googles and clothing. Read safety data sheet prior to processing!

Additional Information:

SAFETY DATA SHEETS

Read safety data sheets of each product 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:	UV-Curing Screen Printing Ink Ranges
Brochures:	UV-Curing Screen Printing Inks
Internet:	Various technical articles are available for download on www.coates.de, section “SN-Online”

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