



Thermographic Measurements Co. Ltd.



## ChromaZone® Free Flowing Powder Technical Data

### Description

ChromaZone® free flowing Powders are thermochromic microcapsules in the powder form. They have been designed for use in non aqueous binder systems and plastic applications.

ChromaZone® free flowing Powders can be formulated into non aqueous flexographic, UV, Screen, Offset, Gravure and Epoxy Ink formulations. For aqueous applications we recommend the use of our ChromaZone® slurries.

ChromaZone® free flowing Powders are suitable for compounding. We recommend turning the powder into an EVA Masterbatch loaded at 20 % or more with the ChromaZone® free flowing Powders.

ChromaZone® free flowing powders show colour below clearing temperature, and change to colourless or to another lighter color as they are heated through the temperature range. These pigments are available in various colors and at any activation temperatures between -10°C and +65°C.

<b>Standard activation temperatures</b>	15°C, 31°C and 47°C.
<b>Special activation temperatures</b>	Any temperature between -10°C to +69°C.

The activation temperature is defined as the temperature above which the pigment has almost achieved its final clearing 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 below the start of fade temperature.

<b>Standard colours</b>	Black, Blue, Magenta, Green, Orange and Red.
<b>Special custom colours</b>	Yellow, Purple, Brown and other custom colours.

### Special Care and Storage / Handling Instructions

‘ChromaZone® Powders’ are more sensitive to the influences of solvents, UV light, pH, Shear and temperature than many other types of pigment (see sensitivity). It should be noted that there are differences in performance of the various colours so that each individual grade should be thoroughly tested before commercial application.

‘ChromaZone® free flowing powders’ have excellent stability when stored away from heat (Store below 25°C) and light. A shelf life of 12 months is guaranteed provided that the material is stored in a

cool and dark environment and kept in a tightly sealed container. Long term exposure to UV light or elevated temperature can cause loss of thermochromic function. Storage longer than twelve months is not recommended. Please consult product MSDS prior to use.

## **TECHNICAL DETAILS**

<b>Solids</b>	98% +/-2%
<b>Particle Size</b> (measured on the slurry before drying process)	90% < 8µm
<b>Light Fastness (blue wool scale)</b>	1 – 2
<b>Shelf Life</b>	12 months

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

## **SENSITIVITY**

ChromaZone® free flowing Powders are sensitive to adverse environmental conditions. These conditions are listed below.

### **MIXING:**

ChromaZone® ff Powders can withstand most standard mixing procedures. We recommend the use of a triple-roll mill to get optimum dispersion of the ff powder into a binder system. The use of either ball or bead mills can permanently alter the properties of the microcapsules, as the milling process will destroy the capsule wall.

### **LIGHT:**

Long exposure to strong fluorescent light can permanently degrade thermochromic properties of the ff powder. Exposure of more than several days to direct sunlight will permanently affect the Thermochromic properties of the ff powder.

### **HEAT:**

Extended exposure to temperatures higher than 50°C will alter the Thermochromic properties of the pigment.

ChromaZone® thermochromic microcapsules can survive temperatures as high as 200°C, when exposed for a very short periods of time (<10 seconds).

### **CHEMICALS:**

ChromaZone® ff Powder can be incorporated into many types of non aqueous and UV curing formulations. Nevertheless, thermochromic materials are sensitive to chemical exposure. Care must be taken to avoid the use of Ethanol and Ammonia. They can be replaced respectively by isopropanol and substituted ethanolamine. We recommend to run full stability test when the formulation contains polar solvents such as alcohols, acetates, etc... These solvents can permanently damage the microcapsules and permanently alter their colour changing properties.

ALL APPLICATIONS USING COLOR-CHANGING PIGMENTS AND INK OF ANY KIND SHOULD BE THOROUGHLY TESTED PRIOR TO APPROVAL FOR PRODUCTION.

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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 TMC 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. TMC 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.

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