



### 1. Description / Application

**Universal screen printing inks**, curing by **radical mechanism** with UV-light, for a multitude of synthetic substrates - inline Corona treated polypropylene included - and for paper, with high gloss and good fastness properties.

With the 78-3 series, Siegwerk has developed an ink type that meets, due to its versatility, the high performance required by the producers of **self-adhesive labels** which print by rotary screen systems a broad spectrum of substrates. Inks of the Sicura Screen 78-3 series are also suitable for fast printing flatbed machines.

### 2. Product Safety

Intended Use

Food Packaging: **no**

Compliance Management

Only intended for food packaging if the processing conditions rule out the possibility of set-off in the reel or stack and the design of the final printed article ensures reliable functional barrier properties to migration.

The "Customer Guidance: Printing Inks for Food Packaging" has to be observed.

Please refer to this document which can be easily downloaded from our web site:

<http://www.siegwerk.com/en/customer-segments/customer-service/food-packaging-safety.html>

### 3. Properties / Substrates

- Optimized overprintability with UV-Flexo, UV-Letterpress and UV-Offset inks
- Improved curing speed
- Good intercoat adhesion and good leveling when overprinted with UV-Flexo inks of the series 39-8, UV-Letterpress ink series 41-2 and suitable UV-Offset inks
- Glossy, brilliant shades
- Standard applications for normal requirements on in-line Corona treated polypropylenes need no addition of hardener
- With Hardener 71-470074-7.1180 (411-90): suitable for die-cutting resistance, water resistance and other enhanced requirements, in particular if critical substrates are to be used.

Adhesion, resistance to scratching and scuffing, water resistance (wet scratch and wet scuff resistance) and far-reaching resistance to cosmetics, lotions, shampoos, alcohol, cleaning agents and solvents are obtained on the following substrates:

- In-line Corona treated polyethylene, with surface tension level of at least 40-45 mN/m
- In-line Corona treated polypropylene, with surface tension level of at least 42-45 mN/m
- Lacquered/primed polyethylene
- Lacquered/primed polypropylene
- Selected lacquered/primed aluminum (e.g. PVC-lacquered aluminum)
- Selected lacquered/primed aluminum-metallized substrates
- Selected lacquered/primed polyester
- Coated paper and cardboard
- In-line Corona treated high-gloss paper
- Uncoated paper and cardboard with low porosity
- Polyethylene "papers" (e.g. Tyvek, Syntepape)

Other substrates after technical evaluation.



Special applications:

#### Thermal papers:

- The inks of this series are **not** suitable for **economic thermal papers** due to the darkening of the thermo-sensitive layer. Their suitability on **Top-Coat thermal papers** is **limited** mainly due to the comparably thick ink coat which may affect the thermal response.
- Please consult the Technical Information "Printing on thermal papers: Recommendation of suitable ink/material combinations". This information will help you to select specific substrates and ink types in order to achieve optimal heat smear resistance and water resistance.

#### Thermal transfer/Suitability for hot stamping:

- The imprintability of the inks of this series by thermal transfer resp. hot stamping is only limited.
- The good acceptance of the print image depends largely on the surface smoothness of the substrate, the quality of the ribbon and the type of the printer.
- The good acceptance of the hot stamp image is normally limited to good when hot stamping **in-line**. However, when hot stamping out of line, as well as in thermal transfer **after aging of the printed inks**, the imprintability is limited to poor.

Contact our technical department for more information.

#### To observe:

- *Before the print job is started, **new materials**, in particular plastic substrates, must be checked for compatibility with the inks of this series or with the planned ink/overprinting varnish combination, even if their suitability on a comparable type substrate is proved.*
- *The test prints are to be examined after die-cutting (in particular at the edges) for adhesion, resistance to scratching and water (resistance to wet scratching and scuffing), resistance of the printed ink to the packaging contents and other application-specific requirements. In particular, please check whether you must use the Hardener 71-470074-7.1180 (411-90) (see page 7).*
- *Due to the after-curing process, these properties may change in during the first 24 hours after printing. Please do therefore an after-check.*
- *Before starting a new print job on a known material, but with new shades and/or new ink resp. ink/varnish combinations, please verify whether the **resistances** and, if applicable, other properties fulfill the **application-specific requirements**.*
- *PVC and unprimed polyethylene and polypropylene substrates sometimes contain lubricants, which migrate to the surface e.g. during storage. Such substances may be present even if the measured surface tension is higher than 42 mN/m; they can negatively influence the adhesion, the scratch and water resistance of the printed inks.*

In case of doubt, please contact in time our technical department.

## 4. Printing and processing instructions

### Basic shades

A range of basic shades with which most of the desired shades can be self-mixed, is available (see below list of basic shades). The basic inks correspond in shade largely to those of the PANTONE mixing system.



Working with basic inks offers you the following **advantages**:

- The ink is available immediately.
- You are able to prepare the correct amount of required ink: you will neither have too much nor too little ink.
- The minimized quantity of leftover ink can be reused when mixed with the pure basic inks into new shades.
- You can order basic inks in larger quantities and in larger containers, thus having less empty containers to dispose of.

To observe:

*As the choice of pigments for UV inks is limited and due to the migration resistance on PVC and to the fastness required for plastic labels, the inks in the range of the so-called "fanal" shades (Reflex Blue, Blue 072, Violet, Purple and Rhodamine Red) are slightly less brilliant than the correspondent PANTONE basic shades. Furthermore, differences in shade have to be expected when working with PANTONE mixing formulas.*

### Overprint varnish

SICURA SCREEN UV-Overprint varnish 85-601643-1.2730 (78-3-001):

If higher gloss, better mechanical resistance and/or improved fastness to packaging contents or wetness are required, overprint varnishing with the mentioned or another suitable varnish is necessary.

UV-Tronic HM Luminescent Paste 71-470092-9.1180 (806 205):

When added at 1 - 3 % to one of the above-mentioned or another UV varnish, this paste, which is nearly colorless at visible light, imparts a blue luminescence at UV-A illumination.

### Lamination

**SICURA-FLEX Laminating adhesive 85-601592-0.2360** (39-0-0167):

Universal adhesive, particularly for laminates polyethylene/polypropylene, polypropylene primered/polypropylene and polypropylene in-line Corona/polypropylene

Optimum gloss and protection can be obtained by **in-line** lamination of the prints in the flexo varnishing unit with this or an other selected adhesive, cured thereafter across the transparent laminating film by UV radiation.

To observe:

- *The suitability for in-line lamination of the printed inks of this series is limited to good. In contrast, due to the changed surface, an out of line lamination after aging of the prints is normally not possible.*
- *Please observe in any case the Technical Information of the UV laminating adhesive.*

### Curing

Suitable for curing the inks of this series are medium pressure mercury vapor UV emitters with a power of at least 120-200 W/linear cm. Optimum results can be achieved using high performance quartz coated aluminum reflectors, which reflect almost the total UV radiation across the whole spectrum, but eliminating the infrared portion (e.g. by the aid of the "cold mirror" technology). Such reflectors yield maximum radiation density at minimum web heat load.

For more power two or more units can be connected in series.

The printing speed depends not only on the curing unit but also on the shade, color strength and opacity. Generally, black, white and bronze inks will dry slower than yellow, red or varnishes.

Under normal conditions it is possible to print at a speed of 40 - 60 m/min.



## Printing

### To observe:

*Stir up well each ink or varnish before use. Mainly Whites, colors containing White, varnishes, lacquers, mat varnishes as well as gold and silver inks show sedimentation of essential components. Before processing such products, please make sure that all components are well dispersed again.*

## Screens

Any rotary screen printing form developed by the foto-polymerization process resp. any polyester flat-bed screen with a solvent resistant emulsion may be used.

Rotary screen form recommendations:

	Rotamesh, Stork		Screeny, Gallus
	Mesh	Open area (%)	Type
Line images and/or texts:	305	13	KS or KM
Intensive solids:	305	13	HV or KS
Fine lines:	305	13	KM or KF
Gold/silver:	305	13	KS
Overprinting varnishes:	305	13	KM
Relief:	75	40	BZ

### **SICURA SCREEN UV-Extender varnish 85-601628-2.2730 (78-3-23):**

This extender serves to **reduce the color strength** of the inks without altering their viscosity.

### To observe:

#### Special provisions before printing pastel shades

- *Due to the high requirements on the reactivity, the colored inks of this series and this extender varnish contain a special combination of photoinitiators. Depending on the dose of the UV irradiation and the degree of color reduction, this may lead to a yellow discoloration of pastel shades and clear varnish. This color shift may at least partially disappear after a certain time.*
- *This extender is not suitable as overprinting varnish.*
- *Do not use this extender for extended brightening, but White 81-011485-0.1710 (78-3-01 or Overprinting/Extender varnish 85-601643-1.2730 (78-3-001).*
- *Please verify in any case after about 30 minutes, whether the shade has changed compared to the fresh print.*



## UV-Hardener 71-470074-7.1180 (411-90):

Die-cutting resistance, cold and hot water resistance/sterilization resistance and other enhanced requirements can be achieved - in particular on in-line Corona treated polypropylenes and other critical substrates - only by addition of hardener.

### To observe:

- *Just before printing, you must add - under intensive stirring - to every ink or varnish of this series to be printed fully or partially on in-line Corona-treated polypropylene, 1-2 % **Hardener 71-470074-7.1180 (411-90)** (isocyanate hardener).*
- *The chemical crosslinking process and therefore the development of the required resistances needs **about 24 hours** at room temperature.*
- *Pot life: the mixture has to be processed **within 12 hours** after the hardener addition. This time elapsed, the mixture must be discharged owing to viscosity increase and reduced quality of the chemical crosslinking.*
- *Therefore: please estimate the amount of the mixture needed for the job resp. for max. 12 hours rather on the low side. If you observe towards the end of this period that it will not be sufficient, you can prepare a fresh ink/hardener mixture - now precisely calculated - and add it to the remaining mixture in the fountain. By doing so, you have only an irrelevant amount of it to eliminate at the end of the job.*
- *At machine stops for longer breaks and at the end of the shift, screens and soiled parts on the machine have to be cleaned immediately, before the ink has reacted!*

## UV-Thinner 71-470162-0.2730 (411-24):

This reactive thinner serves exclusively to reduce the **ink viscosity**.

### To observe:

*The curing will only insignificantly be affected, if the addition of this UV thinner is **limited to max. 10 %**. Higher additions may deteriorate the dot respectively print sharpness and reduce the curing speed (e.g. causing a fall in adhesion and resistance to scratching and scuffing).*

## UV-Flow promotion agent 71-470165-3. 2730(411-50):

If disturbances of leveling/flow appear at high printing speed and this **cannot be removed with the thinner 71-470162-0.2730 (411-24)**, the UV-Flow promotion agent **71-470165-3. (411-50)** can be added to the inks. The addition is **1 - 3 %** based on total ink quantity (including thinner and varnish).

## UV-Thixotropy paste 71-470112-5.2730 (411-31)

This paste can be added to the ink for improving the sharpness when printing fine lines of halftones. It causes a thickening of the inks (thixotropy) without increasing tackiness and improves the drying. The addition is **10-30 %** relative to the total ink quantity (including thinner and blending varnish).

## Cleaning

The inks can be removed from screens and tools by **Cleaner 10-650038-2.** (V 316) or methoxypropanol.

### To observe:

*Reactive UV thinners are not suitable for cleaning.*



## 5. Shelf life

The inks and varnishes of this series have under normal conditions a shelf life of **at least 9 month**. Within this period the products are usable in conformity with the indications of this data sheet.

Normal conditions mean:

- storage in firmly closed, not yet tapped containers;
- temperatures not exceeding 20°C for weeks or 25°C for days.

The shelf life can be extended by cool storage below 15°C.

To observe:

*Do not expose open containers to direct sunlight or strong light sources.*



### 6. Product List

#### Basic shades

Product name	Pantone	Product code	Light Resistance according to wool scale (DIN ISO 12040)	Alkali Resistance (DIN ISO 2836)	Ethanol Resistance (DIN ISO 2836)	Solvent Resistance (DIN ISO 2836)
78-3 White 01		81-011485-0.2730	8	Yes	Yes	Yes
78-3 Opaque White 101		81-011515-4.2730	8	Yes	Yes	Yes
78-3 Greenish Yellow 03		81-321639-7.2730	5-6	Yes	Yes	Yes
78-3 Euro Yellow PMS 012 C	Yellow C; similar 012 C (lightened: Proc. Yellow C)	80-321618-3.2730	4	Yes	Yes	Yes
78-3 Orange PMS 021 C	Orange 021 C	81-706081-7.2730	4	Yes	Yes	Yes
78-3 Warm Red C 17	Warm Red C	81-844084-4.2730	4	Yes	Yes	Yes
78-3 Red PMS 032 C 18	Red 032 C	81-844087-7.2730	6-7	Yes	Yes	Yes
78-3 Euro Red Rubine Red C 09	Rubine Red C, Process Magenta C	80-844042-4.2730	5-6	Yes	Yes	Yes
78-3 Rhodamine Red C 10 (**)	similar Rhodamine Red C	81-844060-4.2730	6-7	Yes	Yes	Yes
78-3 Purple C 13 (**)	similar Purple C	81-106596-0.2730	6-7	Yes	Yes	Yes
78-3 Violet 14 (**)	similar Violet C	81-106593-7.2730	6-7	Yes	Yes	Yes
78-3 Reflex Blue C 12 (**)	similar Reflex Blue C	81-113277-8.2730	6-7	Yes	Yes	Yes
78-3 Process Blue C 11	Process Blue C (Cyan)	80-113231-7.2730	7-8	Yes	Yes	Yes
78-3 Green PMS C 15	Green C	81-514488-6.2730	8	Yes	Yes	Yes
78-3 Process Black C 02	Process Black C	80-909689-4.2730	7-8	Yes	No	Yes
78-3 Black faster drying 951		80-909713-2.2730	4	Yes	Yes	Yes
78-3 Varnish 23		85-601628-2.2730		Yes	Yes	Yes
78-3 Overprint varnish 001		85-601643-1.2730		Yes	Yes	Yes

(\*) Special basis inks for special shades

(\*\*) These shades are in series 78-3 less pure due to the avoidance of the poorly resistant "fanal" pigments.

Reactive thinner

**71-470162-0.2730** (411-24)

Flow agent

**71-470165-3.1020** (411-50)

Thixotropy paste

**71-470112-5.2730** (411-31)

Hardener (Isocyanate)

**71-470074-7.1180** (411-90)

Photoinitiator Standard

**81-470275-9.1020**

Photoinitiator for White

**81-470167-8.1020**

Luminescent paste (for Overprint varnish)

**71-470092-9.1180** (806 205)



## 7. Security Labelling

### Classification:

EU: Irritant (Xi). Irritating to eyes and skin (R36/38). May cause sensitization by skin contact (R43). Contains acrylates, trimethylolpropanetriacrylate and hexanedioldiacrylate.

Because of the differences in materials for printing, processing conditions and test criteria **this Technical Data Sheet can only be of an advisory nature.**

Our data reflect the latest state of our knowledge and are based on the characteristics established in the laboratory and on practical experience. **Your own tests with the original materials under the respective conditions are indispensable.**

We disclaim any liability for applications for which this ink series is not foreseen.