



Designation: F 1051 – 00

Standard Test Method for Comparing Multistrike Film Ribbons¹

This standard is issued under the fixed designation F 1051; 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 information and techniques for evaluating several performance qualities of multistrike film typewriter/prINTER ribbons on a comparative basis for general office use. It is not intended for specialized applications such as optical character recognition.

1.2 *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.* See Note 10 for a specific cautionary statement.

2. Referenced Documents

2.1 ASTM Standards:

- D 1776 Practice for Conditioning Textiles for Testing²
- D 3460 Specification for White Watermarked and Unwatermarked Bond, Mimeograph, Duplicator, and Xerographic Cut-Sized Office Papers³
- F 221 Terminology Relating to Carbon Paper and Inked Ribbon Products and Images Made Therefrom³
- F 425 Terminology Relating to Lithographic Copy Products³
- F 497 Practice for Use of the Electric and Electronic Typewriter as a Test Instrument³

2.2 ANSI Standards:

- PH2.17 Density Measurements—Geometric Conditions for Reflection Density⁴
- PH2.18 Density Measurements—Spectral Conditions⁴

3. Terminology

3.1 For definitions of terms used in this test method, see Terminology F 221 and F 425.

4. Summary of Test Method

4.1 This test method consists of testing multistrike film ribbons under actual and simulated use conditions, employing printers, automatic typewriters, or typewriters equipped with a robot device and several simulation techniques generally accepted in the inked ribbon industry. All sample ribbons are conditioned and tested under identical conditions, so as to obtain comparative results.

5. Significance and Use

5.1 This test method should be used to evaluate several performance qualities of multistrike film ribbons on a comparative basis.

5.2 This test method is suitable for comparative service evaluation, research, and development. It may also be used for manufacturing control but only on a limited basis, due to time span required for some of the procedures.

5.3 This procedure consists of several tests that are used to evaluate different characteristics of multistrike ribbons. The user can choose any one of these, a series of tests, or all tests depending on his needs and interests.

6. Apparatus and Materials

6.1 *Electronic Typewriter or Printer*, which has been conditioned and calibrated in accordance with Practice F 497, Sections 10 and 11.

6.2 *Reflectometer*, meeting the geometric conditions of PH2.17 and the spectral conditions of PH2.18.

6.3 *Microdensitometer*, equipped with a 0.008-in. aperture and grid pattern.⁵

6.4 *Environmental Chamber*, capable of maintaining $120 \pm 2.0^\circ\text{F}$ ($49 \pm 1^\circ\text{C}$) for 48 h at a relative humidity of $50 \pm 2\%$.

6.5 *Paper*, in accordance with Specification D 3460, Type I, Grade 4.

6.6 *Magnifier*—20× with measuring graduations.

6.7 *Control Multistrike Ribbon*, of known quality and performance characteristics.

6.8 *Type font*, which produces a printed image with a stroke width that exceeds 0.008 in.

¹ This test method is under the jurisdiction of ASTM Committee F-5 on Business Copy Products and is the direct responsibility of Subcommittee F05.02 on Inked Ribbons and Carbon Paper.

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² *Annual Book of ASTM Standards*, Vols 07.01 and 07.02.

³ *Annual Book of ASTM Standards*, Vol 15.09.

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

⁵ A McBeth PCM-II, Moore 082A Optical Character Tester or equivalent has been found satisfactory.

6.9 *Ink Rub Tester*,⁶ with

6.9.1 *Polishing Cloth*.⁷

7. Test Specimen

7.1 The test specimen should be a ribbon or portion of a ribbon, or both, which has not been used or handled. It is recommended that at least three wraps of ribbon be removed or advanced to ensure that the test specimen is free of environmental contamination.

NOTE 1—If all procedures in Section 10 are to be performed, prepare all test specimens at the same time.

8. Identification

8.1 For identification of test specimens, the following is recommended:

- 8.1.1 Ribbon (name),
- 8.1.2 Manufacturer's name and address,
- 8.1.3 Base material (substance and thickness),
- 8.1.4 Color (shade etc.),
- 8.1.5 Nominal length, width, and thickness,
- 8.1.6 Core inside and outside diameter,
- 8.1.7 Ribbon diameter,
- 8.1.8 Leader material, seal, and length,
- 8.1.9 End of ribbon nature, seal, and length,
- 8.1.10 Trailer material, seal, and length, and
- 8.1.11 Package description (configuration, box, etc.).

9. Conditioning

9.1 Condition the test specimen and test paper in accordance with Practice D 1776.

10. Procedure

10.1 *Write*—This procedure is for the evaluation of the ribbon when used with an overstrike mode of operation. This is the normal or intended use for the ribbon.

10.1.1 Install the ribbon in a clean multistrike cartridge which is compatible with the typewriter or printer to be used for the test.

10.1.2 Type five lines of ten capital *H*'s. (See Fig. 1.) Measure the visual reflection of the seventh *H* using a microdensitometer with a 0.008-in. aperture using the following procedure.

10.1.3 Measure the reflection of the left leg at the top, center, and bottom of the *H*. Average the three readings for each line. Repeat this procedure for each of the five lines and average the five readings calling the value D_1 .

NOTE 2—Do not include any area containing a void in the character.

10.1.4 Repeat measurement of the right leg of the *H* and average the readings as described in 10.1.3. The resulting average is called D_2 .

10.1.5 *Calculation*:

$$\text{Write variation, \%} = \frac{D_2 - D_1 \times 100}{D_1} \quad (1)$$

10.1.6 Rank samples based on write variation number.

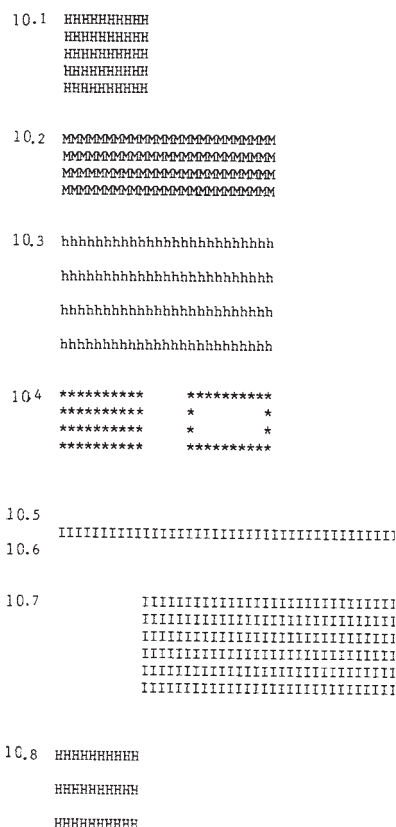


FIG. 1 Sample Test Pattern for Multistrike Film Ribbon Testing

NOTE 3—Lower is better.

10.2 *Void Test*:

10.2.1 Type 4 rows of 25 capital *M*'s on the sample sheet. Using the magnification of the microdensitometer or a separate magnification device, count the number of characters which have voids or breaks that are 0.004 by 0.004-in. or greater. Count only one void per character. Report the number of voids.

10.2.2 Rank the samples by the number of voids.

NOTE 4—Lower is better.

10.3 *Extraneous Ink and Spatter*:

10.3.1 Type 4 rows of 25 lower case *h*'s double-spaced at maximum impression setting. Use a magnification device to view and count the number of spots 0.004 by 0.004-in. or greater within the character field. Character field is defined by the rectangle described by the outermost part of the printed characters. Count the number of characters which have spatter, not the number of spots.

10.3.2 Rank the samples by the number of spots counted.

NOTE 5—Lower is better.

10.4 *Cover-up Correction Reflectance*:

10.4.1 Type four rows of ten asterisks (*) single-spaced, at nominal impact pressure. Then with the intended cover-up tape, cover up the inner asterisks of the block that was just typed.

10.4.2 Using the microdensitometer measure the centers of each of the covered-up asterisks and compute an average reflectance.

⁶ Sutherland or equivalent has been found satisfactory.

⁷ Buehler Cloth No. 4C-7228 or equivalent has been found satisfactory.