



New organisation for the business units Narrow Web and Sheetfed

Siegwerk is organised along the lines of six different business units. In order to maximize synergies, the business units Narrow Web and Sheetfed have been working closely together for a number of years. However, to operate even more efficiently in their markets, the business units were restructured on 1st January 2014:

- **Stefan Rosenberg** has assumed responsibility as Head of Sales EMEA for the sale of inks for Narrow Web in Europe/Middle East/Africa. He has also taken on the role of managing the Backnang branch. Here he is the successor to



Stefan Rosenberg

Knut Detlefsen, who is retiring after 24 years of successful contribution to Siegwerk.

- **Rolf Montag** now reports as Product Manager Narrow Web to Michael Müller-Samson.

With the new organisation, Siegwerk aims to boost further the presence and efficiency in the markets while

offering customers uniform quality of products and services, no matter where they are located.

New UV waterless offset machine «Codimag VIVA 340 Aniflo» at Siegwerk Switzerland

Siegwerk regards itself as a pioneer in low migration UV inks for waterless UV offset printing. It was therefore apparent that Siegwerk Switzerland should obtain a test machine for this process.



The team in Aarberg is delighted by the new system, with four-cylinder geometry and automatic temperature control, corresponding to the state of the art in waterless offset technology. The anilox roller transfers a constant ink film onto a rubber roller, this in turn colouring the printing plate. From the printing plate, the ink is transferred onto the rubber blanket. The new test machine allows Siegwerk to specifically analyse the performance of UV inks in the waterless UV offset method for very definite applications.

Gold bronze reclassified as hazardous

As part of the REACH registration, toxicity and ecotoxicity tests were conducted on powdered copper, these resulting in a reclassification as hazardous to the environment and harmful to health if swallowed. This has led to changes regarding the classification of Siegwerk products containing gold bronze.



Alloys such as gold bronze pigments derived from copper and zinc are treated in the CLP Ordinance (Classification/Labeling/Packaging) as a «mixture» of individual substances. Mixtures containing copper, e.g. gold bronzes, are **now regarded as harmful if swallowed and hazardous to the environment**. The danger to the environment therefore applies to practically all metallic inks based on raw materials containing copper or zinc; these must be reclassified as hazardous goods of Class 9 in accordance with transport legislation.

An information leaflet is currently being prepared by the European Printing Ink Association EuPIA. Please consult your Siegwerk application technician if you require additional information.

Common UV flexoprint varnishes

The following overview shows the most commonly requested standard UV varnishes for flexographic printing. (The low migration varnishes will be listed in the next edition of Narrow Web.)

SAP code	New designation	Comments
High-gloss varnishes		
85-600297-7	39-8 Varnish 1004 TT 0001	Suitable for thermo-transfer printing; overprintable; suitable for hot foil stamping (silicone free)
85-600533-5	OPV FL Overprinting varnish	Overprinting varnish resistant to chemicals
85-601805-6	39-0 Varnish 0189	High-gloss overprinting varnish
85-600441-1	38-0 Varnish 0099-1	Overprinting varnish for selected ECO, Semi and Topcoat thermal papers
Release varnishes		
85-601815-5	39-0 Release lacquer 0242	Release varnish for multilayer labels
85-600335-3	39-8 Release lacquer	Overprinting varnish for multilayer labels; very long storage time possible
Matt varnishes		
85-600347-0	39-0 Matt varnish 0001	Matt varnish standard (silicone-free)
85-600361-1	39-3 Matt varnish 0001	Matt varnish for exterior of sleeves (silicone free)
Primers		
85-601796-7	39-8 Primer varnish 0033	Hybrid primer with cat. components; optimised adhesion (silicone free)
85-601778-5	OPV FL Primer varnish	Primer for commercial plastic materials (silicone free)

Siegwerk in Spain receives best supplier award



From left: G. Pérez (Siegwerk), R. Valls (Siegwerk), Alejandro García (ASPACK)



ASPACK is an independent association of packaging manufacturers in Spain. A few years ago, the members of this organization created an award for «best supplier» in order to improve cooperation with suppliers with the ultimate goal of achieving a better quality that benefits all parties and results in greater efficiency for the customer. After an objective analysis of the monitoring done among the ASPACK companies, **last year's award has been granted to the Siegwert Spain**. The award ceremony was held on 12th February 2014 in Barcelona. Ms Denise Lejeune, Senior Manager Global HSE + Sustainability at Siegwert, used the occasion to give an interesting presentation on new regulations for safety of printing inks (food packaging, toys, BPA).

Overprinting varnishes for HP indigo prints

85-601854-4 LAB FL LM VARNISH 0178 SF
 85-600297-7 39-8 Varnish 1004 TT 0001
 85-600533-5 OPV FL Overprinting varnish

The first two varnishes can be overprinted with thermo-transfer. The third is a multi-functional overprinting varnish, but does not permit TT printing.

Important for overprinting: As HP indigo prints exhibit a low surface tension of only about 34 dyn/cm, corona pretreatment is necessary.

The adhesion of the varnish does normally not pose any problem.

New low migration UV screen printing white

Process: UV screen printing
Application: Labels for food packaging
Series: SICURA SCREEN 78-6
Product number: 81-010283-0
78-6 Opaque white LM 0001

This silicone-free LM opaque white has been developed specially for food packaging labels.

With regard to viscosity, it has been formulated for rotary screen printing and is distinguished by good adhesion on various plastics. It is highly opaque, scratch-proof, solvent resistant and is easy to use – ideal for no-label look applications. Thanks to its high surface tension, this opaque white can optimally be **overprinted in combination** with LM offset and LM flexo inks.

Excellent results from our Customer Survey 2013

Many thanks to all our customers who participated in last year's business unit survey. The most positive points which the survey indicated are the following:

- **About 95% of the respondents rate Siegwerk positively and are satisfied with its inks and services.**
- The consistency of product quality and the supply chain performance are

highly valued, likewise the technical guidance and the support.

- 93% of the respondents are willing to recommend Siegwerk to others.

Thanks to the feedback, we also have identified opportunities to satisfy the customers even better and we are aware of some particular points requiring individual follow-ups.

Printers' Corner

We were asked whether Siegwerk can also supply low migration LED inks.

Bernd Miller, Head of Technology BU SF&UV, gave the following answer:

«Normal LED inks are developed, tested and proven in practical application. Fortunately, they are becoming increasingly more in demand. However, the inks of the present LED series SICURA LEDTec can migrate and therefore are not suitable for use in the food sector.

We are working intensively on the development of migration-optimised LED ink series.

Because Siegwerk is not prepared to make any compromise when it comes to migration-optimised applications, the development is taking a little longer. However, we hope that we can release the low migration LED series for sale during the course of this year.»

Overall customer satisfaction rated from 1 (=low) to 10 (=high), Percent



Customers willing to recommend Siegwerk to others, Percent



Health Safety Environment

Waiting for a regulation

The new Printing Ink Regulation in the **German Consumer Goods Ordinance** announced for 2013 has still not been published. The reason for the delay lies in different opinions of the Consumer Protection Ministry and the sector organisations. These advocate regulations that can actually be implemented, similar to the Swiss Consumer Goods Ordinance of 2010, which is stipulated as an order basis by prominent food producers. The sector organisations also support uniform regulations for the entire EU. As a result, a new regulation is not expected to come into effect before the middle of 2015.

Even without this ordinance, Siegwerk will continue to offer high-quality low migration inks, which can be used to safely print food packaging so as not to put consumers at risk. As a rule, **UV printers should always use low migration inks and varnishes for food packaging**, where the currently applicable migration limit values can be complied with, and they should have their curing process validated by means of migration tests.

Well Worth Knowing

Transparent and brightened inks exhibit reduced light-fastness

Printers are often not aware that the light-fastness of brightened or transparent inks is significantly below the normal light-fastness of the relevant ink. The admixture of white or brightening reduces considerably the component of colour pigments, this leading to a visual appearance where the fading of the pigments by the effect of light becomes much more visible. Red, orange and yellow hues are especially affected by decreasing light-fastness (and usually also by declining resistances, such as resistance to acid). In

contrast, black, cyan and green do not normally pose any problems as light-fastness decreases. Incidentally, the light-fastness is indicated on the ink containers. To counteract the effect of decreasing light-fastness, we recommend the use of **special inks with more effective light-fast pigments**. Talk to your Siegwerk application technician if you are worried about problems with light-fastness in transparent or brightened inks.

Well Worth Knowing

Ask your Siegwerk application technician for detailed information on this subject.

Adhesion of ink on plastic and paper

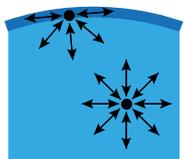
The adhesion of inks and varnishes depends – irrespective of the printing method – on the following four factors:

- Surface tension of the substrate and the wet ink
- Swelling capacity of the substrate surface
- Drying method of the ink (shrinkage)
- Roughness of the surface

Depending on each case, these factors can have varying degrees of effect.

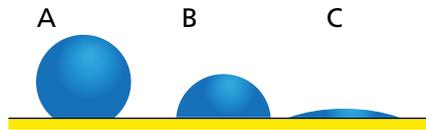
Surface tension of the substrate and wet ink

Two intermolecular forces of attraction are distinguished: The force of attraction between two different substances (e.g. between liquid printing inks and substrate) is referred to as **adhesion**. The forces of attraction within a substance (e.g. in the ink droplet) are called **cohesion**. The cohesion forces on the surface of a liquid are referred to as surface tension.



Cohesion forces

If the surface tension, i.e. the force by which the molecules mutually attract one another on the surface, is greater than the adhesion force between the droplet and substrate, the liquid will contract. It tends to assume a spherical shape, this is typically revealed by water forming beads that drip off a waxed surface. If the surface tension of a liquid is lower than the surface tension of the substrate or the previously printed ink film, this liquid – e.g. the freshly applied ink – will tend to spread. It stands to reason that a printing ink that spreads over the substrate surface, i.e. wets this well, will adhere better than if it forms beads that drip off.



Wetting behaviour of a droplet on a solid surface.

According to wetting theory, few or no adhesion forces act on the boundary surface in case A, while very high adhesion forces act in case C.

The surface tension is indicated in dyn/cm (= 1 mN/m). With solids this force is referred to as surface energy. The surface energy or surface tension of some frequently used plastics and UV inks are listed here as examples:

Polyethylene LD (low density)	PE-LD	31
Polypropylene	PP	32
Polyethylene terephthalate	PET	43
UV SCREEN WHITE (contains silicone)		24
UV SCREEN WHITE SF (silicone-free)		40
SICURA FLEX 39-8		38
SICURA FLEX 39-10 LM		39

For a good wetting behaviour of the ink on a substrate, **the surface energy of the substrate must be higher than the surface tension of the ink**. If this is not the case, the substrate will repel the ink. The following two options are always available to improve the wetting behaviour of an ink:

- Increasing the surface energy of the substrate (e.g. via corona pre-treatment or primer)
- Reducing the surface tension of the ink (using silicone or other additives)

Swelling capacity of the substrate surface

The swelling capacity or also partial solubility of substrate surfaces plays an important role in anchoring the ink when printing on plastic films. Although the substrate appears to have a smooth surface, the smallest molecules from the ink, such as solvents or UV monomers, can penetrate into the uppermost layer.

As a rule of thumb: the smaller the molecules in the ink, the more «aggressive» they are. PE and PVC exhibit good swelling properties.

Ink drying method

In the case of physically drying inks, a solvent (e.g. water, alcohol) evaporates, while chemically drying inks involve a chemical reaction, as occurs with UV and EB inks. In both cases, the process is associated with a certain shrinkage of the ink film. With the physically drying inks, the solvent leaves the ink film in a vertical direction; the dry ink film is thinner than the applied ink layer, but adheres well.

A three-dimensional crosslinking occurs during chemical drying. Depending on the UV system, a shrinkage of 5 to 15% results, this not only having an effect on the thickness of the ink layer but also in the horizontal direction. This explains the effect of curling during UV printing on thin plastic substrates. The tension built up in the ink/film area leads to a reduction in the adhesion properties.

Surface roughness

In contrast to the plastic films, the surface roughness plays an important role with paper and cardboard. If the ink is able to penetrate into cracks and pores on the surface of the paper, an improved anchoring will logically result. Inks therefore adhere to paper practically without any problem.

Nevertheless, when it comes to UV inks on paper we are confronted with the problem of «diving» (immersion, sinking); this has nothing to do with adhesion failure. The liquid components (binding agents) of the UV ink are absorbed by the paper and cannot cure under the UV lamp, which means the inks do not adhere. In this case, a primer must be pre-printed (= fills the pores).