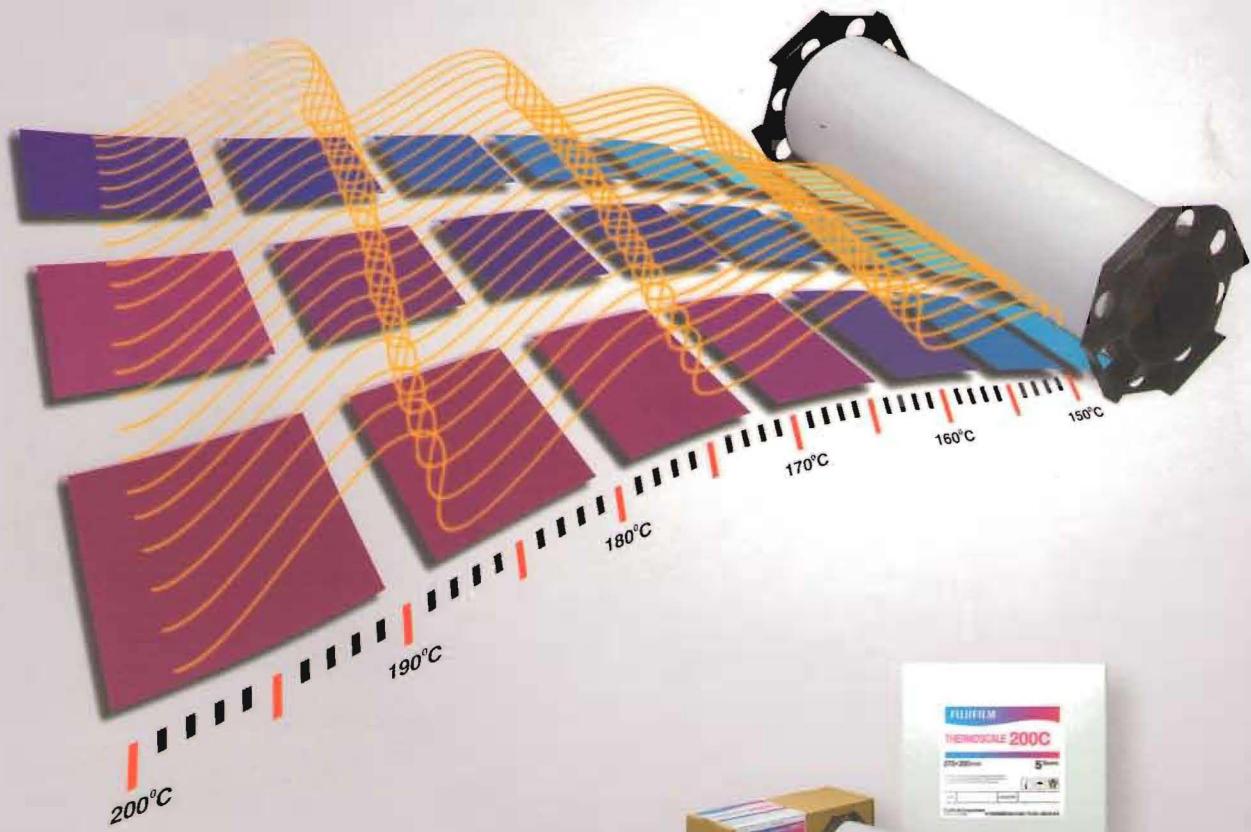


Heat Distribution Measurement Film



THERMOSCALE is a revolutionary new film that enables anyone to measure heat distribution easily by observing the variation in density and hue.

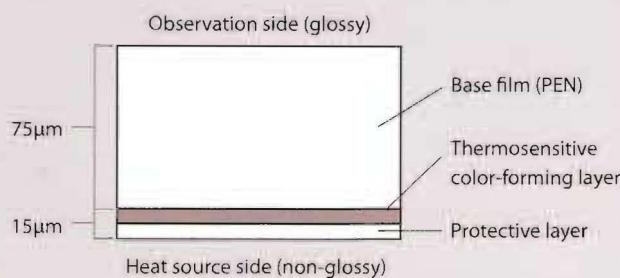


■ Measures a wide range of temperatures (150°C-200°C) to suit a variety of different applications.

■ Simply cut to size and insert as required.

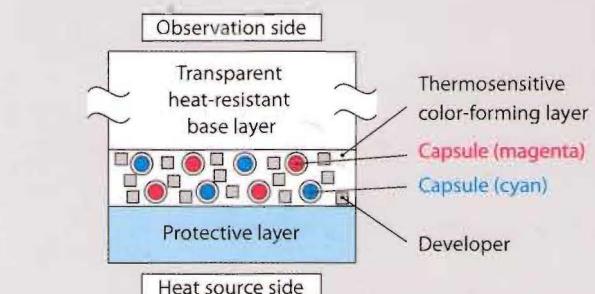
Structure

The base film is coated with a thermosensitive color-forming layer and a protective layer. This is the non-glossy surface that comes into direct contact with the heat source. The glossy side of the sheet is used to observe the color patterns that represent heat distribution.

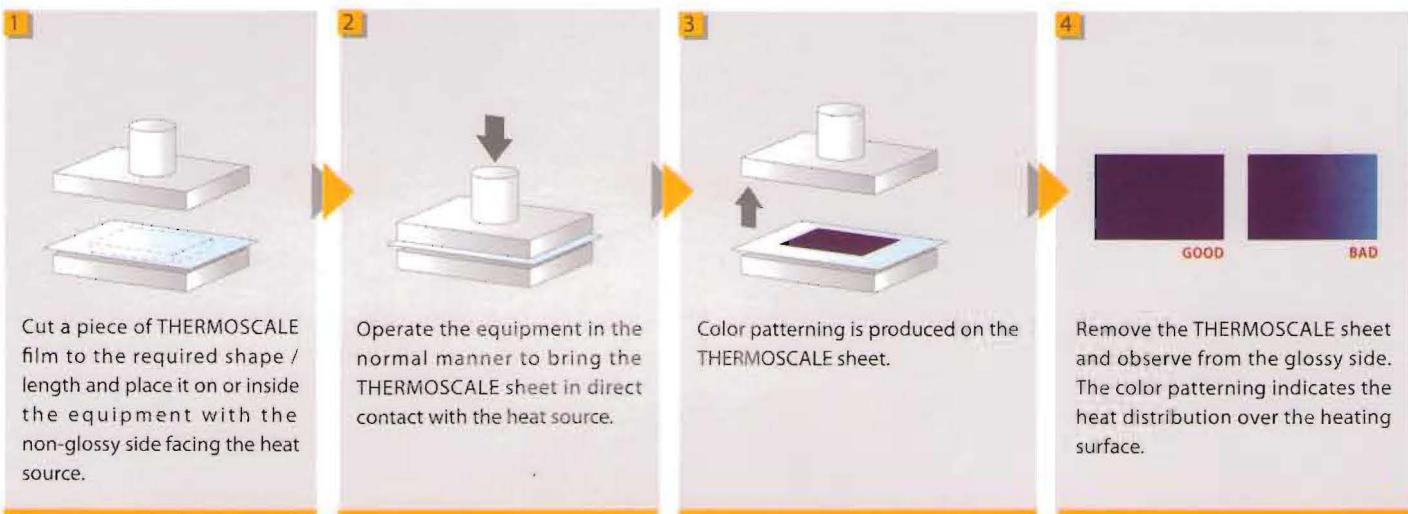


How it works

Heat melts the developer and makes the microcapsule walls permeable, allowing developer to enter the microcapsules, where it reacts with the color-forming agent to produce color.

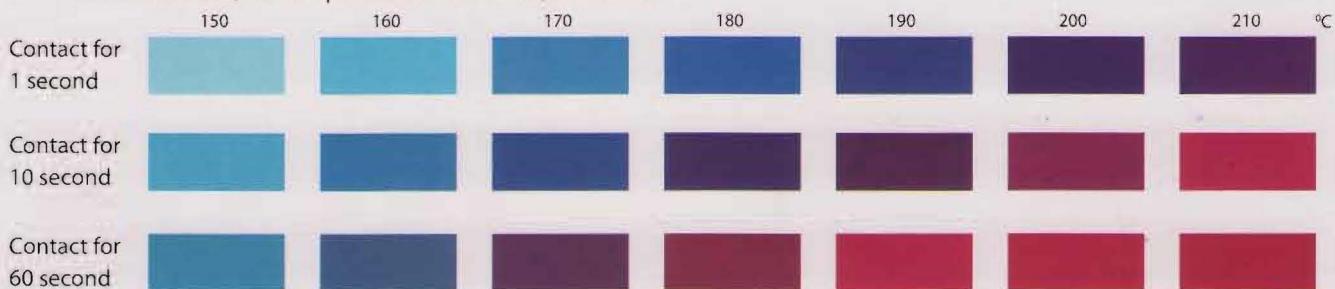


How to use THERMOSCALE



Features

The extent of color change depends on the temperature of the heat source and the contact time. A shorter contact time produces paler colors with a blue tint. As the contact time increases (at the same temperature), the colors become deeper and take on a red tint. Note that the color change is also influenced by factors such as the type of material on the opposite side (i.e., the non heat source side), thermal characteristics, contact pressure and air flow (see below).



*Note: The above sample colors were produced by Fujifilm under test conditions. Calibration should be performed under actual usage conditions to ensure temperature correspondence.

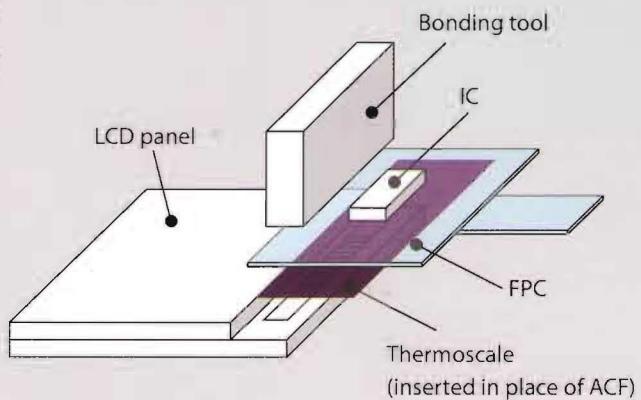
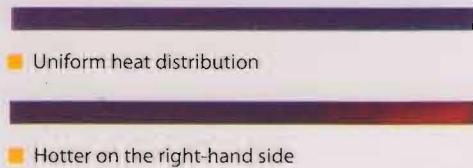
Recommended temperature range: 15°C-30°C Recommended humidity: 35% RH-80% RH

Typical applications of THERMOSCALE

1 ACF compression bonding in LCD panels

In LCD panel production, ACF (anisotropic conductive film) is used to attach the driver IC by holding the part under pressure and applying heat via the bonding tool. If heat is unevenly distributed across the bonding surface (i.e., hotter in some places and cooler in others), the ACF may not bond properly.

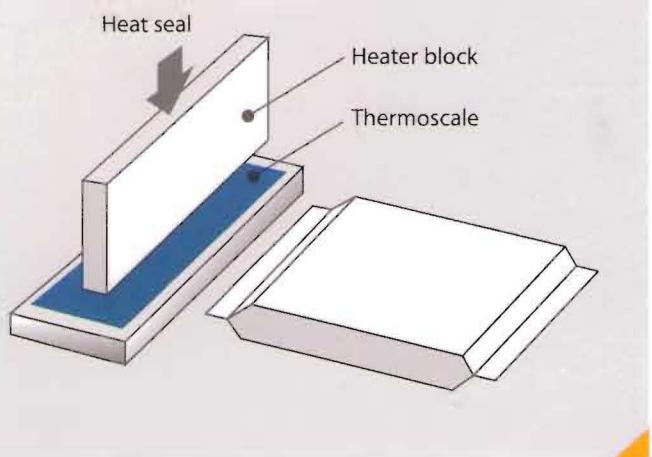
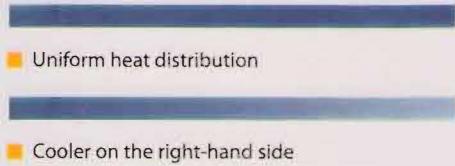
THERMOSCALE provides an easy-to-read visual map for evaluating the uniformity of heat distribution.



2 Heat-sealed packages

Heat sealers are commonly used to seal packages for foodstuffs, medical supplies and products such as Li-ion batteries. A heater block applies strong heat to the end of the package to seal the plastic. If heat is distributed unevenly across the heat seal surface or the heater block, or if the packaging is not heated sufficiently, the seal may not be formed properly.

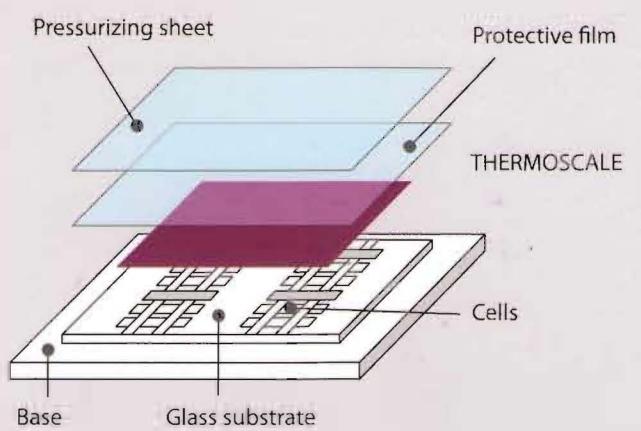
THERMOSCALE can be used to evaluate the quantity of heat applied to the package.



3 EVA bonding of solar panels

In solar panel production, the solar cells are sandwiched between the glass substrate and a protective film layer and bonded together with EVA resin in a vacuum laminator. If the heat distribution is not uniform, the EVA resin may be harder in some places and softer in others, affecting bonding performance. In some cases, the bond may hold initially but then degrade over time. Until now there has been no means of measuring heat distribution across the bonding surface.

THERMOSCALE provides a simple way to check for thermal inconsistencies and prevents failure.

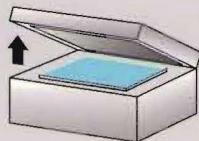


Uses

THERMOSCALE uses special technology that regulates color intensity and hue in accordance with heat value to generate a highly accurate depiction of heat values over a wide range.

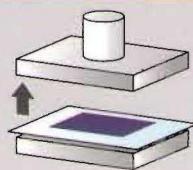
THERMOSCALE is ideal for applications involving analysis of heat distribution during press, roll, and laminate processes and within drying ovens.

Laminator



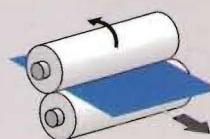
Printed substrates, solar panels, protective film laminating

Press



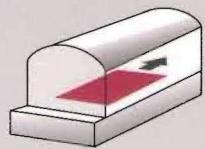
ACF compression bonding, heat seals, Li-ion batteries, solar panels

Roll



Nip roll, calendar roll, printing roll, printer roll

Ovens



Drying oven, baking oven, vacuum film production, measuring surface heat distribution on parts

Specifications

Product	Temperature range	Base layer	Thickness	Size	
				Roll Type (width x length)	Sheet Type (height x width)
THERMOSCALE 200C	150°C-210°C *1	PEN	0.09 mm	270 mm x 5 m	270 mm x 200 mm x five sheets

* Actual temperature range depends on conditions of use including contact time, materials, pressure, and air flow. *1 Contact time = 5-20 sec

THERMOSCALE 200C

Roll Type



Sheet Type



PRESCALE

Another revolutionary film to measure pressure and pressure distribution.

<http://www.fujifilm.com/products/prescale/>