Designation: F 1405 – 98 (Reapproved 2002)

Standard Test Method for Determining the Dynamic Thermal Response of Direct Thermal Imaging Products—Atlantek Method[1]

This standard is issued under the fixed designation F 1405; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the measurement of thermal response of various direct thermal imaging papers or other thermal-coated substrates used for facsimile, labels, medical recorders, plotters, and printers.

1.2 The Atlantek Thermal Response Tester Model 200 described in this test method may be used for specification acceptance, product development, and research applications.

1.3 *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.* For specific precautionary statements, see Section 8.

2. Referenced Documents

2.1 *ASTM Standards:*

D 685 Practice for Conditioning Paper and Paper Products for Testing[2]

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method[3]

F 1623 Terminology Relating to Thermal Imaging Products[2]

2.2 *ANSI Standards:*[4]

PH 2.17 Density Measurements—Geometric Conditions for Reflection Density

PH 2.18 Density Measurements—Spectral Conditions

2.3 *Operators Manual:*

Atlantek Operators Manual for Model 200 Thermal Response Test System[5]

3. Terminology

3.1 *Symbols:*

3.1.1 T_{cycle}—the time between printed lines. The larger the T_{cycle} value, the more time between printed lines. The result is slower print speeds. Smaller T_{cycle} values correspond to faster print speeds. Time between printed lines equals dot "on" time plus dot "off" time ($T_{cycle} = T_{on} + T_{off}$).

3.1.2 T_{on}—the amount of time that the heating elements (dots) on the printhead are energized. Typically, this value is in milliseconds. T_{on} is also called strobe time.

4. Summary of Test Method

4.1 This test method involves imaging direct thermal product using an Atlantek Model 200 Thermal Response Test System. The system is designed to provide thermal response measurements using printheads commonly used in facsimile units, label printers, medical recorders, plotters, and other printers. This system is based on a special purpose controller board which drives a standard thermal printhead and a programmable stepping drive controller. This system includes provisions for mounting standard performance printheads. A personal computer controls the system with parameter programming accomplished from menu-driven software designed specifically for thermal response and performance characterizations.

4.2 To determine thermal response, thermal product in roll or sheet form is fed into the printer. From the Main Menu, the test system is configured to the Test Mode. Again from the Main Menu, Execute a Test is chosen. A standard existing test file can then be loaded and the New Test can be given a file name or default standard test conditions can be used. The test thermal product (media) is identified, printhead voltage set, and the test executed. Densitometer measurements can then be entered into the test file (manually or automatically). Data in the test file created can then be used to graphically display the thermal response of the test thermal product.

5. Significance and Use

5.1 The Atlantek test system allows simulation of direct thermal printers in the marketplace. Thus, this system is useful in matching direct thermal product performance to various printer configurations.

5.2 This test system is useful for new product development. Direct thermal printer manufacturers can design print control algorithms to match particular thermal imaging products.

[1] This test method is under the jurisdiction of ASTM Committee F05 on Business Imaging Products and is the direct responsibility of Subcommittee F05.06 on Carbonless and Thermal Imaging Products.

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

[3] *Annual Book of ASTM Standards,* Vol 14.02.

[4] Available from American National Standards Institute, 11 West 42nd St. 13th Floor, New York, NY 10036.

[5] Available from Atlantek Corp., 10 High St., Wakefield, RI 02879.

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