SIEGWERK

Narrow Web

NEWS FOR LABEL PRINTERS

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SICURA PLAST NUTRITEC – The popular UV offset series

Process: UV offset | Application: Plastic substrates, labels
Series: SICURA PLAST NUTRITEC

Low migration, almost no odour, excellent adhesion to plastic substrates – due to its outstanding properties, a popular series.

SICURA PLAST NUTRITEC is a new development that has already proven itself in the market. It is being used for **applications in the food and cosmetic areas.** The user-friendly inks cure perfectly. Its good adhesion to non-absorbent materials makes this a popular UV offset series for self-adhering labels, sleeves and IML. The SICURA OPV series high pigmentation, low dot gain and excellent overprint capacity with low migration inks are also highly valued. SICURA PLAST NUTRITEC is also an excellent choice for combination printing with the SICURA FLEX 39-10 LM UV flexographic series.

NEW

UV flexographic opaque white with outstanding properties

Process: UV flexographic printing
Application: Pre-print white for labels, tubes
Product number: 81-010328-3
White F RAD Label 0008

Excellent coverage, low viscosity, smooth surface, outstanding workability and minimal tendency to yellowing.

This newly developed UV flexographic opaque white features high opacity, a pure white colour and a minimal tendency to yellowing. Its high opacity at a low viscosity is achieved by the combination of special raw materials with a high-coverage pigment. At the same time, the new recipe allows the layer of ink to coat the ground with a smooth surface and no pinholes. Layer thicknesses of 5–7 µm are easily achieved. (Recommended anilox rollers: min. 12 cm^3/m^2, max. 22 cm^3/m^2.)

Sensational LED-UV relief varnish

Process: LED UV screen printing
Application: Labels
Series: SICURA LEDTec SCREEN

A new development for LED-UV printing. No yellowing, outstanding drying results, relief height of up to 250 µm.

For the new LED-UV technology, the ink engineers at Siegwerk have developed a new relief varnish. Its primary purpose is to print the raised warning symbols on packaging with hazardous contents. Packaging like this must be labelled throughout Europe with a raised symbol for the blind and visually impaired (EN Standard 272 or ISO 11683). The packaging manufacturers prefer to apply the warning symbol as a label that is screen-printed using clear relief varnish. The relief varnish is **flexible, scratch-resistant and has a shiny surface.**

Topic in Brief

LED-UV – Major success at Labelexpo

During Labelexpo (24–27 Sept. 2013), a Gallus LED-UV combination printing machine was in full action at the Siegwerk stand, producing top quality labels.

The visitors were extremely interested. Everyone who is in the process of deciding on which narrow web machines to invest in will have to give LED-UV technology serious consideration. From start to finish, the drying system with modern LED-UV emitters and the LED-UV inks from Siegwerk **(SICURA FLEX LEDTec and SICURA SCREEN LEDTec)** impressed everyone. The technology is mature and has major advantages:

- **Long LED-UV emitter service life**
- **Low energy costs**
- **Simple operation**
- **Low migration ink systems are undergoing intensive development.**

Siegwerk produced labels on a LED-UV printing machine from Gallus.

Health Safety Environment

Use caution when handling UV inks

Recently, the press reported that UV inks can cause 2nd degree burns of the skin

When handled properly, UV inks are not dangerous. However, direct contact with them can result in skin and eye irritation. This is why UV inks and varnishes must be handled with care by properly trained staff. Avoid contact with skin, eyes and clothing. To protect skin and eyes, the safety data sheets specify that suitable chemical protection gloves and protective goggles must be worn. Before breaks and at the end of work, hands must be washed. Never use solvents to do this. After washing, we recommend using skin care products.

Splashes of UV ink do not dry. Therefore they should be wiped away immediately with a disposable cleaning cloth. Also take care that UV inks are not deposited on machine parts and on other machines or objects.

If work clothing or skin becomes contaminated, remove the clothing immediately and thoroughly wash the skin using plenty of water and soap. Wash contaminated clothing before wearing again. Follow these simple rules to prevent problems with UV inks and varnishes.

N-Vinylcaprolactam (NVC) new addition to EuPIA exclusion list

NVC is a commonly used reactive diluent for UV-curing inks. According to the latest studies, it can cause damage to organs through prolonged or repeated exposure.

This new classification will also apply to any mixture containing 10% or more of the substance. NVC is also included in some Siegwerk UV inks. As a member of the European Association of Printing Ink Manufacturers EuPIA, Siegwerk will substitute the substance in the relevant inks with suitable alternatives within the prescribed time-limit and immediately incorporate the changes in its Safety Data Sheets and on the product labels.

OSC On-Site Consulting ...

... a proven Siegwerk service now available to narrow web customers.

Siegwerk customers have always been able to benefit from a number of useful services that go beyond the supply of printing inks. Some of these services are free of charge, and some are not. With on-site consulting, Siegwerk meets the needs of many customers who would like their processes analysed on site to determine savings potential and optimisation measures. Concept development for batchers, ink room management and colorimetry training courses – these are only three examples of the OSC services that Siegwerk offers its customers.

The Siegwerk OSC service team comprises of specialists

who can systematically **examine printing processes in detail, present proposals for boosting productivity** and advise and support customers as required. Theoretical and practical training courses that are carried out at Siegwerk or directly on customer premises supplement the OSC program.

Contact your Siegwerk application technician, who will be pleased to set up contact with a Siegwerk OSC specialist for you. (Learn what customers say about OSC **here**)

Well Worth Knowing

How to achieve high opacity and homogeneous ink application with UV flexographic opaque white

For high coverage and homogeneous white areas without pinholes or an orange-peel effect, the ink and its pigmentation are not the only key variables. The choice of anilox roller and viscosity are also important.

Choice of anilox roller and layer thickness

To achieve optimal opaque white surfaces, the anilox roller should take up a volume no higher than approx. 22 cm³/m², engraved with 120–140 l/cm. Higher volumes require a lower screening, which produces an orange-peel effect. This texture will also appear in the overprinted layers, which is normally undesirable.

If higher volumes are required, of course they can be used. The highest volume tested so far was 36 cm³/m² with 60 l/cm. Layers with such high thicknesses are recommended for application in which the screen print is consciously being imitated and a texture, relief or textural effect is required.

Choice of anilox roller and opacity, pinholes

Due to its engraving, the anilox roller has an effect on the ink quantity transferred and the frequency of pinholes. In turn, the ink quantity has an effect on the opacity, and if the opacity is too low, the printing material may be visible.

Influence of pigmentation and viscosity

Adding as much pigmentation to the white will not necessarily make it more opaque. On the other hand, if the viscosity is too high, the ink will not flow smoothly, resulting in a sub-optimal coating and pinholes.

A **proper combination of pigmentation and viscosity** is the key factor. The best opacity is achieved with medium to high pigmentation and the lowest possible viscosity. A white made like this exhibits optimal flow and high coverage, and tends not to form pinholes.

The table below compares three UV flexographic opaque white inks with different levels of pigmentation and viscosity. To assess the opacity, the density of a black area beneath the respective white was measured. The white in the middle column has very high pigmentation and high viscosity. It covers very well (measured black density only 0.16), but produces pinholes. The white in the right column with medium pigmentation was printed at a low viscosity. It delivers similarly high coverage (0.16) but does not produce pinholes.

	81-010328-1 White F RAD 0008	**81-000173-5 White F Rad 0003**	**81-010168-3 White F Rad 0001**
Pigmentation Viscosity Anilox: HIT 22 cm³ 120 l **Pinholes** Anilox: 22 cm³ 140 l 45° ART **Pinholes**	**High** **0.5 Pa·s** **D = 0.17** **Very low number** **D = 0.18** **Low number**	**Very high** **0.9 Pa·s** **D = 0.16** **Low number** **D = 0.19** **High number**	**Medium** **0.35 Pa·s** **D = 0.16** **None** **D = 0.17** **None**

Density measurement of black beneath printed white area (the lower the D value, the higher the white opacity)

What you should know about UV ink decomposition products

Decomposition products are substances that are not contained in liquid UV inks. Instead, they are typically created when photoinitiators are exposed to UV rays. Some part of these decomposition products may migrate. Even if the decomposition products are not contained in the liquid UV ink, it is important for the printing ink supplier to declare them. For the analysis of printed packaging, the analysing institute must be told which potentially migrating decomposition products may be created. If the analysing institute is unaware of them, it may not be able to determine the migration value of these substances – users will be left with a false sense of security.

The inconvenience that may result from migration limit values being exceeded is sufficiently well known. If inadmissible concentrations of migrating substances are found in the product content (food), printing houses risk recalls and damage to their reputation.

The photoinitiators used in UV inks can be divided into two classes, depending on their reaction. When exposed to UV light, one class shows the Norrish Type I reaction in forming decomposition products, whilst the other shows the Norrish Type II reaction and does not generate any decomposition products.

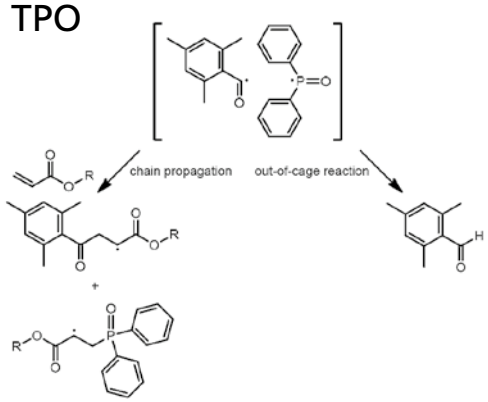
Type I: When these photoinitiators absorb UV light, they break apart into two radicals that polymerise (= link) the binding agent. Because radicals have very brief lives, some may decompose because they were not linked. The new chemical substances that result are called **decomposition products.** Because Type I initiators are split at a defined part of the molecule, the same substances typical of the relevant photoinitiator are always the result.

Type II: Although photoinitiators of this type do not generate decomposition products, we will explain this to you. They also absorb UV light, which puts them into an energetically higher state. This light absorption creates the radical from the initiator molecule that triggers polymerisation. The molecule becomes part of the ink coating.

For both Type I and Type II photoinitiators, it sometimes happens that not all of the initiator molecules available are stimulated enough to form a radical. They are not bound into the ink coating. The initiator molecules that do not react are not bound to the ink layer – so they may migrate.

Contact your Siegwerk application technician if you have more questions about migration and decomposition products. He will be pleased to provide more information.

TPO



Stabilisers can also migrate

All radically curing UV inks contain photoinitiators in order to trigger the polymerisation process under UV light. However, almost all UV inks show a tendency to premature photoinitiator activation as a result of daylight shining into the ink tray or even during transport and storage, completely without exposure to light. In the extreme case, polymerisation may occur too early or the ink›s viscosity may increase to an unacceptable level. Binding agents are also subject to polymerisation in recently delivered containers or before being processed into UV inks – without exposure to either light or photoinitiators. To prevent this from occurring, stabilisers are added to the binding agents. **Their function** is to capture undesirable radicals and, in the process, **protect the binding agent or the ink from premature polymerisation.**

The stabilisers in UV inks are usually chemically simple molecules with a rather high migration potential. If a low migration UV ink contains too much stabiliser or a stabiliser with a low migration limit value, the migration limit value of the printed packaging may be exceeded and a stabiliser proportion that is too high may be identified during analysis.