



## 1. Description / Application

Flexo printing inks, curing by **free radical mechanism** with UV-light, for a wide range of plastic materials and other substrates (lacquered aluminium), suitable for processing with all types of UV-Flexo **label or packaging** printing machines .

These products can be used straight out of the container - with conventional flexo printing units. The use of printing plates with a very fine half-tone screen is thereby possible, and uniform printing quality over the entire production time is guaranteed.

## 2. HSE

### Intended Use

Food packaging: YES

### Compliance Management

In the manufacture of food packaging, the printer and/or packer/filler have the responsibility to ensure that there is no migration of concern through the substrate and/or via set-off from the printed outer side to the food contact surface in the stack or the reel.

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>

SICURA Flex 39-20 LM inks for primary food packaging are formulated and produced according to our advanced corporate standards ("Good Manufacturing Practices") for minimum odour and off-flavour potential, and for lowest migration potential as set out in the Technical Information "Suitability of ... printing inks and varnishes for food and pharmaceutical packaging" (available on request).

In particular, SICURA Flex 39-20 LM products represent a new generation of inks exclusively formulated with selected components, so as to both minimise potential migration of concern through the substrate, and/ or the set-off from the printed outer side to the food contact surface in the stack or the reel.

SICURA Flex 39-20 LM formula comprises no one of the following:

- Basic dye complex ("fanal") pigments with high bleeding tendency
- Low molecular weight acrylates with potential to leave undesirable contents of free monomer in the cured printed layer, and with high potential to migrate into food at undesirable levels
- With this advanced design, a high degree of ink-side safety is provided, enabling the converter to produce packaging, which is minimized in sensory impact and migration of concern according to today's standards.

Note that set-off and migration are dependent on the processing conditions and sufficient barrier properties of the substrate. Particular consideration for these parameters, and for the selection of non-bleeding ink references with resistant pigment, is required in case of demanding areas such as packaging for

- organoleptically sensitive foodstuffs in general
- liquid or pasty, fatty and/or aqueous or acid food  
pasty or solid fatty food
- microwaveable and ovenable meals.

You will produce a safe packaging material if you observe good printing practices and restrictions as outlined in the Technical Information mentioned above. In particular, these inks are not approved for direct contact with food, separated from it or not by a varnish layer.

Please contact us if you plan to produce microwaveable and ovenable food packaging.



## Responsibility

The manufacturer of the finished printed article and the filler have the legal responsibility for compliance. The instruments for verification of compliance of the printed and dried layers are assessments done by the printer on the final packaging.

Material combinations are under your own control. You should conduct representative analytical investigations, such as organoleptic and migration testing, to cover each relevant application category. We will identify specific components whose migration should be monitored to assess compliance, and make available such information to those parties specifically involved in the compliance control.

We will inform you on bodies that provide the required capabilities and analytical sensitivities for the qualified verification of printed packaging.

## 3. Properties / Substrates

- Excellent printability
- Allows high printing speeds on in-line printing machines
- Good gloss, high color strength and dot sharpness
- Particularly low in odor and migration risk
- Excellent fastness properties
- Excellent heat seal resistance
- Suitability for lamination
- Pasteurization and sterilization ability with suitable substrates and 2-comp. primer

Adhesion, resistance to scratching and scuffing, water resistance (wet scratch and wet scuff resistance), heat-sealing resistance, far-reaching resistance against hydrogen peroxide aseptic treatment and excellent resistances to fats, acid or alkaline products, cosmetics, lotions, shampoos, alcohol, cleaning agents and solvents are normally obtained on the following substrates:

- Lacquered/primered polyethylene (self-adhesive label materials)
- Lacquered/primered polypropylene (self-adhesive label materials)
- Acrylic coated polypropylene (self-adhesive label materials)
- PVC coated polypropylene (self-adhesive label materials)
- Selected "treated"/primered polyesters
- Selected lacquered/primered aluminium foils and lid foils (e.g. with selected polyester, nitro- or PVC-primer)
- Uncoated papers and cardboards with low porosity
- Polyethylene "papers" (e.g. Tyvek, Synteaape)
- Top-coat thermal papers

Other substrates after technical evaluation

Packaging materials in reverse printing with pre-lacquering of 2-comp. primer lacquer **85-601856-9.2730** (39-9P-0201), Surface printing with pre-lacquering of 2-comp. primer **85-601856-9.2730** (39-9P-0201) or 2-comp. opaque White **81-011513-9.2730** White F Rad LM Label 0002 (39-9P1110) each one with addition of 4% hardener **71-470074-7.1180** 4% (411-LM hardener 90):

- In-line Corona treated polyethylene, with surface tension level of at least 40 mN/m
- In-line Corona treated, oriented polypropylene, with surface tension level of at least 40 mN/m
- In-line Corona treated, coextruded polypropylenes, with surface tension level of at least 40 mN/m
- In-line Corona-treated polyester films (e.g. Hostaphane RN, Mylar A)
- Selected in-line Corona treated polyamide
- Amorphous polyesters in-line Corona treated
- Polystyrene tapes in-line Corona treated
- Selected polypropylene tapes in-line Corona treated

Other substrates after technical evaluation



### Special application:

#### 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.

Please consult the Technical Information "Printing on thermal papers: Recommendation of suitable ink/material combinations". This information will help you to select specific substrates 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 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.

Contact our technical department for more information.

#### To observe:

*Before the print job is started, **new materials, in particular** special plastic substrates, **primed aluminium substrates** and coated papers or boards, 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 dry and **wet adhesion**, resistance to scratching and water (resistance to **wet scratching** and scuffing), adhesion and **scratch resistance after heat-sealing**, resistance of the printed ink to the packaging content, **preservation of the sealability and wet adhesion of the heat-seal coating** on the reverse side both after storage in the roll and after subsequent storage of the filled packaging, as well as for other application-specific requirements.*

*Due to the after-curing process, these properties may change 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**.*

*If you intend to produce for packaging which are subsequently to be filled with odour-sensitive contents, please make sure that **the hardly detectable typical odour** 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 Siegwirk. Read our Technical Information "UV- and electron-beam curing printing inks and varnishes: Physiological harmlessness and suitability for food packaging" (available on request).*

*Unprimed polyethylene and PVC 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.

#### Heat-seal resistance

The prints are heat seal resistant in the range between 160 to 250°C, depending on the substrate.

#### To observe:

*In case of very **extended lightening** of the colored inks to pastel shades or gold varnishes, in particular if pigments with different resistance to temperature are present in the mixture, irreversible color changes may happen due to heat-sealing or other thermal stress starting from 120 °C. Correspondent tests under original conditions are indispensable.*



*At heat-seal temperatures or other thermal stress over 200 °C - as well as following immersion in a hydrogen peroxide aseptic bath - certain combinations of light shades and/or of varnishes of this series with foreign primers, white inks and/or overprinting varnishes may cause irreversible **browning** due to interactions with foreign elements. Correspondent tests under original conditions are indispensable.*

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

#### 4. Printing and processing instructions

##### Basic shades

A range of basic shades of which most of the desired shades can be self-mixed, is available (see attached 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.
- You can optimally reuse the minimum quantity of leftover ink if you match it with the pure basic inks into new shades
- You are able to order basic inks in larger quantities and in larger containers, thus having less empty containers to dispose of.

Our technical department offers you assistance in your attempts for an optimized ink management.

##### Overprinting

SICURAFLEX UV varnish (39-9PSF 0178) **85-601854-4.2730** (high gloss, low in odor, high resistances)

If higher gloss, better mechanical resistance and/or improved fastness to packaging contents or moisture are required, over-printing with the UV-flexo varnishing unit of label printing machines or in a conventional flexo printing unit with one of the mentioned or another suitable UV-flexo varnish is necessary.

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

##### Lamination (Production of laminates for packaging)

On suitable substrates, the reverse printed products can be laminated with solvent containing and solvent free laminating adhesives.

##### Curing

Suitable for curing the inks of this series are medium pressure mercury vapor UV emitters with a power of at least 160 W/linear cm. Optimum results can be achieved using high performance quartz coated aluminium reflectors, which reflect almost the total UV radiation across the whole spectrum.

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

##### To observe:

*The printing speed and the quality of cross linking depend not only on the curing unit but also on the shade, color strength and opacity. Generally, **black, dark blue, white and bronze inks will dry slower than yellow, red or varnishes.***

*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.*

##### Printing plates



In principle, photopolymer plates are suitable. However, the suitability has to be examined individually.

## Anilox rollers

Depending on printing image and substrate e.g. the following or even finer laser-engraved anilox rollers (with doctor blade) can be used:

Application	[l / cm]	[cm <sup>3</sup> /m <sup>2</sup> ]
Four-color halftone prints:	250 - 360 screen/cm	3.5 - 4.5
Line images and/or texts:	180 - 195 screen/cm	6.0 - 7.0
Intensive solids:	160 - 180 screen/cm	7.5 - 8.5
Fine lines:	200 - 320 screen/cm	4.5 - 6.0
Gold/Silver:	100 - 120 screen/cm	10.0 - 12.0
Overprint varnishes:	120 - 165 screen/cm	8.5 - 10.0

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

***Stir up** well each ink or varnish before use. Mainly Whites, colours 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.*

*Primer **85-601855-1.2730** (39-9P-0200) + 4% hardener **71-470074-7.1180** (411-LM hardener 90), as well as 2-comp. White **81-011513-9.2730** White F RAD LM Label 0002 (39-9P-1110) + 4% hardener 411-LM hardener 90 have to be stirred well. Pot life is about 8 hours.*

## Cleaning

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

Primer + hardener/White + hardener: The rollers and tanks have to be cleaned immediately after the printing process.

### 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 months**. 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

Product Name	Product Code	Light Resistance according to wool scale WS (DIN ISO 12040)	Alkali Resistance (DIN ISO 2836)	Ethanol Resistance (DIN ISO 2836)	Solvent Resistance (DIN ISO 2836)
39-20 LM Transparent white 1000	81-000235-2.2730		Yes	Yes	Yes
39-20 LM Greenish Yellow 1270	81-300523-8.2730	6-7	Yes	Yes	No
39-20 LM Process Yellow 1200	80-300518-0.2730	4	No	Yes	Yes
39-20 LM Orange 1600	81-700218-1.2730	4	Yes	Yes	No
39-20 LM Warm Red 2050	81-801017-5.2730	4	Yes	Yes	No
39-20 LM Warm Red lightfast 2051	81-801016-7.2730	6-7	Yes	Yes	Yes
39-20 LM Red 032 C 2150	81-801018-3.2730	5	Yes	Yes	Limited
39-20 LM Process Magenta C	80-801004-5.2730	5	Yes	No	No
39-20 LM Rubine Red 3001	81-801073-8.2730	4	Yes	No	No
39-20 LM Rhodamine Red C 4500	81-801072-0.2730	4-5	Yes	Yes	Yes
39-20 LM Purple C 5000	81-100271-6.2730	4-5	Yes	Yes	Yes
39-20 LM Violet 5300	81-100270-8.2730	6-7	Yes	Yes	Yes
39-20 LM Process Cyan 5605	80-110885-3.2730	7-8	Yes	No	Yes
39-20 LM Blue 072 C 6000	81-110896-8.2730	6-7	Yes	No	Yes
39-20 LM Reflex Blue 6400	81-110895-0.2730	6-7	Yes	No	Yes
39-20 LM Green 7000	81-500360-3.2730	8	Yes	Yes	Yes
39-20 LM Black 9900	81-900397-1.2730	7	Yes	No	Yes
39-20 LM Deep Black 9901	81-900368-2.2730	7	Yes	No	Yes
39-20 LM Blending varnish	81-000240-2.2730		Yes	Yes	Yes

Lacquer:  
Additives:

OPV **85-601854-4.2730** (39-9P-0178)  
 Reactive thinner **85-601859-3.1020** (411-0010)  
 Initiator coloured inks **85-601860-1.1020** (411-0020)  
 Initiator White **81-470149-6.1180** (411-0021)  
 Hardener **71-470074-7.1270** (411-90)  
 Matt paste **81-470300-5.1200**



## 7. Security

### Security-Classification

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

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.*

*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.*