

## Technical Data Sheet

### Thermochromic Screen Inks (Water Based) Reversible Temperature Reactive Material

**Thermochromic Screen Inks** (Water based) for absorbent paper and board substrates. Thermochromic Water Based Screen Ink is supplied as an easily mixed 1 part ink system

#### 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 onto absorbent paper and board substrates for applications such as labels, tags, tickets and boards. As with all Thermochromic inks the printed effect is dependent upon several factors including press speed, substrate, drying time/temperature and mesh count.

The prints exhibit a matte finish. Therefore, it is always recommended that over laminate or spot varnish is used to give a glossy aspect.

#### Printing Recommendations

##### 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 the desired effect. Using a higher theoretical ink volume will increase the intensity of color of the product when below its activation point and also the level of residual color when above its activation point.

	Activated <20°C Metric	Activated >20°C Metric
Recommended Mesh Size	90T	70T
Minimum Mesh Size	150T	150T

Do not allow the ink to sit dormant on the screen as this will cause ‘drying in’ on the screen and affect print definition and quality.

#### Dilution

The printing ink is supplied in a format that once mixed is at printing viscosity. Should the ink need to be thinned to suit application then only water should be used. No alternative thinners should be used as these will affect both the performance of the ink and Thermochromic function. No more than 10% water should be added to the ink system.

#### Technical Specifications

Pigment Content:	24% +/- 1.5%
Particle Size:	<6 microns (95%)
Solid Content:	46% +/- 2.0%
Solvent:	Water
Supplied Viscosity:	>15,000 cps

#### Cleaning Recommendations

Thermochromic Water Based Screen Ink should be cleaned on screen using water only. Glycol based cleaners should not be used as these will damage the function of the ink.

After use screens can be cleaned with water. A high powered water jet may be required to remove all ink remnants.

Use a clean screen free of solvents when printing Thermochromic Water based Screen Ink since the Thermochromic effect can be affected by traces of solvents.

#### Drying

The ink should be dried using hot air dryers or IR lamps set to a maximum temperature of 70°C/158°F. Care should be taken when stacking the finished product as if too much pressure is applied to uncoated ink (not varnished or laminated) offsetting of the print can occur.

#### Ink Consumption

Typical ink consumption for Thermochromic Water Based Screen Ink on a 70T mesh is approx 30 – 35 gms per sqm. When obliterating an image, 2 passes may be required.

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### Storage and Handling

Thermochromic Water Based Screen Inks should be stored away from solvents, sources of UV light and high temperature. Ink should be thoroughly mixed prior to application. Please consult MSDS prior to use.

Shelf Life of Ink 3 Months

Do not store in temperatures in Excess of 25°C/77°F

Do not freeze

### Sensitivity

#### Rub Resistance

An over varnish or laminate is necessary if any resistance to abrasion is required as resistance to pressure is low.

#### Light

Thermochromic inks are inherently susceptible to damage by UV light. They are only recommended for uses in applications where there would be minimal exposure to UV light. Where necessary a suitable 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

#### Adhesion

Thermochromic Water Based Screen Ink is suitable for absorbent paper and boards. Due to the wide variety of substrates it is recommended that this ink is evaluated fully prior to any commercial use.

### Overprintability/Lamination Properties

Both heat and cold set laminates can be used with Thermochromic Water Based Screen Inks. Thermochromic Water Based Screen Inks can be also overprinted with UV offset, UV flexo and UV screen varnish. However an evaluation for compatibility should always be carried out prior to commercial use.

When Thermochromic Water Based Screen Inks are overprinted onto a surface pre-printed with offset ink, it is recommended that the offset ink is wax free. For applications where Thermochromic ink activates at cold temperatures (lower than 20°C/68°F), we recommend the use of a matte laminate for optimum visual effect. For inks activated at warm and hot temperatures (20°C/68°F and above), we recommend a gloss laminate.

### 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.

### 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.