Flexocure FORCE™

Flexocure FORCE™
- **is a UV curing flexo ink with excellent rheology, superb print and superior press performance**
- **is recommended for printing on most paper and synthetic label substrates**
- **is available in 4 colour process set, Pantone basic shades, in two strength versions, opaque white and high resistant basic shades**

Application areas

Flexocure FORCE™ is developed as a general purpose UV flexo product for self adhesive applications, including wrap around labels, tickets/tags and boards.

For Non-food packaging applications all UV inks are suitable and recommended for use.

For labels to be applied to food packaging UV inks can be used wherever the substrate materials provide sufficient barrier properties.

- Example of functional barriers: glass container, metal can, and tested plastic structures.
- Industry tests for typical food label constructions – many found photo-initiators to be below limits.

Flexocure FORCE™ was not specifically developed for food packaging applications or other areas where low migration is a requirement.

Flint Group can provide true low migration alternative products.

If uncertain what is appropriate for your application, please contact your local Flint Group representative for more information.

Technical specifications

Printing presses
Flexocure FORCE™ will work on narrow and mid web flexo presses, provided they fulfil the conditions mentioned in this data sheet.
Flexocure FORCE™ has been engineered to work in traditional open Flexo units as well as chambered doctor blade systems with high demand on rheology and foam control.

Printing conditions
The following parameters are recommended when printing with Flexocure FORCE™:

Parameter		Pantone® UFO	Pantone® UFR	Solids	Process 82 range	Process 83 range
Anilox (metric)	Lines/cm	160-180	300-500	120-180	300-400	400-500
	Vol cm^3/m^2	5-6	3,5-5	5-10*	3-4	2-3
Approx film weight (g/m^2)		1,6-1,8	1,0-1,5	1,6-3,0	0,6-0,9	0,5-0,7
UV Lamp	W/cm	160	160	160	160	160
Print speed	m/min	150	100	120	150	150

* only suitable for opaque white, due to its density

Many other factors can affect the final printed result. We always recommend to finger print any new designs or presses to determine the conditions required before starting commercial runs with Flexocure FORCE™.

For recommendations of plates, tapes and UV lamps please refer to our UV flexo printing advice Technote.

Physical properties
Flexocure FORCE™ is available press ready, combining easy handling with optimum press and print performance.

Shelf life
Flexocure FORCE™ has a 12-month shelf life guarantee. This guarantee covers 12 months from the date of manufacture (manufacture date is found on label).
It is important to stir Flexocure FORCE™ before use to ensure product homogeneity.
For further details, see Health, Safety and handling.

Combination printing
Flexocure FORCE™ is suitable for printing in combination with any other Flint Group Narrow Web product.
Depending on the print order and product chosen, the use of additives may be required for an optimum result. Please refer to page 3 for details.

For best combination printing results, the following Flint Group Narrow Web products should be used:

- UV Flexo — Flexocure IVORY™
  Flexocure EBONY™
  Flexocure GEMINI™
- Water based Flexo — Hydrofilm 4000™
- UV screen — UvoScreen Elite™
  CombiWhite™
- UV Flexo varnish

For further technical information, please refer to the individual, product-related Technical data sheet.

Variable Information Printing (VIP)

Flexocure FORCE™ is suitable for use in most VIP applications. Due to the wide range of materials in use, we recommend to speak with your local Flint Group Narrow Web technical contact for specific recommendations.

Flexocure FORCE™ has been developed for excellent acceptance of Hot/Cold foil and Thermal transfer Ribbon.

The printing conditions used with Flexocure FORCE™ may also affect the acceptance of VIP. We recommend testing specific combinations before starting the print run. In some applications, best results are obtained when a suitable varnish is applied.

We do not recommended to use opaque white, metallic or fluorescent inks or products containing matting agents in combination with thermal printing, as these can cause excessive wear to the print head.

Materials recommendations

Flexocure FORCE™ is tested and found to be suitable on a wide range of materials including:

- Cast Coated papers
- Machine Coated papers
- Uncoated paper
- Top Coated thermal paper
- Polyethylene (PE)
- Top Coated PE
- Polypropylene (PP)
- Top Coated PP
- BOPP

We do not recommend Flexocure FORCE™ for use on non-coated thermal papers. For this application we recommend Thermokett TC™.

For most synthetic materials, a surface energy of 38-45 dyne/cm is required to achieve good adhesion. Corona treatment in line is recommended for best results.
Due to the variation between material types from different suppliers, we recommend to follow any specific recommendations from your supplier. We further suggest to always test new materials before starting a new design.

Resistance properties

Flexocure FORCE™ will obtain optimal resistance properties 24 hours after printing, assuming correct cure conditions have been followed.

Full details of resistance properties for each product are shown on page 4 and 5.
In each scenario, the following test methods have been used:

- Lightfastness   ISO 12040:1997
- Solvent, Soap,   ISO 2836:2004
  Grease, Alkaline

Lightfastness figures and all resistance properties are based on the supplier information for each of the pigments used as well as experience from internal standardized tests.

Where lightfast shades are required, we recommend using Flexocure FORCE™ High Resistant shades.

General

Flexocure FORCE™
- is formulated in compliance with the EuPIA Exclusion policy for printing inks and related products, dated September 2015
- will enable the toy to comply with the extractability requirements of EN 71 – part 3 (Directive 88/378/EEC) and TPCH (Toxics in Packaging Clearing Houses – previously CONEG).
- can meet European requirements with regard to migration, but this is dependent on the packaging structure. Therefore, the person placing the package on the market should carry out an assessment of the final package with regard to suitability, since they have the ultimate responsibility for compliance.

Health, Safety and handling

Flexocure FORCE™
- optimal storage conditions is around 15-20°C (60-70°F).
- should not be exposed to direct sunlight or heat.
- should not be allowed to freeze.
- should not be mixed with any other UV, WB or conventional ink.
- waste should be sent for incineration.
- is classified as an irritant, and therefore all skin and eye contact should be avoided. Personal protective equipment including protective clothing and gloves should be used. We recommend nitrile disposable gloves, but you should check with your supplier for suitability in contact with UV materials.

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Please refer to the SDS for full and latest labelling information.

Printing advice

Additives

- **UAA00117 UV adhesion promoter**
  A 3-5% addition may improve the adhesion to PP, PVC, metallised and other difficult substrates. If more than 5% is required, we recommend to add additional photo initiator.
  NOTE: Adding high levels into the base ink can affect the Overprintability.

- **UAA00001 UV antifoam**
  0,5% may help reduce foaming on the press. This should be carefully added and it is important that it is thoroughly mixed into the ink.

- **UAI00109 UV initiator for Dark shades**
  Max 3% may be added to increase the curing speed of dark shades. It will discolour opaque white or light shades ink.

- **UAI00091 UV initiator for Light shades**
  Max 3% may be added to increase the curing speed of opaque white and pastel shades.

- **UAR00102 UV reducer**
  An addition of 1% will reduce viscosity by 5-10%. If more than 5% is added, we recommend to add additional photo initiators.
  Do not use varnishes as reducers, as they can slow down the curing speed.
  The addition of reducers may also help flow out on difficult substrates.

- **UAS00100 UV silicone additive**
  An addition of 1% will lower the surface tension and also improve the flow-out. This additive may be required when printing over silicone containing products.
  NOTE: Adding high levels into the base ink can affect the Overprintability.

UV varnishes
The use of UV varnishes may improve the chemical and rub resistance of Flexocure FORCE™.
Acceptance of VIP may also be further improved when a suitable UV varnish is applied.
Please refer to our technical data sheet for UV varnishes for suitable products.

Cleaning
- As long as Flexocure FORCE™ is not exposed to UV light, direct sunlight or excessive heat, it will not cure in the press.
  Therefore it is not necessary to wash the press immediately after printing.
- To clean rollers, plates and other equipment, our washing liquid CLU00100 should be used. CLU00100 will dissolve Flexocure FORCE™ quickly and easily. Adding a small amount of ethanol can increase the rate of evaporation. To our knowledge, CLU00100 does not affect EPDM rollers or printing plates.

Troubleshooting
- For specific troubleshooting advice when printing with Flexocure FORCE™ please refer to our trouble shooting guide.
- For colour matching advice please refer to our support databases. These are available from your local Flint Group Narrow Web technical representative.

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Standard Product Overview

Shade		Article number	Light fastness	Opacity	Solvent resistance	Soap resistance	Grease resistance	Alkaline resistance
Standard process	Process Yellow	UFO10082	4	Semi transparent	+	+	+	+
	Process Magenta	UFO30082	4	Transparent	+	-	+	-
	Process Cyan	UFO50082	7-8	Transparent	+	+	+	+
	Process Black	UFO80082	7-8	Opaque	+	+	+	+
HD Process	Process Yellow	UFO10083	4	Semi transparent	+	+	+	+
	Process Magenta	UFO30083	4	Transparent	+	-	+	-
	Process Cyan	UFO50083	7-8	Transparent	+	+	+	+
	Process Black	UFO80083	7-8	Opaque	+	+	+	+
Standard Pantone shades	Transparent White	UFO00061	-	Transparent	+	+	+	+
	Yellow	UFO10031	4	Semi transparent	+	+	+	+
	Orange 021	UFO20033	4	Semi transparent	(-)	(-)	+	+
	Warm Red	UFO30001	4	Transparent	(-)	-	+	-
	Red 032	UFO30032	4	Transparent	(-)	(-)	+	+
	Rubine Red	UFO30002	4	Transparent	+	-	+	-
	Rhodamine Red	UFO30003	3	Transparent	-	-	+	-
	Purple	UFO40011	3	Transparent	-	-	+	-
	Violet	UFO40013	3	Transparent	-	-	+	+
	Blue 072	UFO50072	7-8	Transparent	+	+	+	+
	Reflex Blue	UFO50021	7-8	Transparent	+	+	+	+
	Process Blue	UFO50022	7-8	Transparent	+	+	+	+
	Green	UFO60051	7-8	Transparent	+	+	+	+
	Black	UFO80071	7-8	Opaque	+	+	+	+
Other Basic shades	Text & Line Black	UFO80020	3-4	Opaque	+	-	+	-
	Opaque White	UFO90091	7-8	Opaque	+	+	+	+

Light fastness (Blue wool scale)
8 = excellent
1 = very poor

Resistance scale
+ = very resistant
(-) = adequate resistance (3 on a 5 point scale)
- = poor resistance

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Shade		Article number	Light fastness	Opacity	Solvent resistance	Soap resistance	Grease resistance	Alkaline resistance
High Strength Pantone® shades	Yellow	UFR10031	4	Semi transparent	+	+	+	+
	Orange 021	UFR20033	4	Semi transparent	(-)	(-)	+	+
	Warm Red	UFR30001	4	Transparent	(-)	-	+	-
	Red 032	UFR30032	4	Transparent	(-)	(-)	+	+
	Rubine Red	UFR30002	4	Transparent	+	-	+	-
	Rhodamine Red	UFR30003	3	Transparent	-	-	+	-
	Purple	UFR40011	3	Transparent	-	-	+	-
	Violet	UFR40013	3	Transparent	-	-	+	+
	Blue 072	UFR50072	7-8	Transparent	+	+	+	+
	Reflex Blue	UFR50021	7-8	Transparent	+	+	+	+
	Process Blue	UFR50022	7-8	Transparent	+	+	+	+
	Green	UFR60051	7-8	Transparent	+	+	+	+
	Black	UFR80071	7-8	Opaque	+	+	+	+
HR Pantone® shades Standard Strength	Yellow	UFO10035	7-8	Semi transparent	+	+	+	+
	Orange 021	UFO20025	7-8	Semi transparent	+	+	+	+
	Warm Red	UFO30007	7-8	Semi transparent	+	+	+	+
	Red 032	UFO30014	7-8	Transparent	+	+	+	-
	Rubine Red	UFO30016	7-8	Semi transparent	+	+	+	+
	Rhodamine Red	UFO30009	7-8	Transparent	+	+	+	+
	Purple	UFO40012	7-8	Transparent	+	+	+	+
	Violet	UFO40010	7-8	Transparent	+	+	+	+
HR Pantone® shades High Strength	Yellow	UFR10035	7-8	Semi transparent	+	+	+	+
	Orange 021	UFR20025	7-8	Semi transparent	+	+	+	+
	Rubine Red	UFR30016	7-8	Semi transparent	+	+	+	+
	Rhodamine Red	UFR30009	7-8	Semi transparent	+	+	+	+

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