

Product: Revolution

Series: REV™

DESCRIPTION: REV is a fast curing, multi-purpose UV ink system for use on a wide range of substrates.

PRODUCT FEATURES:

- Suitable for use on a comprehensive range of multi-purpose display substrates.
- Excellent outdoor durability.
- Optimized for use on in-line presses.
- Can be used with Sun Chemical's Ink Dispensing Equipment and Formulator Scales.

SUBSTRATES: REV is suitable for printing on the following substrates: ¹corona-treated polyethylene banner material, styrene, treated or top-coated mylar/polyester, corona-treated coroplast, corona-treated high density polyethylene sheet, coated paper & board, rigid vinyl, ²pressure-sensitive vinyl, ABS, PETG, acrylic, polycarbonate, anodized aluminum, and some coated metals.

¹In most cases, REV inks will exhibit good adhesion on corona-treated polyethylene banner material. However, when used for more stringent end-use requirements, under more demanding processing conditions, or with less receptive substrates, it may be necessary to add 3% ST-373 Adhesion Promoter to REV inks before use. It is also recommended that prints made with REV inks be allowed a 24 hour post-cure before sewing or finishing (see *MODIFICATION* section, below, for more details on the use of ST-373 Adhesion Promoter).

Pretest all prints made on polyethylene banner material for flexibility & adhesion prior to commencing full scale print run.

²The edges of prints on pressure-sensitive vinyl can curl when subjected to outdoor exposure if the following precautions are not taken: choose substrates recommended for long-term outdoor use; avoid pressure-sensitive substrates with low-tack adhesives; leave a small, unprinted border around the edge of prints; minimize total ink deposit, especially to the substrate edge.

NOTE: Sun Chemical's FLX and OPUS XL ink series are recommended for maximum resistance to edge curl on pressure-sensitive vinyl substrates. Please refer to the Product Data Sheets for these products for more information.

NOTE: Due to the risk of plasticizer migration, which can accumulate on the surface of the substrate and compromise ink adhesion properties, REV is not recommended for use on highly plasticized vinyl substrates such as static-cling vinyl and reinforced banner vinyl.

NOTE: Pretest all substrates prior to use in production.

PIGMENTS/LIGHTFASTNESS: Please refer to the *REV Weathering Statement* for full details of expected outdoor durability.

For applications that require additional flexibility, and/or increased outdoor durability, and/or maximum resistance to edge curl on pressure sensitive vinyl substrates, FLX series inks are recommended. See the FLX Product Data Sheet for more details.

PROCESS COLORS:

The following 3 sets of REV 4-color process inks are available:

- REV process colors matched to SWOP standards
- REV process colors matched to EURO standards
- REV High Density process colors
- REV-S171 can be used as the process black for SWOP, EURO and High Density process colors.
- REV-TPS Transparent Base may be used to adjust the density of all 3 sets of process colors.

The special rheology of REV process colors was designed with "LDP" technology, featuring low dot profile and minimal friction drag, maintaining optimum color balance with negligible shift throughout the print run.

As with all UV halftone printing, plain-weave mesh counts and thin stencil coatings should be used to minimize ink deposit and dot gain.

CURING: Generally, a typical 10-12 micron deposit of a REV color achieved with a 380/in (150/cm) mesh will require UV exposure of approximately 200-300 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 of 60-80 ft/min (18-24 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.

When producing double-sided prints, special care must be taken to fully cure the ink film and minimize print temperature before stacking prints, to prevent marring.

SCREEN MESH: 355-420/inch (140-165/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.**

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 recommendations.**

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MODIFICATION: REV is a single-package ink which does not require the use of any additives under normal printing conditions. The following additives are available for modification:

- ST-341 Surface Hardener 5-10% - Under adverse conditions ST-341 can be added to help prevent slight sticking in stacks of freshly cured REV prints (especially double-sided) on heavy plastic substrates (e.g. polystyrene) that may be retaining heat resulting from the UV curing process.

NOTE: ST-341 should not be added where flexibility is a critical requirement.

- ST-350 Viscosity Modifier 3-10%

- ST-370 Cure Accelerator 1-5%

- ST-373 Adhesion Promoter 3% Improves adhesion & water resistance properties. Once ST-373 has been added, the uncured ink remains active for 24 hours, after which time it will lose its enhanced resistance properties and should be discarded. This will not affect cured ink films, which retain enhanced resistance properties indefinitely.

NOTE: Overdosage of these additives may cause problems during further processing.

METALLIC INKS: Most Aluminum and Bronze pigments can be used with REV-E50 Mixing Clear to produce ink with metallic appearance. Typical levels by weight are 15-20% Bronze paste for gold colors and 5-10% Aluminum paste for silver colors.

NOTE: Care should be taken only to use metallic pigments with a particle size sufficiently small to easily pass through the selected screen mesh.

NOTE: Do not exceed 120°F (49°C) when preparing metallic blends. Any blend of REV-E50 with metallic pigment must be considered a two-pack system with less than 24 hours (approximate) pot-life. Only mix sufficient quantities for immediate use.

NOTE: Pretest all metallic blends prior to use in production.

COVERAGE: When printed through a 380/inch (150/cm) plain-weave mesh, REV covers approx. 3000 ft.²/gal, depending on printing variables. Higher coverage can be achieved when finer mesh counts are used.

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

HEALTH AND SAFETY: 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:		SWOP Process Colors:		EURO Process Colors:	
REV-Y30	Primrose	REV-S131	SWOP Process Yellow	REV-E180	EURO Process Yellow
REV-Y50	Golden Yellow	REV-S135	SWOP Process Cyan	REV-E181	EURO Process Magenta
REV-O50	Orange	REV-S140	SWOP Process Magenta	REV-E182	EURO Process Cyan
REV-R20	Scarlet	REV-S171	SWOP Process Black	Modifiers:	
REV-R50	Red	REV-TPS	Short-Flow Transparent Base	ST-341	Surface Hardener
REV-M50	Magenta	High Density Process Colors:		ST-350	Viscosity Modifier
REV-V50	Violet	REV-S231	High Density Process Yellow	ST-370	Cure Accelerator
REV-B50	Blue	REV-S235	High Density Process Cyan	ST-373	Adhesion Promoter
REV-G50	Green	REV-S240	High Density Process Magenta	In accordance with information received from suppliers, the full REV 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.	
REV-N50	Blending Black	Standard Products:			
REV-W50	Blending White	REV-N70	Opaque Black		
REV-E50	Mixing Clear	REV-W70	Opaque White		
		REV-C50	Overprint Clear		

All information on this data sheet is based on Sun Chemical laboratory tests and experience in print shops. Procedures and directions for use of Sun Chemical products (including printing and after-treatment) must be considered as recommendations only, with no warranties expressed or implied. The user of the products described herein is solely responsible for determining suitability of any Sun Chemical product for the particular application. Sun Chemical recommends that all products be pre-tested prior to full-scale production use. This data sheet supersedes all previous publications. Feb. 2009