

**Harald Tröger**  
Laboratory:  
Pad Printing



# PROPER HANDLING

# OF ADDITIVES FOR PAD PRINTING INKS

Pad printers have to meet constantly increasing requirements. In addition to continual improvement of pad printing inks it is also essential to offer a large variety of additives for these ink types, which will quickly solve any possible problem during a printing job.

## FUNCTION OF ADDITIVES

Basically the purpose of additives is to add "spices" to a pad ink. Thus only small amounts are necessary. Addition depends on type of auxiliary agent as well as on the desired effects. Usually addition is approx. 0,5% to 5,0%.

According to their different effects these auxiliary agents are classified in different groups:

- **Surfactants**  
(wetting agents, dispersing agents)
- **Matting and thixotropic agents**
- **Defoamers**
- **Flow agents**
- **Stabilizers and UV-absorbers**

## STABILIZERS AND UV-ABSORBERS

These additives reduce surface tension so that good wetting of pigments and fillers is achieved. This is important during ink manufacture in order to counteract flocculation after the dispersion process. In addition use of wetting agents will achieve good wetting of the substrate.

## MATTING AND THIXOTROPIC AGENTS

### → MATTING AGENTS:

Very light, white substances in powder form used to reduce or adjust the gloss to customer specifications.

The more matting agent is added the matter the ink will be.

*addition of 2,5% = satin gloss  
(approx. 20 gloss units)*

*addition of 5,0% = matt  
(approx. 5 gloss units)*

### → THIXOTROPIC AGENTS:

Thixotropic agents look very similar to matting agents (Watch out!: risk of mix up!) By chemical construction of intermolecular forces thixotropic agents result in an apparent viscosity increase of the pad printing ink. By simply stirring the pad inks this viscosity increase is reversed and the original consistency of the pad printing ink is restored. This effect is generally known as thixotropy.

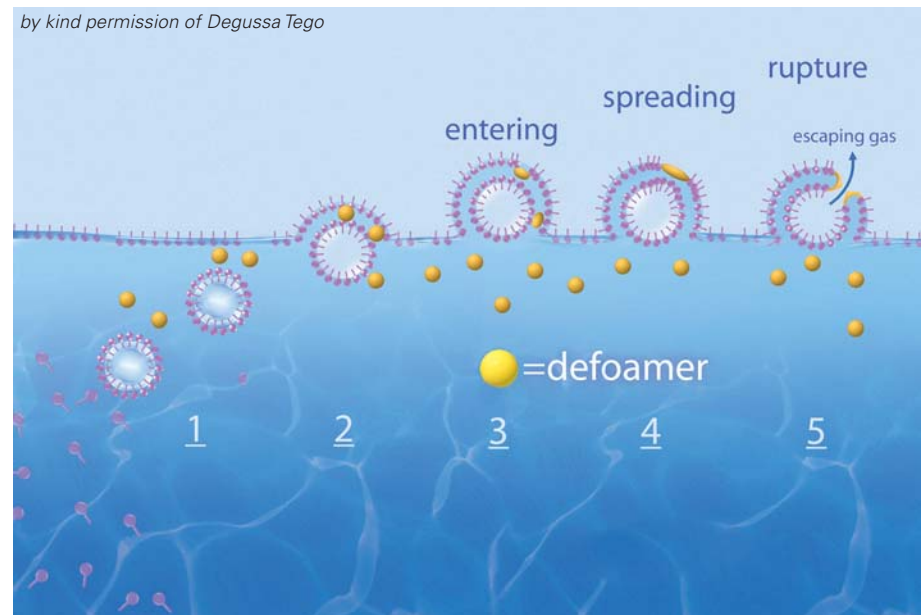
Use of thixotropic agents is especially important when processing 4-colour process inks or when printing fine details or lines. An addition of approx. 2-3% to the formulation will result in sufficient thixotropic properties.

## DEFOAMERS / DEGASIFIERS

These substances are used to stop foaming during the dispersion process (macro foam) and also to prevent or to quickly remove small air bubbles during the printing process (micro foam). This way surface problems can be avoided. The foam stabilisation can be achieved because pad printing inks are liquids containing surfactants (similar to water with detergent). Due to their non-polar property (insolubility) defoamers can enter into the layer at the interface between ink and air and cause the air bubble to rupture.

## EFFECT OF DEFOAMERS

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Most common surface problems are so-called pinholes caused by micro-foam when printing solvent-based and UV-curing pad printing inks. In these cases we recommend addition of VM2.

Print without pinholes



50-fold magnification



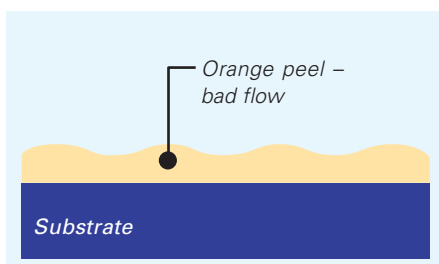
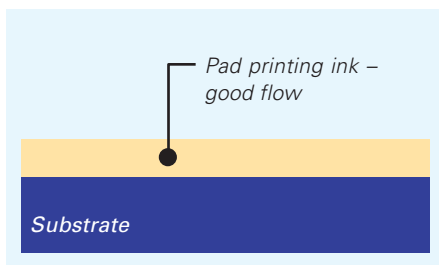
Print with pinholes

Addition of low volatile solvents, e.g. TPD is also recommended in some cases.

## FLOW AGENTS

Sometimes flow problems occur during pad printing causing orange peel or pinholes. Such problems can be avoided by addition of flow agents. These surfactants reduce surface tension of the pad printing ink and thus improve the flow of the pad ink.

As a side effect flow agents increase floatability and reduce over-printability of the substrate. If printed parts require overprinting with another colour or varnish and you cannot do this within a few hours after the first print, we recommend use of VM 3. Otherwise VM 1 and VM 2 can be used.



## STABILIZERS AND UV-ABSORBERS

Stabilizers and UV-absorbers are very complex substances which counteract the natural decomposition of the binder system. Use of these substances will increase weather resistance, however, depending on the ink type you will never have complete protection. It is very important to choose a pad printing ink containing high quality weather resistant binders.



## ADDITION AND DOSAGE OF ADDITIVES

Generally the additives offered by Coates Screen Inks GmbH should be mixed with the pad printing ink using a dissolver or mixer in order to achieve a homogeneous distribution of the agents. The mixer has to have the right size for the ink container. The shearing speed is ok if you encounter the so-called "Doughnut effect" during the mixing. This effect is generally achieved at mixing speeds of 25 m/sec.

It is also very important to exactly measure the quantities as listed in our product data sheet "Additives for Pad Printing". Of course our laboratory experts will always be glad to be of assistance.

Above measures as well as well-aimed application of these substances will result in optimal effects of the additives without any undesired side-effects.

SUMMARY ADDITIVES				
	FORM	ADDITION	ADD USING	OVER-PRINTABLE
<b>FLOW AGENT/DEFOAMER</b>				
VM 1	liquid	1-5%	high-speed mixer	no
VM 2	liquid	0,5-2%	high-speed mixer	no
<b>FLOW AGENT</b>				
VM 3	liquid	1-5%	high-speed mixer	yes
<b>ANTI FLOATING AGENT</b>				
	liquid	3-5%	10 Min. dissolver	yes
<b>ANTI STATIC AGENT</b>				
TPC	liquid	1-2%	high-speed mixer	yes
LAB-N 111420	paste	5-10%	manual addition	yes
<b>THICKENING POWDER</b>				
	solid /powder form	2-3%	10 min. dissolver	yes
<b>MATTING POWDER</b>				
	solid /powder form	3-5%	10 min. dissolver	yes
<b>ADDITIVES USED TO IMPROVE ABRASION RESISTANCE</b>				
LAB-N 560469	solid /powder form	1-3%	10 min. dissolver	yes
LAB-N 561645	solid /powder form	1-3%	10 min. dissolver	limited
LAB-N 561644	liquid	1-3%	10 min. dissolver	yes

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