

# THERMOCHROMIC INKS

New opportunities with temperature-sensitive, colour-change inks!

Thermochromic inks: for temperature indicators and interactive prints

## APPLICATION

All colored prints which become invisible after warming up

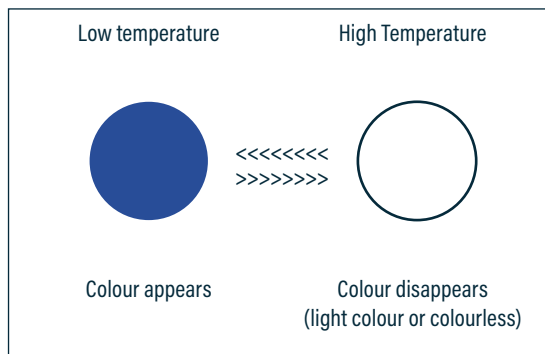
## CHEMICAL NATURE

Thermochromic inks change color depending on the temperature applied to them.

Thermochromic pigments are encapsulated and can change color reversibly.

When the temperature reaches the turning temperature, the hue starts to disappear until the ink becomes almost colorless ( $\pm 2^\circ\text{C}$ ).

As soon as the temperature drops below the turning temperature, the ink returns to its original shade.



The color change temperature range covered by the thermochromic pigments is  $5^\circ\text{C}$  to  $60^\circ\text{C}$ .

## RANGE OF PRODUCTS

Standard temperature ranges include the following two gradients:

Freshness indicator	8-10°C (46.4 - 50°F)
Body heat	31°C (88°F)
Quantity of powder to mix in the bases: 30% by weight	

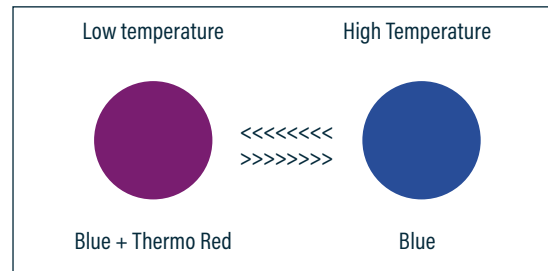
The operating range of the ink is 4 to  $5^\circ\text{C}$  between solid and discolored color.

Standard colours are:

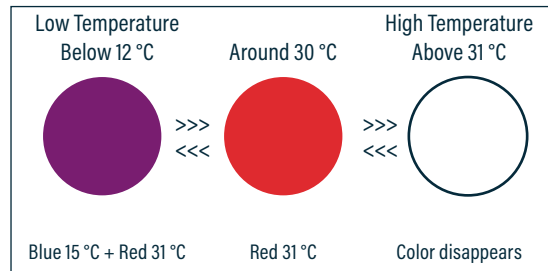
- **Black**
- **Red**
- **Blue**
- **Green**

Colours and temperature responses can be customised upon request.

The only way to change from a colour to another one is to mix a thermochromic colour with a regular one.



By mixing different thermochromic inks with different temperature ranges, it is possible to get an ink with three shade moves.



Opacity of these inks is not very high.

The black ink is the only one to be opaque enough to hide an image/slogan/winning message.

In this case, a minimum desposit with a screen 43 lpcm (110 mesh) is needed.



### SCREENS AND CONSUMPTION

On average, the consumption is between 10 and 15 g/m<sup>2</sup>

For a simple impression (no overprinting), use a screen of 100 to 120 lines/cm.

The consumption will be around 40g/m<sup>2</sup>.

To hide a light print (or fine screen), use a screen of 43 lines/cm.

The consumption will be 100 g/m<sup>2</sup>.

To hide a sustained impression, it will be necessary to apply 2 layers of ink and sometimes even, 3 layers.

### LIGHT FASTNESS

The products used in the composition of the micro capsules are from the family of dyes, the light fastness is therefore quite low (2 to 3.5 depending on the color).



### STORAGE

The guaranteed shelf life of our inks, undiluted, in the original, unopened container is applicable to inks stored in a dry, well-aired environment at a temperature between 15 to 25 °C (59-77 °F).

- Standard UV inks: 1 year
- Standard solvent based inks: 1 year
- Special shades in solvent or UV: 1 year
- Fluorescent colours: 3 months
- Gold and silver: 3 months
- Transparent shades: 6 months
- Special products, hardeners: 1 year

### HEALTH AND SAFETY

The vast majority of printing inks and related products formulated by Encres DUBUIT contain no substances of very high concern (SVHC) candidates for authorization (as of June 25, 2020) in concentrations greater than 0.1% by mass. Our products comply with the requirements of Directives 2011/65 / EU (RoHS 2), 2015/863 / EU (RoHS 3) and 94/62 / EC (heavy metal concentration levels present in packaging). For more information about our regulatory compliance, please consult our Eco System document, available on request.

*Encres DUBUIT guarantees the quality of our products. However, we cannot guarantee the final result, because we exercise no control over individual operating procedures. Our responsibility is limited solely to the exchange of ink or varnish. The quality of a substrate to be printed can vary, as well as an overprinted ink; therefore, the above information is given in good faith based on the state of our art and prior experience. This statement also applies to our technical assistance. When using our inks and varnishes on a new substrate or when changing operating procedures, we strongly recommend testing first a full-scale production to ensure compatibility. Please refer to our General Conditions of Sales.*

