



Coates Screen

Product Data Sheet

ADDITIVES FOR PAD PRINTING

Pad printing inks of Coates Screen Inks GmbH have been developed for world-wide use in various pad printing systems. Due to the diversity of the pad printing process it is impossible to deliver such inks in ready-to-print adjustments. Therefore use of various additives to adjust the pad printing inks to the different environmental conditions and printing requirements is necessary. Properties and application of the most important additives for pad printing will be described in the following.

THINNERS

Thinners are used to adjust the ink to a ready-to-print consistency. Amount of thinner used depends on ink type, printing speed, environmental conditions, plate depth and the like.

- **ADDITIVE A**

Universal thinner for pad printing inks. Due to its balanced mixture of solvents Additive A is the first choice for all “regular” pad printing applications. Additive A is suitable for all pad printing inks of the Coates Screen GmbH range.

- **ADDITIVE U**

This is an alternative to Additive A if cyclohexanone and/or aromatic hydrocarbons in the thinner are not wanted. Technical properties are comparable with Additive A. Additive U is particularly used with ink series such as TP E-HF, which are formulated without cyclohexanone and aromatic hydrocarbons.

- **ADDITIVE B**

This universal thinner is suitable for quicker printing speeds. Like Additive A, Additive B is suitable for all our pad printing ink types.

- **ADDITIVE C**

Extremely quick thinner allowing processing of pad inks on very quick running printing machines. Additive C is also suitable for all our pad printing inks.

- **THINNER VD 60**

This thinner is suitable for slower printing speeds. Also being a universal thinner VD 60 is suitable for all pad printing inks of our range.

- **THINNER VD 10**

Mild special thinner for sensitive substrates. In combination with ink type TP 249 thinner VD 10 is especially suitable for printing onto plastics with a tendency to tension cracks (e.g. polystyrene form parts). VD 10 is not suitable for 2-component pad printing inks (except TP 218/GL).

In addition thinner VD 10 may also be used as mild cleaning agents for faulty prints.

- **THINNER VD 40**

VD 40 is an “aggressive” thinner, which may improve adhesion of pad printing inks on soluble substrates. There will be no improvement of adhesion on non-soluble plastics (e.g. polyolefines, PE, PP). VD 40 is suitable for all Coates Screen Inks GmbH pad printing inks.

RETARDERS

Retarders are slowly evaporating thinners used for slow printing speeds or for printing of fine details (process printing). It is often better to add retarder to the universal thinner instead of using it alone.

- **TPD**
Universal retarder TPD shows high solubility and a strong retarding effect. TPD is suitable for all our pad printing inks.
- **TPV**
Retarder TPV shows low solubility and strong retardation. Just like thinner VD 10 it can be used for printing onto plastics with a tendency to tension cracks in combination with ink type TP 249. This thinner is not suitable for 2-component inks (except TP 218/GL).
- **RETARDER PASTE LAB-N 111420/VP**
Contrary to the liquid retarders retarder paste LAB-N 111420/VP does not thin the ink, but still shows a retardation effect. LAB-N 111420/VP is miscible with all ink systems. We recommend an addition of 5-10%.

SUMMARY THINNERS AND RETARDERS BY EVAPORATION RATE

The evaporation rate of a thinner or retarder in the mixed ink also depends on the solvating power of the individual ink types. Thinners with a high solubility will be retained for a longer period than thinners with a low solubility.

The higher the amount of the solvent addition the longer the period of time until it evaporates and the ink physically dries. The following summary indicates the relative evaporation rates in relation to Additive A.

Example: VD 60 evaporates 5 times slower than Additive A, Additive B twice as quick than Additive A. This example is intended to be a rough guideline.

Thinner		Evaporation Rate	
Additive C		0,25	quick
Additive B		0,5	
VD 10		0,6	
Additive A / VD 40		1	
VD 60		5	
TPD		25	
TPV		30	slow

- **CLEANING AGENT URS**
URS is a cleaning agent with high cleaning power.
This cleaning agent is used for cleaning of clichés, ink feeders, machine parts and tools.

HARDENERS

Hardeners react chemically with suitable ink systems. This reaction is initiated as soon as the hardener is mixed with the ink. Therefore 2-component systems consisting of ink and hardener ink can only be used for a limited period of time (pot life).

Even if the mixed ink still seems to be processable after this time it should be substituted by new ink in order to guarantee adhesion and resistance values to correspond to the requirements.

Reaction of ink with hardener can take up to 6 days. Even though the ink film seems to be dry a short time after evaporation of solvents (physical drying) the chemical cross linking process still continues. This chemical reaction requires the minimum temperatures as described in the following.

Resistance values should not be checked prior to termination of the cross linking process (see data sheets of the individual ink types).

The hardener containers should always be tightly closed, as hardeners tend to react with humidity and become unusable.

- **HARDENER TP 219**
Cross linking component for ink ranges TP 218, TP 247, TP 253, TP 260, TP 267, TP 273, TP 300, TP 305, TP 307. Reacts at temperatures starting from 10°C. Slight tendency to yellowing. Therefore it should not be used for outdoor applications.
- **HARDENER TP 219/N**
Cross linking component for ink ranges TP 247, TP 253, TP 273, TP 300, TP 307. Curing temperature above 20°C, does not tend to yellow and is suitable for outdoor applications.
- **HARDENER TP 219/N-00**
Cross linking component for ink ranges TP 267, TP 305. Curing temperatures above 20°C, does not tend to yellow and is suitable for outdoor applications.
- **HARDENER TP 219/GL**
Cross linking component for ink range TP 218/GL. Suitable for air and oven curing. Cured prints show good water resistance and relatively good chemical resistance.
- **HARDENER TP 219/02-GL**
Cross linking component for ink range TP 218/GL. Air and oven curing; Prints show very good chemical resistance, especially if cured at higher temperatures.
- **HARDENER TP 219/03-GL**
Cross linking component for ink range TP 218/GL. Suitable for air and oven curing; air dried cured prints show very good water and chemical resistance.

FLOW AGENTS

Problems occurring may be bubbles, pinholes, orange peel or the like on the surface of the pad printing ink film. In order to avoid such undesired effects sometimes certain additives, so-called flow agents have to be mixed into the pad printing ink.

However, the flow agents should be added carefully and the amounts indicated below should not be exceeded. Utmost attention is required if inks containing silicone-containing flow agents will be overprinted or laminated.

In any case it is important to stir the flow agent into the ink very thoroughly in order to achieve homogenous distribution.

- **FLOW AGENT VM1**
This is a silicone-containing flow agent with a broad field of applications. It is suitable for all ink types except water based ink types. Eliminates flow problems such as orange peel, bubbles, pinholes or the like in the pad ink film.

Addition approx. 1 – 5 %, not over-printable.
 - **FLOW AGENT VM2**
Basically the same effect than flow agent VM1. This additive is more concentrated and thus more effective.

Flow agent VM2 should be used if flow agent VM1 does not achieve a satisfactory result. Dosage should not exceed 0.3 to 0.5 %. Only in exceptional cases addition could be up to 2%. In reference to use and limitation of overprintability the same information as given for VM1 applies.
 - **FLOW AGENT VM3**
Use of flow agent VM3 is only suitable if the ink does not contain any previous addition of silicone-containing flow agents (VM1 or VM2). This flow agent has proven to be successful if added to 2-component inks TP 218/GL and TP 218, however it can also be used for all other pad printing ink types of our sales program.

Addition is approx. 1 - 5 %. Higher amounts are not suitable and will not improve results.
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ANTI FLOATING AGENT

Floating is an effect sometimes occurring when producing mixed colour shades. This effect e.g. often appears when mixing inks with a high degree of white with pad printing inks containing pigments with small particle size and a low specific weight (e.g. mixtures of white printing ink with blue and black).

During drying of the printing ink film the pigments separate resulting in irregular distribution of the colorants in form of honeycomb cells or stripes. There might also be an even floating of one pigment, so that the surface of the pad ink film shows another colour than the bottom side. This is e.g. often experienced when pad printing onto transparent materials.

In such cases addition of approx. 3 – 5% of the anti floating agent may help.

As the cause of floating may be due to very different reasons, the pad ink manufacturer cannot basically exclude this effect.

ANTI STATIC AGENTS

Static charge is often quite problematic when printing onto plastics. Static charge mainly shows by splashes in the image. The static charge is mainly due to separation of surfaces resulting in separation of charge. The excessive positive or negative charge particles on the surface cannot discharge on a non-conducting material (plastic) or on an isolated conductor and will stay in for of static or closed electricity.

In order to avoid static charge the surface of the materials and the surrounding area have to be sufficiently conductive. Elimination of static charge is best achieved by sufficient humidity (approx. 55%) as this will reduce surface resistance. Another possibility is the use of anti static agents, offered in two different types.

▪ TPC

Anti static agents in liquid form, which can be added to all our inks in order to increase conductivity of the pad printing ink.

Addition approx. 1-2%.

ANTISTATIC PASTE LAB-N 111420

Antistatic paste LAB-N 111420 is a slightly yellow, clear and gel-type paste, which can be processed well. It is suitable for all ink types of our range and is stirred well into the un-thinned ink.

Addition is approx. 5-10% and depends on the amount of static charge.

THICKENING POWDER

Thickening powder is an auxiliary agent allowing a more thixotrope adjustment of the pad printing inks. This may especially become necessary when printing fine details, letters, process lines etc.

The thickening powder is a slightly powderish substance. Addition to the pad ink is approx. 2 – 3 %. This will generally result in sufficient thixotropy and thickening.

It is important that the thickening powder is stirred into the ink thoroughly. Suitable mixers are recommended.

If the thickening powder is insufficiently mixed into the ink the ink film will show a rough, dull and mat surface.

MATTING POWDER

The matting powder has a similar appearance than the thickening powder. However, it is used to mat the pad printing inks and not to increase thixotropy. Depending on addition the degree of gloss of the printing ink film is increased, but viscosity is increased at the same time.

Depending on the requested degree of gloss addition of approx. 3 to 6 % is possible.

In order to achieve good dispersion of the powder in the ink use a suitable mixer.

It is not always possible to mat oxidation drying inks, 2-component inks or UV-curing inks with matting powder. If viscosity of the inks allows this, here addition would have to be a lot higher.

If using matting powder tests have to be carried out in order to determine if the matted ink film still corresponds to the other requested requirements.

ADHESION PROMOTER PP

Adhesion promoter PP is an adhesive ground, especially for polypropylene. Use of adhesive agent will eliminate the necessity of pre-treatment by flaming or Corona. For other plastics or metals pre-tests are required. Adhesion promoter PP can be applied by spraying, immersing or brushing. However it should only be applied in thin layers, as a thick layer will be ineffective.

Substrates treated with adhesion promoter PP can be coated or printed one minute after application or even after several months.

ADDITIVES TO IMPROVE ABRASION RESISTANCE

- **LAB-N 560469**
Additive in powder form to improve abrasion resistance. Add while stirring. Addition is 1-3%. If addition is higher there will be a significant decrease of gloss.
- **LAB-N 561644 + LAB-N 561645**
Combination of liquid/solids. Achieves very good abrasion resistances.

Additions: LAB-N 561644 0,5-1,0% (liquid)
LAB-N 561645 1,0-3,0% (solid)

Add while stirring. No gloss reduction with a 1% addition. Higher addition may slightly reduce gloss.

GENERAL

Users have to decide in each individual case which additive to use. Use of additives is suitable in certain circumstances, however just like with medicines over-dosage of auxiliary agents may have an adverse effect. Therefore the most favourable addition amount has to be determined in each case under the local circumstances.

Information given above is only a guideline of measurements you can take to eliminate pad printing problems. However, they are to be understood as non-binding advice only.

CLASSIFICATION

Read material safety data sheets prior to processing.

The material safety data sheets according to Regulation (EC) No 1907/2006 (REACH) contain classification according to preparations directive (1999/45/EC) as well as instructions for precautions when processing, handling and storing as well as first aid.

SUMMARY ADDITIVES

	Form	Addition	Add using	Over-printable
Flow Agent / Defoamer				
- VM 1	liquid	1-5%	high-speed mixer	No
- VM 2	liquid	0,5-2%	high-speed mixer	No
Flow Agent				
- VM 3	liquid	1-5%	high-speed mixer	Yes
Anti Floating Agent	liquid	3-5%	10 min. dissolver	Yes
Anti Static Agent				
- TPC	liquid	1-2%	high-speed mixer	Yes
- LAB-N 111420	paste	5-10%	manual addition	Yes
Thickening Powder	solid / powder form	2-3%	10 min. dissolver	Yes
Matting Powder	solid / powder form	3-5%	10 min. dissolver	Yes
Additives used to improve Abrasion Resistance				
- LAB-N 560469	solid / powder form	1-3%	10 min. dissolver	No
- LAB-N 561645	solid / powder form	1-3%	10 min. dissolver	limited
- LAB-N 561644	liquid	1-3%	10 min. dissolver	No

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. 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 job. - All former product data sheets are no longer valid. FEBRUARY 2013 – VERSION No. 9

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