



THERMOCHROMIC SHEETS AND FILMS CONTAINING MICROENCAPSULATED TLCS

LCR offers a wide range of temperature-sensitive sheets and films containing microencapsulated TLC. Principal application areas for the products include:

- a) Engineering and aerospace research
- b) Medical thermography
- c) General non-destructive testing (NDT) and thermal mapping
- d) Educational demonstrations
- e) Novelties

STANDARD PRODUCTS

Standard sheets use a substrate of 125-micron (5 mil) clear polyester (Mylar, Melinex, etc.). The sheets are printed on one side, first with the microencapsulated TLC coating, then with black backing ink. The color change properties of the TLC coating are viewed through the clear, uncoated side of the sheet. Standard sheets are available with or without, adhesive backing (pressure-sensitive adhesive); the protective release-liner can be removed for easy adhesion to a variety of flat surfaces. Standard size is 30cm x 30cm (12 inch x 12 inch), and sheets with the following color plays are currently held as standard stock items:

**R20C5W
R25C5W
R29C4W
R30C5W**

**R35C5W
R40C5W
R35C1W**

Other color plays and sizes are available. Prices depend on size, quantity and color change properties. Please ask for details.

CUSTOM MANUFACTURE

In addition to the standard range of polyester sheets, **LCR** also offers a custom-manufacturing service, tailor-making temperature-sensitive sheets and films to customer requirements. A wide range of substrates can be used, both rigid and flexible, with various thickness, Specific problems, like UV stability and water-resistance, for example, can be addressed. All the unsealed TLC mixtures can be microencapsulated and made into sheets or films. These include single color change formulations giving, for example, sheets and films which change from green (below) to black (above) at given temperatures (-20°C (-4°F) to 100°C (212°F). Many possibilities exist; please do not hesitate to contact us.

Using LCR Liquid Crystal Coated Temperature Sheets

GENERAL INFORMATION AND NOTES

1. Coated sheets are the most stable form in which LC's is readily available.
2. LC sheets are constructed from either clear polyester (Mylar) or polycarbonate (Lexan) over laminate. The color change properties of the LC coating are viewed through the clear over laminate.
3. The sheets are supplied backed with pressure-sensitive adhesive and, on removal of the protective backing, can be adhered to a variety of flat surfaces.
4. as with all LC applications, the better the incident lighting, the brighter the colors reflected by the LC. However, the use of incandescent lamps too close to the LC Sheets should be avoided, as the materials are sensitive to UV light and the color play properties will change on prolonged exposure.
5. The colors observed depend not only on temperature, but also on the angle of observation (and illumination). In practice, LC sheets should be viewed from a direction normal to their surface.
6. LC Sheets should retain color play characteristics for many months under normal handling conditions. Continued submersion and temperature cycling in hot (40+°C (105+°F)) water baths will accelerate degradation, as will continued temperature cycling at elevated temperatures in general.

USAGE INSTRUCTIONS

Using the products as a freestanding film in air and fluid flows is straightforward; all that is necessary is adequate support. For adhering the sheets to flat surfaces, the following simple steps should be followed:

1. Clean surface thoroughly to remove all dirt, grease, etc. Chloroform, petroleum ether and similar organic solvents may be used. Ensure that the surface is *completely* dry before proceeding.
2. Remove protective backing from adhesive and place sheet lightly in position on surface. Press down firmly with fingers in center of sheet and smooth outward, in each direction in turn, to ensure that no air bubbles are trapped between the sheet and the surface.

Cleaning Up

Sheets can be cleaned using a soft cloth and warm soapy water. Do not use abrasive material or aggressive solvents.

Storage

Unused sheets should be stored out of direct sunlight at room temperature (20-25°C (68-77°F)), and preferably in a solvent-free environment. Sheets in position on test surfaces should be protected from UV light and organic solvents wherever possible. The color play properties of the sheets should be checked out at regular intervals to ensure that they have not changed. If the sheets are stored correctly, a lifetime of one year can be expected.