ELIOS

UV Flexo Printing Ink for Foodstuff Packaging

General information

ELIOS inks are suitable for <u>printing on the non-food contact surface</u> of primary and secondary foodstuff packaging requiring a low level of odour and migration.

These inks comply with the following criteria:

1) Formulation and manufacture respecting the "EuPIA Guidelines on printing inks applied to the non-food contact surface of foodstuff packaging"[1].
2) Formulation that minimises both potential migration through the substrate as well as the set-off of the external printed surface on the inner food-contact-surface during stacking or on the reel.

<u>It must be noted that both set-off and migration are strongly dependant on the transformation conditions and the barrier properties of the substrate.</u>

3) Manufacture according to the CEPE/EuPIA Guidelines "Good manufacturing practices for the production of inks used on the non-food contact surface of foodstuff packaging and on articles intended to be placed in contact with food".

In particular, **ELIOS** inks do not contain:

- substances classified as carcinogenic, mutagenic or toxic for reproduction according to CLP Regulation (EC) N° 1272/2008.
- Low molecular weight acrylates
- Low molecular weight photoinitiators and synergists
- pigments which may themselves migrate (in particular Fanal pigments).
- mineral oils.

1. Available on the Website http://www.fipec.org/afei/htm/fr/contact_alim/guide_eupia.pdf

Reminders :
Recommendations relating to the printing of foodstuff packaging

The design of the packaging is paramount to guarantee the conformity of foodstuff packaging with the Framework Regulation 1935/2004/EC.

This is why it is important to comply with the following:

- The substrate must be suitable for the printing of foodstuff packaging. In particular:
  - ✓ The nature of the substrate, and in particular its porosity, facilitates migration to a greater or lesser extent.
  - ✓ The substrate itself may contain potentially migrant chemical substances (for example, recycled paper and cardboard).
  - ✓ The substrate alone may cause change to the organoleptic properties of the packed foodstuff.

- The amount of potentially migrant substances is proportional to the ink load deposited. This is why we recommend “standard” OD or ink film weights. The maximum deposit must not exceed 2.0 g/m² and the risk of set-off must be controlled.

- The machine used must be kept clean and cleaned only with suitable auxiliary products in order to avoid any contamination. **UV driers systems must be cleaned and monitored frequently in order to avoid loss of efficiency.**

- Some applications may require the use of performance additives. The latter must also be compatible with foodstuff packaging printing conditions.

- The packaging compliance may be compromised if the storage conditions are not suitable (temperature, moisture, etc.).

- Article 17 of Regulation 1935/2004/EC requires complete traceability of the materials and objects. This in particular implies the traceability of all consumables used, the recording of the printing conditions and the identification of the final recipients.

Responsibility

The packaging manufacturer and the packer are legally responsible for the properties of the foodstuff packaging and for its compliance with the legal requirements.

Compliance of the packaging (in particular with Article 3 of Regulation 1935/2004/EC) must be checked by the printer by means of representative analytical measurements (migration tests and organoleptic tests). The Brancher company is committed to provide the relevant information (identification of the components whose migration must be evaluated), under a confidentiality agreement to an external analysis laboratory, or even a third party involved in compliance control.

It is important to know the nature of the packed food as well as the design of the packaging (with an effective functional barrier or not). Knowledge of the nature of the packed element will make it possible to select the suitable protocol to carry out the migration tests (please refer to Regulation 10/2011/EC(1)) as well as pigments with particular resistance if necessary.

Table 1

List of food simulants

Food simulant	Abbreviation
Ethanol 10 % (v/v)	Food simulant A
Acetic acid 3 % (w/v)	Food simulant B
Ethanol 20 % (v/v)	Food simulant C
Ethanol 50 % (v/v)	Food simulant D1
Vegetable oil (*)	Food simulant D2
poly(2,6-diphenyl-p-phenylene oxide), particle size 60-80 mesh, pore size 200 nm	Food simulant E

(1) : http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:012:0001:0089:EN:PDF

ELIOS

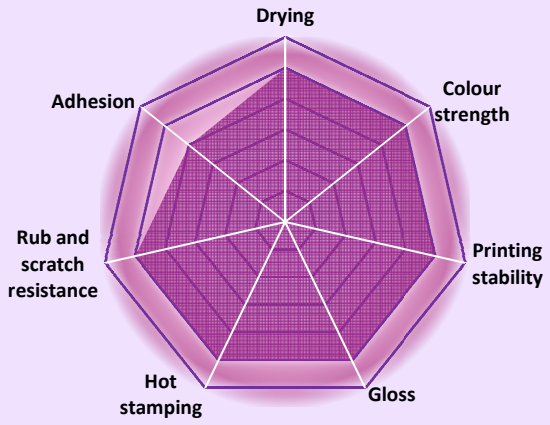
UV Drying Flexo Ink – Suitable for primary Foodstuff Packaging
Labels and flexible packaging

Performances

- Ink in conformity with EuPIA Guideline on Printing Inks applied to the non-food contact surface of food packaging materials and articles
- Fluidity, rheology suitable for a good transfer,
  - > Stability on press
- Good color strength, good gloss, smooth print
  - > High print quality
- Good rub and scratch resistance
- Excellent cure speed

High speed compatibilty

Ink profil



Substrates

Non Coated	**	PE, PP TC	**
Coated	***	PE, PP	*
Cardboard	***	PVC	*
Thermal Eco paper	▲	BOPP	**
Thermal coated	**		

*** *Perfectly suitable*
** *Suitable*
* *Test necessary*
▲ *Prohibited*

ELIOS

		Fastness		
		Light ISO 2835	*Alcohol ISO 2837*	*Alkali ISO 2838*
	Process Yellow Elios	5	+	+
	Process Magenta Elios	5	+	-
	Process Cyan Elios	8	+	+
	Process Black Elios	8	+	+
	Light Fast			
	Yellow LF Elios	6	+	+
	Magenta LF Elios	7	+	-
	Other products			
	Intense Black Elios	8	+	+
	Opaque White Elios	8	+	+
	Op. White Reverse Elios	8	+	+

ELIOS series

		Fastness		
		Light ISO 2835	*Alcohol ISO 2837*	*Alkali ISO 2838*
	Yellow P Elios	5	+	+
	Warm Red LF Elios	5	+	-
	Red 032 Elios	6	+	+
	Rubine Red Elios	5	+	-
	Rhodamine LF Elios	7	+	+
	Purple LF Elios	7	+	+
	Violet LF Elios	8	+	+
	Blue 072 SL Elios	8	+	+
	Reflex Blue LF Elios	8	+	+
	Prosess Blue Elios	8	+	+
	Green Elios	8	+	+
	Mixing Black Elios	8	+	+
	Transp White Elios	.	+	+

Spot colour inks

On request

Packing

5 kg UV Bucket with spout

Recommendation on substrates

- Curing speed of the ink may be reduced by too porous substrates and may cause phenomena of marbling: the very fluid ink is quickly absorbed by the substrate.
- The thermal Eco paper have no protective layer, the thermosensitive layer may react with certain materials of UV inks.
- To obtain a good adhesion, the surface energy of the substrate must be adequate. In the case of synthetic substrates, the required surface energy must be at least 38 dynes/cm².
- A « Corona » electric treatment allows the surface energy of a substrate to be modified and increased. The effectiveness of this treatment is limited over time : we recommend in-line “Corona” treatment.
- Synthetic substrates PE, PP, PVC without top coating contain lubricants that can migrate to the surface. This fact affects the adhesion and scratch resistance, even when the surface tension is correct.

Auxiliary products

UV LOLM additives	*Characteristics*	*Dose*
Thinner UV A1495	Reduces ink viscosity	0 à 3 %
Slip Additive UV A1443	Makes the prints slip. This additive is not suitable for stamping	0 à 2 %
Anti Foam UV A1496	Removes and reduces the formation of bubbles. It is important to homogenize the ink after the addition of this additive in order to prevent deformities on the printed film	0 à 1 %
Photoinitiator A1497	Improves ink drying. Before adding Photoinitiator, check the condition and efficiency of the lamps (number of hours of use of the lamp) and the reflectors cleaning.	0 à 2 %

THE ADD OF AUXILIARY PRODUCTS, EVEN DEDICATED TO FOODSTUFF PACKAGING, CAN CHANGE MIGRATION AND ODOUR PROPERTIES SO IT SHOULD BE INCLUDE in THE RISK EVALUATIION.

Use

- **Anilox**

	Process	**Pantone**	**Texts, Solid**	**White**
Line count anilox				
Lines / cm	480 – 250	210 – 160	210 – 120	160 – 100
Lines / pouce	*1220 – 700*	*500 – 400*	*500 – 300*	*400 - 250*
Cells size				
Volume (cm3/m²)	2,5 – 4,0	5,0 – 7,0	5,0 – 10,0	7,0 – 12,0
Volume (BCM)	*1,4 – 2,5*	*3,2 – 4,4*	*3,2 – 6,3*	*4,4 – 7,1*
Cells engraving angle				
Angle (°)	60	60	60	60
Corresponding transfer*				
Theoretical weight of ink film (g/m²)	0,6 – 1,2	1,5 – 2,1	1,5 – 3,0	2,1 – 3,6

- In order to keep a regular ink thickness, the use of a doctor blade is recommended
- The ink must be stirred before use to obtain an optimum fluidity.

* The diversity of existing anilox is so large, that the correspondances between line count, cell size and transfer are approximate. The depth, opening or the geometry of the cells may affect the transfer.

- **UV Lamps**

- A minimum power of 160 W/cm is recommended. A higher power will permit to increase the printing speed.
- It is important to maintain regularly UV drying systems (reflectors cleanliness and number of hours of use of the lamps) to avoid losing power and thus drying efficiency.
- **A lack of curing of inks and varnishes increase the risk of migration**

- UV Varnish

- Use only foodstuff compatible varnishes as: **VARNISH ELIOS 45 GLOSS**, **GLOSS GLUABLE** or **MATT** *(please look at TDS of VARNISH ELIOS 45).*

Recommendations

- May be laminated and varnished (UV, nitrocellulose, acrylic) with products dedicated for foodstuff packaging
- No direct food contact.
- Use only auxiliary products (thinner, cleaner…) dedicated for foodstuff packaging
- To obtain pastel shades, add maximum 15% of Opaque White and make up with Transparent White.
- In the case of laser overprinting, it is recommended to print 50% half tones rather than solid print areas
- Opaque White can be printed on the front of the substrate, the first group and can be overprinted.
- Reverse White (Cello Email) is used on the last group for printing on the back of a sleeve over other inks. It provides a better rub and scratch resistance but is not suitable for overprinting or stamping."
- Do not use Reverse Opaque White as a mixing shade.
- Opaque White is not suitable for thermal overprinting. Indeed, these types of pigments may damage the printing heads.
- Store the ink in its original, sealed container in a dark place at a temperature between 5 and 30°C. Use within 24 months.
- The packing in its final state should be evaluated to verify its conformity.