



Thermal Test Film

Instruction Sheet • Version B • Version 1.1

Azenta's Thermal Test Film (TTF) can be used in conjunction with a roll fed (e.g. Automated Roll Heat Sealer) or sheet fed (e.g. Semi-Automated Sheet Heat Sealer) to check the uniformity and reproducibility of the heat sealing block of the instrument. The film can be used to effectively test the temperature of the heating block between 160 °C – 200 °C.

Principle

The Thermal Test Film has a thermosensitive colour-forming layer plus a protective layer, both attached to the base material. Depending on the temperature applied to the film, a colour is produced in varying density and hue – giving a perfect image of heat distribution across the heating block of your heat sealer.

The colour varies according to dwell time and temperature. The shorter the duration, the paler and more blueish the colour. The longer the duration, the more saturated and reddish the colour. Please refer to the colour chart below.

| Temperature/ Duration | 150 °C | 160 °C | 170 °C | 180 °C | 190 °C | 200 °C | 210 °C |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|
| 1 Second | | | | | | | |
| 2 Seconds | | | | | | | |
| 3 Seconds | | | | | | | |

Note: This colour chart is just an example based on the results of the tests performed in our laboratories. Before using the Thermal Test Film, please create a similar chart that is based on your actual measurement conditions.

Technical Specifications

| Technical Specifications | |
|---------------------------------|-----------------|
| Sealing Temperature Range | 160 °C – 200 °C |
| Recommended Ambient Temperature | 15 °C ~ 30 °C |
| Recommended Ambient Humidity | 35%RH ~ 80%RH |

Ordering Information

| Code | Description | Quantity |
|----------|--|-----------|
| 4ti-0640 | Thermal Test Film, sheets (125mm x 80mm) | 25 sheets |
| 4ti-0641 | Thermal Test Film, Starter Kit, 10 sheets (125mm x 80mm), 1 silicone pad | 1 kit |
| 4ti-0642 | Thermal Test Film, Roll Kit, 1 roll (1M x 80mm), 1 silicone pad | 1 kit |



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Thermal Test Film Procedure using a Roll Fed Heat Sealer

Exemplarily for Automated Roll Heat Sealer (4ti-0665)

1. Start to load the TTF material as you would a conventional heat seal roll. Take care that the outside surface of the roll is orientated in the right direction that it becomes the top surface of the seal during the film loading process.
Note: The Thermal Test Film is flanked with a 0.3M length of clear film at either end to eliminate any waste of the TTF in setting up the testing process.
2. Using the Seal Loading Tool, pull the film through the instrument until the end that you hold protrudes approximately half a plate's length beyond the edge of the door (which should still be half open).
3. Complete the onscreen commands to finish the loading process. You should now end up with the clear material tail and a small amount of the TTF material (which is white) coming away freely in your hand.
4. Set the temperature on the instrument display to the lowest temperature you want to test.
5. Set the sealing dwell time to 10 seconds.
6. Place the plate adaptor A in its usual position and place the silicone pad on the adaptor (WHITE SIDE FACING UP), as though it were a plate to be sealed.
7. Start the sealing process in the usual way and once complete, remove the TTF image.
8. Raise the temperature of the heating block to the next test temperature. Once this is reached, repeat Step 7 to produce your next test result.
Note: There should be enough TTF material to provide 8 test results.
9. Once the testing has been completed, remove the final tail of clear material as per the roll changing instructions in the instrument's User Manual.
10. Inspect the colour intensity and uniformity on the glossy side of the film. A temperature variation across the sealing block as small as 2 °C will give a colour variation that you can visually distinguish. You can also compare your results against the chart on this document, please see reverse.
11. Store your TTF result sheets away from any light, preferably in a blacked out envelope.

Thermal Test Film Procedure using a Sheet Fed Heat Sealer

Exemplarily for Semi-Automated Sheet Heat Sealer (59-2000)

1. Set the temperature on the instrument display to the lowest temperature you want to test.
2. Set the sealing dwell time to 10 seconds.
3. Place the standard plate adaptor (59-2001) in its usual position and place the silicone pad on the adaptor (WHITE SIDE FACING UP), as though it were a plate to be sealed.
4. Place the TTF sheet on top of the mat with the non-glossy side up.
5. Start the sealing process in the usual way and once complete, remove the TTF image.
6. Raise the temperature of the heating block to the next test temperature. Once this is reached, repeat Steps 4 and 5 to produce your next test result.
7. Once the testing has been completed, inspect the colour intensity and uniformity on the glossy side of the film. A temperature variation across the sealing block as small as 2 °C will give a colour variation that you can visually distinguish. You can also compare your results against the chart on this document, please see reverse.
8. Store your TTF result sheets away from any light, preferably in a blacked out envelope.

Precautions for Use

1. For single use only.
2. Colours may vary depending on various conditions, such as ambient temperature, humidity, air currents and contact pressure.
3. Moisture, oil, dust or fingerprints may leave marks, causing colour unevenness.
4. Use the Thermal Test Film before the expiration date indicated on the label attached to the box.

Precautions for Storage

1. Keep any unused film in its original bag, away from direct sunlight. Store in a dark, cool ($\leq 23^{\circ}\text{C}$) area.
2. Keep used film in a commercially available file, away from direct sunlight and flame. For long-term storage, place it in a dark, cool ($\leq 23^{\circ}\text{C}$) area. Make sure to keep the film away from chemicals and solutions which may cause problems on the glossy observation side, such as discoloration.

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