



Standard Test Method for Determining Static Thermal Sensitivity of Direct Thermal Media¹

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1. Scope

1.1 This test method covers the static thermal response of direct thermal media (paper, film, and paper/film laminates) to determine temperatures required for activation, functional and saturated densities. Static thermal response is a key test for determining heat stability characteristics of direct thermal media.

1.2 The instrument described in this test method may be used to develop product specifications, specification acceptance, product development, or research applications.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are for information only.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

F 1623 Terminology Relating to Thermal Imaging Products²

2.2 ANSI Standard:

IT 2.17-1995 Density Measurements – Geometric Conditions for Reflection Density³

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *functional temperature*—temperature which generates an optical density of 1.00.

3.1.2 *static thermal response*—the generation of the thermal response of a thermal media within a given printing system over a specific range of temperature levels.

4. Summary of Test Method

4.1 This test method is intended to determine the static thermal response of direct thermal media. The temperature versus density curve obtained is a characterization of a given coating and media substrate. Curves can be used to determine uniformity within and between direct thermal media lots. The test equipment and test procedures are not intended to simulate thermal response under actual end-use conditions in a direct thermal printer. Although no specific manufacturers have been identified for this equipment, any temperature controller, temperature sensor, and test fixture with equivalent signal output capabilities would be suitable.

4.2 To determine the static thermal response of direct thermal media, a sample is inserted into the test fixture with the coated surface up towards the heated platens. When fully inserted, a switch is tripped clamping the test media in contact with the heated platens under a given pressure for a prescribed length of time set with a timing mechanism.

4.3 The temperature controllers allow the heated platens to be adjusted to specific surface temperatures.

4.4 The thermal response or density saturation curve can be obtained by exposing samples from given direct thermal media to various temperatures for a specified time period.

5. Significance and Use

5.1 This test method enables static thermal response comparisons between direct thermal media and facilitates process control.

5.2 Comparisons can be made between and within thermal media production lots from the same manufacturer.

5.3 Comparisons can be made between thermal media product grades from different manufacturers.

5.4 This test method is useful in predicting heat stability for end-use applications.

6. Interferences

6.1 Wide variations in environmental conditions (especially relative humidity) will affect the resulting image density with this test method.

6.2 The length of elapsed time between sample exposure to

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² *Annual Book of ASTM Standards*, Vol 15.09.

³ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.