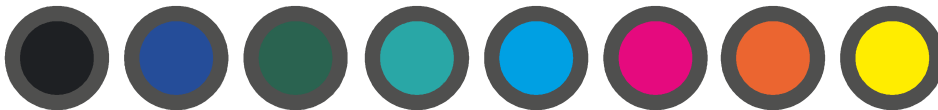


Colours

Chromazone® is coloured in its cold state becoming colourless when heated above its rated temperature. This reaction is reversible.

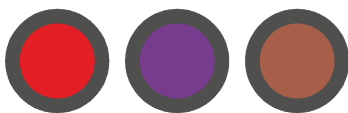
A range of base colours, which is determined by available raw materials, are available:-

Base Colours

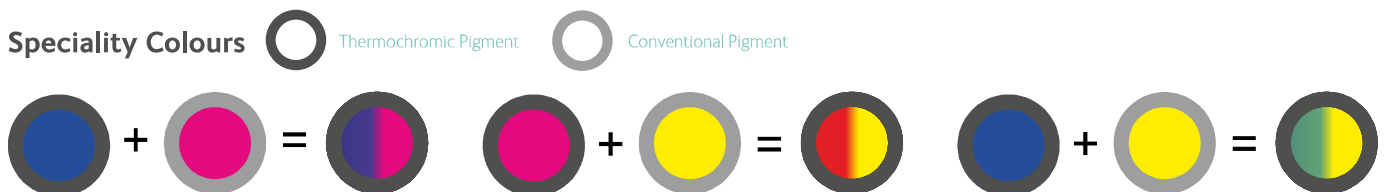


Base colours can be mixed together to give a range of custom colours such as:-

Mixed Colours



Base colours can also be mixed with other standard colours to give special effects such as:-



Properties

Colour Intensity/Opacity:

Chromazone® is a translucent material and as such appears best on a white background. Colour strength is highly dependant on the loading of pigment to binder and the subsequent thickness that is laid down. The colour offering the best opacity is black using a heavy deposit.

Temperature Rating:

Temperature is defined as the highest temperature at which the colour is visible upon heating and can be custom made to anywhere between -10 and 69°C for most colours.

Standard Temperatures and Colours:

Due to the large number of combinations possible we stock 3 of the most popular colours and temperatures which are Black, Red and Blue at 15°C, 31°C and 47°C. Stocks of other colours and temperatures vary (call for current availability).

Products:

Chromazone® is supplied as either an Aqueous Slurry or a Free Flowing Powder. Both are in their pure form and have no additives as standard allowing easier formulation.

Light Fastness:

Thermochromics have generally good lightfast properties in visible light but poor in UV light. Performance varies from colour to colour.

Graphics

Security & Brand Protection

Chromazone[®] can add security and brand protection to many things. These can be interactive so that consumers are involved or concealed in conjunction with other security inks.

- Gift Certificates & Vouchers
- Cash Register Receipts
- Tickets
- Pay slips
- Bus Passes
- Doctor's Prescription Pads
- Proof of Purchase
- Certificates of Authenticity

Labels & Labelling

Chromazone[®] gives a visual display of temperature change.

- Product labelling to indicate correct consumption temperature such as beer, wine, Maple Syrup etc...
- Safety warning to indicate when products are too hot to use or touch such as depilatory wax etc...
- "Smart" labels to show correct storage temperatures for poultry, meat, dairy foods etc...

Promotional

Chromazone[®] is used to create interactive promotions.

- Interactive game cards to indicate whether the customer has won or not
- Magazine adverts and posters where the background changes when touched
- Hidden messages that appear when heated or cooled

Coatings

Chromazone[®] is used in various coatings to create many effects.

- Mugs that reveal images when hot drinks are added
- Paints that change colour when touched by children
- Papers for special effect packaging or brand protection.
- Leathers and textiles to create special effect clothing and footwear.

Plastics

Chromazone[®] used in concentrates to in turn create thermochromic plastics.

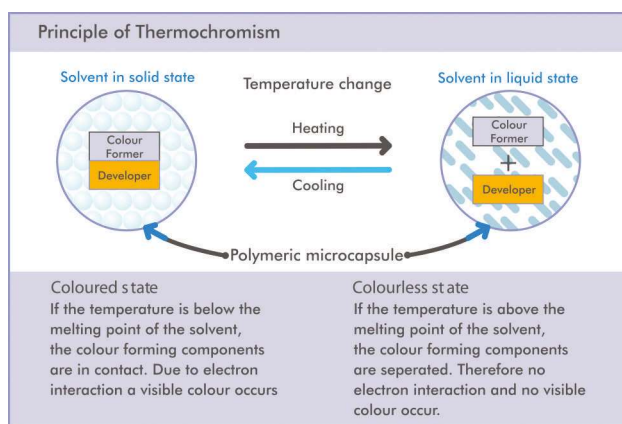
- Drinking Straws that change when cold drink passes through them.
- Baby feeding spoons which change colour if the food is too hot.
- Plugs to show when bath water is too hot.
- Toothbrushes, Pens, Key rings etc... all that change colour in your hand

Principle of Thermochromism:

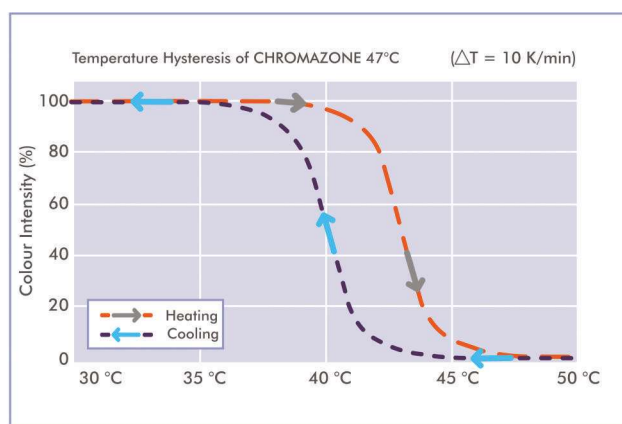
Chromazone® is a microencapsulated chromagenic material with an impervious polymeric wall which produces a thermochromic system which loses its colour when heated and returns when cooled.

Graphic 1 explains the principle of the thermochromic reaction. This reaction can be disrupted by several external influences such as high exposure to UV light, presence of polar solvents, very high temperatures or excessive shear.

Due to their physical and chemical properties the visible colour change of Chromazone® pigments occurs over a temperature range of approximately 5°C and additionally shows a thermal hysteresis. This is where the temperature at which the colour disappears on heating is higher than the temperature at which full colour strength is achieved on cooling and is show in Graphic 2.



Graphic 1



Graphic 2

Formulation

Chromazone® is supplied in two formats:-

Aqueous Slurry

Slurries are ideally suited for water based inks however highly alkaline products (such as ammonia), alcohols and glycols should be avoided when formulating.

As slurries hold the microcapsules in their original particle size, dispersion without high shear is easy and better colour can be achieved.

If a flushing system is available then this should be used with products such as oil based inks for best results.

Free Flowing Powder

Powders have designed to have optimal chemical and solvent resistance for use in UV and Solvent based inks however checks should be made when formulating.

The microcapsules can withstand most standard mixing and application procedures however if too much shear energy is used (e.g. bead mills) the microcapsules can be crushed destroying the thermochromic functionality. Three rolls mills are fine however gaps on the rollers must not be taken below 9 µm.

Full technical data sheets and material safety data sheets (TDS & MSDS) are available for both products on request.

Specifications

Aqueous Slurry

Temperature rating: +/-2°C

Solids: 48% +/- 2%

Particle Size: 90% < 6 µm

pH: 4.9 – 6

Light fastness: 1–3 (BWS) depending on Colour

Powder

Temperature rating: +/-2°C

Solids: 98% +/-2%

Original Particle size: 90% < 7 µm (note particles may agglomerate during powder production).

Light fastness: 1–3 (BWS) depending on Colour

Storage

A shelf life of 2 years is guaranteed provided that their containers are not opened and are stored in an ambient of 16 to 22°C with no exposure to UV (Sun) light.

All raw materials used for production of standard Chromazone® pigments are listed in EINECS, TSCA and DSL/NDL.