

Technical Data Sheet

Thermochromic Screen Inks (UV Curable) Reversible Temperature Reactive Material

Thermochromic Screen Inks (UV Curable) is suitable for a wide range of substrates including paper, plastic (polyethylene, TC polypropylene), coated papers and board substrates. The ink is supplied as a 1 part ink system ready formulated and easy to use allowing flexibility in application and optimization in appearance of printed articles.

Colors and Activation Temperatures

The activation temperature is defined as the temperature above which the ink has almost achieved its final clear or light color end point. The color starts to fade at approximately 4°C below the activation temperature and will be in between colors within the activation temperature range. The color change is “reversible,” i.e., the original color will be restored upon cooling.

Colors include Black, Blue, Magenta, Green, Orange, Red, Purple, Brown and Custom Matching is available.

Activation Temperatures can be set anywhere between 10°C through 69°C. It is defined as the temperature above which the pigment has almost (>95%) achieved its final clear or light color end point.

Application

Screen printing ink ideally suited to flat bed screen printing processes and rotary screen units providing the ink is cured (exposed to UV lamps). As with all thermochromic Screen inks, the printed effect is dependent upon several factors including press speed, substrate, drying time/temperature and mesh count.

Product Properties

Adhesion

Thermochromic Conventional UV Cure Screen Ink is suitable for polyethylene, TC polypropylene, paper, coated paper and boards, however, due to the wide variety of substrates it is recommended that this ink be fully evaluated prior to any commercial use.

Rub Resistance

The thermochromic ink exhibits good rub resistance properties. If a high level of resistance is required then a suitable over varnish or laminate can be used.

Over printability/lamination Properties

Thermochromic Conventional UV Cure Screen Inks is best over-printed with UV letterpress, UV offset and UV flexo varnish (additive may be needed). However, an evaluation for compatibility should always be carried out prior to commercial use.

For applications that use a thermochromic ink that is activated at cold temperatures (less than 20°C / 68°F) we would recommend the use of a matt laminate for optimum effect. For warm and hot temperature activation inks (20°C/68°F and above) we would recommend a gloss laminate.

Technical Specifications

Pigment Content:	30% +/- 1.5%
Particle Size:	<6 microns (95%)
Solvent:	N/A
Supplied Viscosity:	9000 – 12000 cps

Light Fastness

Thermochromic inks are inherently susceptible to damage by UV light. They are only recommended for uses in application with minimal exposure to UV light. UV protective varnish should be used to slow degradation caused by UV light.

Light fastness properties of supplied Thermochromic colors are as follows:*

Green 1
Red, Orange & Magenta 1-2
Yellow, Blue, Purple 2
Turquoise 3

*Rating according to measurement on Blue Wool Scale

Heat Behavior

Reversible Thermochromics are showing thermal Hysteresis. This means temperature against color curves on the heating cycle does not match the cooling cycle curve. Thermochromic prints can experience far more than 1000 heating/cooling cycles above their activation temperature. Thermochromics consistently heated up at temperatures above 50°C (122°F) will slowly lose color intensity below the activation temperature.

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Recommended Printing Parameters

Screen Configuration

The optimum screen configuration depends on several factors, the most important of which is the desired opacity and color of the finished product.

The theoretical ink volume of the screen is crucial for matching the desired effect. Using a higher theoretical ink volume will effect the print as follows:

- Below the activation temperature, color intensity is increased
- Beyond the activation temperature, the level of residual color is increased accordingly

	Activated < 20°C Metric / US	Activated > 20°C Metric / US
Recommended Mesh Size	120/310	70/195
Minimum Mesh Size	150/379	150/379

Ink consumption

Typical ink consumption for Thermochromic conventional UV Screen Ink on a 70T mesh is approx. 20g per sqm. When obliterating an image, 2 passes may be required.

Dilution

The printing ink is supplied in a format that is at printing viscosity. Should the ink need to be thinned to suit application then UV thinners such as TPGDA or TMPEOTA should be used. Care must be taken with the use of diluents as thermochromic inks can be susceptible to damage with various reagents. Do not add more than 10% of diluents to the mixture.

Curing

The ink should be cured using conventional UV curing methods.

Cleaning recommendations

After use, screens can be cleaned with a standard general purpose cleaner/screen wash. Use a clean screen free of solvents when printing Thermochromic Conventional UV Cure Screen Ink since thermochromic effect can be affected by the presence of solvents.

Storage and Handling

Shelf Life 3 Months
Do not store in temperatures in Excess of 25°C/77°F
Do not freeze

All Applications using any QCR Solutions Corp products should be thoroughly tested prior to approval for production.

Information in this Product Data Sheet is compiled from our general experience and data obtained from various technical publications. While we believe that the information provided herein is accurate at the date hereof, no responsibility for its completeness or accuracy can be assumed. Tests are carried out under controlled laboratory conditions. Information is given in good faith, but without commitment as conditions vary in every case. The information is provided solely for consideration, investigation and verification by the user. We do not except any liability for any loss, damage or injury resulting from its use (except as required by law). Please refer to the Material Safety Data Sheet before using products to ensure safe handling.