



TM

NINGBO BRISCENT

Thermochromic Pigments

Introduction

Reversible Thermochromic Pigment is made of the charge-transfer organic compounds. Although charge-transfer organic compounds have thermochromic property, they can not be used in printing inks and paints directly, they need to be changed into microcapsules. This particle shape is round and particle size is between 3 and 7 micron, inner of the round particle is thermochromic compounds and outer is about 0.2 to 0.5 micron transparency skin which is insoluble and not melting, this can protect thermochromic compounds from invading by water and other chemical substances.

The color-change temperature of Thermochromic Pigment is not a point, it has a interval. Generally the interval is 4-6°C. The color-temperature curve of temperature heating and cooling process is not coincidence. We usually use the heating method to mark the color-change temperature. Temperature range of our pigments is from -15°C to 250°C.

Colors of Thermochromic Pigments

Rose Red	Scarlet Red	Golden Red	Grass Green	Blackish Green
Malachite Green	Jewelry Blue	Black		

Color Shade: Thermochromic Pigment shade is concerned with particle size. Generally the smaller size is, the lighter color is. Vice versa, the bigger size is, the brighter color is.

Property of inks: Generally the smaller size is, the bigger specific surface area is and the worse liquidity is. Therefore if the small particle size pigment is used, the varnish shall have high content of solid, low viscosity and good liquidity.

Property of solvent resistance: Generally the smaller size is, the thinner skin of microcapsule is and the worse solvent resistance property is.

Application

- 1, During application, add pigment into solvent, which can make the pigment surface wettish. Then slowly add resin liquid and stir by fluted disc type mixer of which shear force is strong at the same time.
- 2, Preparation of thermochromic offset inks:
The usage of Thermochromic Pigment in inks should be 22~23%. If the content is too small, sheet color tint will be low. On the contrary, the content is too high, the properties of inks will become worse and it will get useless.



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- 3, Particle size of Thermochromic Pigment used in inks is small and surface energy is high, it can easily reunite and be difficult to disperse uniformly. Because of the high viscosity, it is easy to destroy microcapsule if we disperse particle by using the high-speed stirring method which is always used in preparation of gravure and silk-screen. We suggest to low-speed roll particle by mangle with the gate loose until particle disperse uniformly.
- 4, It does not contain materials harmful to human body, it can be used in toys and food packaging.

Attention

1. Solvent-base inks: around 5~35%

Choosing resins:

The viscosity and solid content of resins have important effect on color tint and surface gloss of thermochromic inks, especially on black. The content of Thermochromic Pigment in inks is higher than ordinary pigment, in order to reduce ink viscosity, we should reduce the resins and solvent usage. When prepare thermochromic inks, we must use high content and low viscosity (Low polymer molecular) resins. In addition, resins will influence pigment transparency, in general, transparency gets better when using alkyd resin and acrylic resin, and get poor when using polyamide resin and nitrocellulose.

Choosing solvent:

Take following measures when prepare inks and print:

- a. Don't use or less use alcoholic solvents and use other solvents to replace.
- b. Use the ink which is prepared by butanol immediately.

2. Water-base system: around 3~15%

Thermochromic Pigment can use for water-base system. Control PH value from 3 to 7.5.

3. Plastic: around 0.5~3%

Control the processing temperature under 230°C. If we use normal pigments to match colors with Thermochromic Pigment, the usage of normal pigments are about 0.6~2.5% of Thermochromic Pigment.

- 4, **Storage:** Thermochromic Pigments should be kept in a dry place, under room temperature and not exposed to light. It is more stable at color state than non-color state, low temperature Thermochromic Pigment should store in refrigerator.

Package: 1 ~ 5 kg bags with cartons.

Shelf life: 18 months