Product: Opus
Series: FLX™

DESCRIPTION: FLX Opus is a **high-elongation, NVP-Free, single-package UV ink** system formulated specifically for premium outdoor-grade pressure-sensitive PVC films. FLX Opus was developed to give superior exterior performance on difficult application surfaces, such as corrugated and riveted surfaces, and is resistant to edge curl of pressure-sensitive vinyls during outdoor exposure. FLX Opus has superb flexibility combined with very high elongation.

EXTERIOR DURABILITY: FLX Opus is formulated to withstand exterior exposure of 3-5 years[1] when properly printed and applied. FLX is resistant to edge curl and has excellent overall exterior durability. For best results, it is advisable to print full strength FLX Opus at the highest practical ink deposit onto premium exterior-use pressure-sensitive materials.

[1]-Based on accelerated weathering tests simulating exposure to Northern USA and Middle European temperate climates.

Exterior Durability NOTE #1: For applications where maximum exterior durability is required (5+ years), our Opus XL ink series is recommended. Refer to the Opus XL Product Data Sheet for further details.

Exterior Durability NOTE #2: For all applications where exterior durability is required, use FLX-C501 Super Overprint Clear.

Exterior Durability NOTE #3: As a general rule, the exterior durability of blue, green, black and white screen inks surpasses that of yellows, oranges and reds. This is due to inherent differences between various chemical types of exterior-durable pigments.

EDGE CURL: This is a curl effect associated with prints of UV ink on pressure-sensitive vinyls and certain other pressure-sensitive substrates when ink is bled to the edge. The curling of the substrate at the edge can cause a separation of the pressure-sensitive film from the surface to which it has been applied, which may subsequently lead to the entire pressure-sensitive film becoming detached. FLX Opus has been formulated to overcome this problem. For best results it is advisable to minimize the ink deposit printed to the film edge, and to select the proper vinyl film for any specific outdoor application. Care must be taken to utilize correct surface-preparation and mounting techniques for optimum results.

SUBSTRATES: FLX Opus is primarily formulated for use on premium grade pressure-sensitive PVC films. It has also exhibited some success on rigid PVC, Polycarbonate and most top-coated Polyester.

Substrate NOTE #1: Although FLX Opus has been successfully used on Polycarbonate and top-coated Polyester films, occasionally adhesion will deteriorate on aging due to a combination of factors which include: substrate grade, ambient conditions while printing, excessive pre-exposure of polycarbonate on a UV dryer, and degree of cure.

Substrate NOTE #2: The application of ink to some plastic substrates may occasionally produce an ink/substrate laminate which will not meet brittleness or flexibility requirements, resulting in cracking of the ink/substrate during subsequent print handling. This effect can be avoided by using a less susceptible, higher gauge, more flexible substrate and minimizing overall ink deposit.

Substrate NOTE #3: Pretest all substrates for adequate adhesion, impact resistance and product resistance before use in production.

APPLICATION OF PRINTED SUBSTRATES: After decoration, substrates will usually be mounted on various outdoor vehicle or graphic sign displays. Before mounting, please consider the following ambient temperature restrictions:

- On **flat surfaces,** apply the printed substrate at temperatures above 40°F (4°C), to reduce the risk of failure caused by diminished elongation properties of cured ink films at lower temperatures.
- On **corrugated surfaces,** apply the printed substrate at temperatures above 50°F (10°C), to reduce the risk of failure caused by diminished elongation properties of cured ink films at lower temperatures.

NOTE: These temperature application recommendations are made with regards to the performance of cured ink films. Substrate manufacturers often have their own restrictions pertaining to the performance of their films. Please review and consider substrate manufacturer temperature restrictions in addition to the one's associated with cured ink films, prior to mounting.

MODIFICATION: FLX Opus is a single-package ink which does not require the use of any additives under normal printing conditions, apart from 3-10% by weight of ST-350 Viscosity Modifier to adjust viscosity. The following additive is available for modification to counteract adverse processing conditions.

- ST-370 Cure Accelerator: 1-3%.

NOTE: Overdosage of this additive may cause problems during further processing and application.

PROCESS COLORS: FLX Opus 4 color process inks are available as high color-strength SWOP colors.

FLX-TPL or FLX-TPS Transparent Pastes may be used to adjust density. As with all UV halftone printing, plain-weave mesh counts and thin stencil coatings should be used to minimize ink deposit, dot gain and other variables associated with 4-color process printing.

SunChemical Corporation
2445 Production Drive
St. Charles, IL 60174 U.S.A
Tel: 1-800-333-INKS
www.sunchemical.com

Product: Opus
Series: FLX™

CURING: Generally, a typical 10-12 micron deposit of an FLX Opus color achieved with a 390/in. (150/cm) mesh will require a UV exposure of approximately 250-500 mJ/cm², as measured with an IL390 International Light Radiometer. Opaque blacks and whites will require significantly more irradiation to successfully cure.

Actual cure speeds will vary, depending on: ink color, mesh, ink film deposit, opacity, number of color components (in a color blend), and type of UV lamps, in addition to a wide range of other processing parameters. Belt speeds as high as 60 ft/min (18 m/min), with two lamps at 200 watts/in. (80 watts/cm), can be achieved, dependent on these variables.

Ink adhesion can only be achieved if the UV ink film is adequately cured. Substrates have differing receptivity to UV ink, and on certain rigid and/or colored materials it may be necessary to cure ink more effectively to achieve satisfactory adhesion.

SQUEEGEE: Sharp urethane squeegee of approximately 75-85 durometer. **Sun Chemical has the best squeegee for your particular application. Contact your local Sun representative for details.**

SCREEN MESH: 305-420/in.(120-165/cm) monofilament polyester mesh, or finer is suitable for processing. It is possible to use coarser fabrics; however, the curing parameters must be adjusted for sufficient cross-linking of the increased ink film deposit. **Sun Chemical has the mesh best suited for your particular printing requirements. Contact your local Sun representative for details.**

COVERAGE: When printed through a 380/in. (150/cm) twill-weave mesh, FLX Opus will cover approx. 3000 square feet per gallon, depending on printing variables. Higher coverage can be achieved with finer mesh counts.

STORAGE: When stored in black polyethylene containers at temperatures between 40-90°F (5-32°C), FLX has a shelf-life of 36 months.

WASH-UP: Sun Chemical has a variety of wash-ups including ECO friendly screen washes available for your particular needs. Contact us for *all* of your pre and post-press chemical requirements.

HEALTH AND SAFETY: FLX Opus is formulated to be NVP-FREE. As with all inks, gloves and safety goggles should be used when handling this product. For more complete information, refer to the relevant **Material Safety Data Sheets**.

SunMatch™ Blending Colors:		Process Colors:		Standard Products:	
FLX-Y30	Primrose	FLX-S231	SWOP Process Yellow	*FLX-C501	Super Overprint Clear
FLX-Y50	Golden Yellow	FLX-S235	SWOP Process Cyan	FLX-N501	Opaque Black
FLX-O50	Orange	FLX-S240	SWOP Process Magenta	FLX-W501	Opaque White
FLX-R20	Scarlet	FLX-S271	SWOP Process Black	**NOTE**: For all applications where exterior durability is required, FLX-C501 Super Overprint Clear must be used.	
FLX-R50	Red	FLX-TPL	Long-Flow Transparent Base		
FLX-M50	Magenta	FLX-TPS	Short-Flow Transparent Base		
FLX-V50	Violet			In accordance with information received from suppliers, the full FLX series is formulated without heavy metals and complies with: 16 CFR, Part 1303; ANSI Z66.1-1964; ASTM F 963; CONEG packaging regulations; EC Packaging Waste Directive EC/94/62; EN71, section 3; RoHS 2002/95/EC; WEEE 2002/96/EC; E2003/11/EC.	
FLX-B50	Blue	Modifiers:			
FLX-G50	Green	ST-350	Viscosity Modifier		
FLX-N50	Blending Black	ST-370	Cure Accelerator		
FLX-W50	Blending White				
FLX-E50	Mixing Clear				

SunChemical Corporation
2445 Production Drive
St. Charles, IL 60174 U.S.A
Tel: 1-800-333-INKS
www.sunchemical.com

working for you.

SunChemical®
a member of the DIC group