



DATA SHEET

THERMOCHROMIC UV SCREEN INK

DESCRIPTION

CTI's thermochromic UV Screen inks, are colored below a specific temperature, and change to colorless or to another, lighter color as they are heated. The color starts to fade with increased temperature at approximately 4° C below the activation temperature and will be in between colors within this temperature range. The temperature above which the ink stops losing color we refer to as the "Clearing Point". The color change is "reversible," i.e., the original color will be restored upon cooling. As the temperature of the ink is lowered from above the Clearing Point, the ink begins to gain color at about 3 C below the clearing point and continues to gain color until about 6 C below the clearing point. We refer to this as the "Full Color Point". These inks are available in various colors, Clearing Points and Full Color Points. Standard Clearing Points are 15, 31 and 45° C (59, 88 and 113° F). Other activation temperatures are also available, from -5° C to 65° C. See Sales Policies Sheet for a complete list of available colors. CTI's UV Screen ink is ideal for document security, promotional items, temperature indicating labels, packaging, games, novelties, etc. Thermochromic inks are not compatible with many different chemicals. Please do not put anything into CTI's products without first consulting a CTI representative.

TYPICAL PROPERTIES

	<u>Flatbed</u>	<u>Rotary</u>
Viscosity (at 25° C)	65-110 poise	30-60 poise
Density (Approx.)	8.0 lb./gal	8.0 lb./gal
Appearance	Viscous Liquid	Viscous Liquid
Percent Solids (Approx.)	99%	99%
Percent Volatiles (Approx.)	<1.5%	<1.5%
Yield Range (Approx.)	10,000-50,000 in ² /lb. (depending on film thickness)	
Recommended Substrates	Paper, Film	

STORAGE AND HANDLING

CTI's products should be stored in a cool, dry place and away from sources of UV light. The inks are stable when stored away from heat. The material is combustible and should not be used near open flame. Store Below 80° F. Product must be used within twelve months of purchase. Consult MSDS prior to use.

SPECIAL CARE INSTRUCTIONS

CTI's UV screen ink is simple to use, but different from other UV screen inks. The differences between our ink and regular UV screen inks are outlined below. The instructions below should be followed carefully to achieve optimum results.

- Ink-Do not allow CTI UV Screen ink to come in contact with unapproved solvents. To ensure this, always dry the screen completely before adding the ink to the screen. Always be sure that equipment that comes in contact with the ink is completely dry and free of all solvents. Also, when cleaning the screen in the middle of the run, do not allow any solvent to touch the unused ink.
- Mixing-Be sure to stir the ink well before and during use.
- Screen Mesh-A coating thickness of at least 50 microns is recommended for best results, due to the low opacity of thermochromics. Use lower mesh screens with CTI thermochromic ink. Finer meshes may work with some formulations. Coarse screens, such as an 80-150 mesh are required to achieve the heavy laydown necessary to get good opacity. Rotary screen emulsions can be over-exposed to insure best resistance to emulsion breakdown. You may wish to experiment to achieve the best results.



- Artwork- CTI Thermochromic UV Screen is a translucent ink. For best color, print over white or light colors. CTI's Thermochromic UV Screen ink prints as a normal translucent ink, not an opaque ink, and can cover or obscure other solid colors only when printed heavily (2-3 mils).
- Clean Up-Use normal solvents, but be sure screens are dry before adding CTI Thermochromic ink.
- Thinning-CTI has extenders and thinners should you need them. Use CTI approved thinners only.
- Curing-Do not over-cure, to avoid yellowing in the warm state.
- Substrates-This ink will work well with most types of coated and uncoated stocks, as well as many plastics. Compatibility of ink, coating and substrate must be determined prior to production runs.
- Recommend printing CTI's UV Screen ink over ink or coatings that do not contain silicones or waxes.
- Thoroughly test applications where thermochromic ink is die cut or folded to ensure that inks are suitable for a particular application.
- Test adhesion to desired substrate.
- CTI's UV Screen ink cures between 300-400 millijoules.

SENSITIVITY

Thermochromic materials are sensitive to adverse environmental conditions. These are listed below, along with a description of the nature of the sensitivity, and recommendations.

LIGHT: Long exposure to UV and some fluorescent lights can degrade color intensity and changing characteristics of the ink. Extreme exposure of more than several days of direct sunlight may degrade the color of the ink. Several hundred hours of strong fluorescent light may cause a loss of color and poor color change characteristics. In handling these materials assume that they are similar to fluorescent pigments in terms of light stability.

HEAT: Extended exposure to 100° F or higher, can degrade the color change and intensity of the product. Exposure to extreme heat only has an effect if a given temperature is constantly maintained for a given amount of time. If a printed piece were left in an environment where it remained at 100° F for many days, one might then expect to see a reduction in color. At 400° F the time to degradation might be less than an hour. The effect is time and temperature dependent.

CHEMICALS: Thermochromic materials are sensitive to certain chemicals. Since it is unlikely that the printed piece will come into contact with damaging chemicals under normal conditions, this is not a serious concern. The wet ink should not come into contact with any solvents, including wash-up solvents. Be sure that the press is clean and dry before adding CTI's product to it to minimize chemical exposure. Never add solvents to our ink without first speaking with a CTI representative.

CONCLUSION: The ink in both wet and printed forms should be stored in a cool, dry place, away from chemicals and direct light, especially sunlight. Wet ink should be used within twelve months of receiving it.

HYSTERESIS: Reversible thermochromics exhibit what is referred to as "hysteresis" or "thermal memory". If a standard 31C ink is raised to an extreme temperature, then left to cool under normal ambient conditions, the ink may not achieve its full color, even after it reaches room temperature. Once exposed to this kind of temperature "spike," one may need to lower the ink's temperature to below 20° F below the clearing temperature to gain improved behavior. **ALL APPLICATIONS USING CTI's INKS SHOULD BE THOROUGHLY TESTED PRIOR TO APPROVAL FOR PRODUCTION.**

For further information or assistance, please contact Chromatic Technologies, Inc. at (888) 294-4CTI.

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