1. SHORT DESCRIPTION / APPLICATION

**Daylight fluorescent** flexo printing inks, curing by radical mechanism with UV-light, for paper, inline Corona treated polyethylene, lacquered/primered polyethylenes and lacquered/primered polypropylenes and other substrates, particularly suitable for processing with all flexo label printing machines equipped with an UV-curing system.

Based on the proven UV-flexo series 39-2, Siegwerk offers to the printer with the new UV-fluo series 39-4 equally performing, highly brilliant daylight fluorescent inks, which - based on its flow properties fit for flexo printing - can be processed, normally straight out of the container, on conventional flexo printing units.

2. PROPERTIES / SUBSTRATES

- High fluorescent intensity
- Excellent printability
- Fast curing
- Low viscosity, flow properties fit for flexo printing
- Free of chlorinated binder resins and additives

Adhesion, resistance to scratching and scuffing as well as frequently sufficient water resistance (wet scratch and wet scuff resistance) are normally obtained on the following substrates:

- **Inline Corona treated polyethylenes**, with surface tension level of at least 40 - 45 mN/m
- **Lacquered/primered polyethylenes**
- **Lacquered/primered polypropylenes**
- **Uncoated papers and cardboards with low porosity**
- **Coated papers and cardboards**
- **Polyethylene "papers"** (e.g. Tyvek, Synteape)

Other substrates after technical evaluation

*To observe:*

The inks of this series are normally not suitable for:

- Not inline Corona treated polyethylenes
- Not inline Corona treated polypropylenes as well as inline Corona treated polypropylenes
- Polystyrenes
Special applications:

- **Thermal papers:**
  - Except for special new paper qualities, inks of this series are not suitable for economic thermal papers due to the darkening of the thermo-sensitive layer.
  - Due to the poor heat-smear resistance, the prints with inks of this series are not imprintable by thermo-printing. They are therefore only suitable for top-coat thermal papers, if the fluorescent prints do not come into contact with the hot printing thermoelements.

- **Thermal transfer/Suitability for hot stamping:** The imprintability of the inks of this series by thermal transfer resp. hot stamping is limited to good. 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. Contact our technical department for more information.

Contact our technical department for more information

_To observe:_

- Before the print job is started, new materials, in particular special 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 of the same substrate group is proved.

  The test prints are to be examined, in case of self-adhesive labels 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.

- 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.

- If you intend to produce for packagings which are subsequently to be filled with odor-sensitive contents, please make sure that the typical odor of the prints will not affect them.

  If you want to print on materials which will later be used as an immediate food wrapper or which will be placed close to food, please contact Siegwerk. Read our Technical Information “UV- and electron-beam curing printing inks and varnishes: Physiological harmlessness and suitability for food packagings” (available on request).

- Unprimered polyethylene 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.

**Fastnesses**

The particular fluorescent intensity of the products of this series is based on soluble fluorescent dyes, which perform considerably lower light and product fastnesses compared to the usual insoluble color pigments. Consequently, water resistance (wet scratch and wet scuff resistance) and resistances to the packaging contents (scratch and scuff resistance after contact with the product) are limited. The following restrictions of use have therefore to be respected.
To observe:

- The light fastness of usual prints, applied in one printing unit, is normally around WS 1. As a rule, these daylight fluorescent inks are – even if overprint varnished - therefore not suitable for use in direct sunlight. Nevertheless, practice shows that their fluorescent intensity is preserved up to 6 month in artificial light.

  Remark: if you print the same fluorescent ink – applying two layers - in two printing units, you may nearly double the light fastness up to WS 2.

- Prints which are not overvarnished bleed-out and are poorly resistant to water, fat, foods, cosmetics, lotions, shampoo, alcohol, cleaning agents and solvents.

  Therefore, the inks are normally not suitable for direct printing on materials, which will later be used as an immediate food wrapper or which will be placed close to food.

- Due to their poor resistance to sweat and saliva, the products of this series are not suitable for toys.

3. INSTRUCTIONS FOR PRINTING AND PROCESSING

Overprint varnishing

If higher gloss, better mechanical resistance, improved fastness to packaging contents or moisture and/or other specific properties are required, overprint varnishing in a UV-flexo varnishing unit with one of the mentioned or another suitable UV-flexo varnish is necessary. Please consult the correspondent Technical information.

BARGOFLEX UV varnish 85-601805-6.2360 (39-0-0189): Universal high performance varnish for plastic substrates, high gloss, very high resistances

BARGOFLEX UV varnish 85-601583-9.1470 (39-0-0126-2): For plastic substrates, high gloss, high resistances

BARGOFLEX UV varnish 85-601797-5.1490 (39-6-1004): Based on UV flexo series 39-6 for plastic substrates, improves suitability for thermal transfer/hot stamping

To observe:

Each new substrate/ink/overprint varnish combination requires a test print and an evaluation, in case of label materials after die-cutting (in particular at the edges), for the required extent of mechanical resistances (e.g. scratch and rub resistance, adhesion), of resistances to the packaging contents and water (resistance to wet scratching and scuffing) and for other application-specific requirements.

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

Lamination

To observe:

Due to poor bond strength values, the fluorescent inks of this series are normally not suitable to be overlaminated.
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.

To observe:

*Strong UV radiation destroys the daylight fluorescent dyes* of these inks. Starting from a dose, which corresponds at medium printing speed (around 70 m/min) to two UV lamps of 100 W/linear cm each (equal to 200 W/linear cm), weakening of the fluorescent intensity has to be expected. As a matter of fact, the tolerance between optimum curing and preserving the fluorescent intensity is relatively narrow.

Therefore you must observe the following:

- Limit the UV radiation dose, to which each fluorescent print is exposed on the printing machine in total, to the lowest possible value necessary for the required degree of curing.

- Print these fluorescent inks always in the last possible printing unit.

Printing

Printing in two printing units:

Normally you may improve the resulting fluorescent intensity overproportionally if you print the same fluorescent ink in two layers – under the condition that the image to be printed allows this. Compared to the single layer print, you will obtain nearly a three-fold intensity. Due to the double surface concentration of the fluorescent dyes, you will in parallel normally double the light fastness of the print.

Anilox rollers:

Depending on printing image, substrate and choice of single or double layer printing, e.g. laser-engraved ceramic anilox rollers (with doctor blade) with a 120 screen/cm and F. 14 (*) or higher can be used.

(* F = theoretical ink transfer in g/m²)

To observe:

- If you intend to use anilox rollers with a diameter less than 60 mm, you should prefer a theoretical ink transfer about 25 % higher than the above values.

- Due to the solids content of these inks being 100 % and their consequently higher viscosity compared to solvent or water based inks, printing without doctor blade is not possible.

Printing plates:

In principle, photopolymer plates are suitable. However, the resistance to the products of this series has to be tested individually.
Ink preparation

To observe:

- **Stir up** well each ink before use. Before processing such products, please make sure that all components are well dispersed again.

- In principle, the inks of this series are miscible with the inks of BARGOFLEX UV-Series 39-2. **However**, even minimal admixtures of normal colored inks normally destroy the fluorescent power.

  Exception: by admixture of small amounts of Green (Pantone C) to Greenish Fluorescent Yellow you obtain Fluorescent Green shades.

Cleaning

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

To observe:

*Reactive UV thinners are not suitable for cleaning.*

4. SHELF LIFE

The inks of this series have under normal conditions a shelf life of **at least 6 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.*
### 5. BASIC SHADES / LIST OF PRODUCTS

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*Packing code: It concerns a standard cask. If you wish another packing size, we will be pleased to send you the appropriate packing code.*

(*) Special basic shades for special ink shades
WS = Wool scale acc. to ISO 2835/DIN 16525 (1 = poorest, 8 = highest light resistance)
6. SECURITY

Classification:

Switzerland: Toxicity class 4

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

To observe: Safety data/Information on composition

Do not handle products without having consulted the corresponding safety data sheets. We supply them together with the first shipment to your safety manager.

7. HSE

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”, in Appendix 2 “the Selection of the Ink Product” http://www.siegwerk.com/en/customer-segments/sheetfed-uv/service.html has to be observed.

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

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.

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