



B&H Colour Change

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THERMOCHROMIC UV OFFSET INK

DESCRIPTION

Thermochromic offset inks, in printed form, are a pastel colour below a specific temperature, and change to colourless or to another, lighter colour as they are heated through a defined temperature range. These inks are available in various colours and activation temperatures. Standard activation temperatures are 15, 25 and 43° C (59, 77 and 109° F). Other activation temperatures are also available, from -5° C to 65° C. The activation temperature is defined as the temperature above which the ink has completely changed to its final clear or light colour end point. The colour starts to fade at approximately 4° C below the activation temperature and will be in between colours within the activation temperature range. The colour change is "reversible," i.e., the original colour will be restored upon cooling. Offset ink is ideal for document security, promotional items, temperature-indicating labels, packaging, games, novelties, etc.

TYPICAL PROPERTIES

Viscosity	450-750 poise
Percent Solids (Approx.)	90% +/- 2%
Percent Volatiles (Approx.)	<4%
Recommended Substrates	Paper, Film

STORAGE AND HANDLING

The inks have excellent stability when stored away from heat. The material is combustible and should not be used near open flame. Store below 32° C. Ink should be used within six months of purchase. Storage longer than twelve months is not recommended. Consult MSDS prior to product use.

SPECIAL CARE INSTRUCTIONS

- Consult Technical Notes for instructions for use.
- Technical notes are available upon signing a confidentiality agreement. Contact B&H for details.
- Thermochromic UV Offset ink has been run at 1,400 feet per minute for several hours at a time without serious press problems. On certain presses, one may need to stop the press every hour or so to clean the blanket due to piling.
- Though we do offer a magenta ink, thermochromic inks cannot be substituted for process colours. The colour will not be correct for four-colour work.
- The ink can be printed on either side of the CB sheet, or on the uncoated side of the CF. In the case of multi-ply, the ink can be printed on the CFB side. In other words, the ink is incompatible with the CF side of CF paper.

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 with regards to them.

LIGHT: Most significantly, long exposure to UV and some fluorescent lights can degrade colour intensity and changing characteristics of the ink. Extreme exposure of more than several days of direct sunlight may degrade the colour of the ink, though it will probably still change colours. More than 600 hours of a strong fluorescent light may also cause a loss of colour in the thermochromic. This is true of many different pigments and dyes. In handling these materials, a good rule of thumb is to assume that they are about as sensitive to light as fluorescent pigments are.

HEAT: Extended exposure to very high temperatures, i.e., 38° C or higher, can also degrade the pigment. The effect of light exposure seems to be additive over time. However, with heat, the exposure only has an effect if a given temperature is constantly maintained for a given amount of time.

CHEMICALS: Thermochromic materials are sensitive to chemical exposure as well. Since it is very unlikely that the printed piece will come into contact with deleterious chemicals under normal conditions, this should not be of great concern. On the other hand, because of the chemical sensitivity and softness of this ink, it also has excellent anti-alteration properties.

CONCLUSION: In short, this ink should be stored in a cool, dry place, away from direct exposure to light, especially sunlight. This is true of both the printed ink and the wet ink. Ink in the can should be used within six months of receiving it. If the colour or colour reaction is compromised in a security environment, one need only to continue to verify the authenticity of the document by other means; ghost watermark, bleed through inks, etc. We predict that with proper handling, the failure rate of the ink will be less than one half of one percent, and as mentioned above, this means that one need only continue to verify authenticity and not redeem the document for cash until confirmation is established.

NOTE REGARDING HYSTERESIS: Reversible thermochromics exhibit what is referred to as “hysteresis.” In other words, if a standard “Body Temperature” ink is raised to an extreme temperature, say above 65° C (as with a curing unit), then left to cool under normal ambient conditions (18° to 24° C), the ink may not achieve its full colour, even after it reaches room temperature. Although, under normal circumstances the ink should have full colour up to 7-8 degrees below the stated activation temperature, once exposed to this kind of temperature “spike,” one may need to lower the ink’s temperature to below 50° F to gain improved behavior. ALL APPLICATIONS USING COLOUR-CHANGING INKS OF ANY KIND SHOULD BE THOROUGHLY TESTED PRIOR TO APPROVAL FOR PRODUCTION.

For further information or assistance, please contact B&H Colour Change Ltd, +44 (0) 845 458 4121.

DISCLAIMER: 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 at B&H Colour Change 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. B&H Colour Change 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.