Designation: F 396 – 00 (Reapproved 2004)

Standard Practice for Comparing One-Time Noncorrectable Typewriter Ribbons[1]

This standard is issued under the fixed designation F 396; 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 practice provides information and techniques for evaluating several performance qualities of one-time noncorrectable typewriter ribbons on a comparative basis for general office use, but not for specialized applications such as optical character recognition (OCR), data terminals, etc.

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 whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:* [2]

D 1776 Practice for Conditioning and Testing Textiles

F 550 Test Method for Lithographic Properties of Imaging Materials[3]

F 627 Practice for Testing Flake of Single-Strike Film Typewriter Ribbons

2.2 *ANSI Standards:*

PH2.17 Density Measurements—Geometric Conditions for Reflection Density[4]

PH2.18 Density Measurements—Spectral Conditions[4]

3. Summary of Practice

3.1 This practice essentially consists of testing one-time noncorrectable ribbons under actual- and simulated-use type conditions, employing an automatic or robot typewriter, and several use-simulating techniques generally accepted in this industry. All tests must be run in duplicate under the same conditions so that comparative results are obtained.

4. Significance and Use

4.1 This practice can be used to evaluate various properties of one-time noncorrectable ribbons on a comparative basis. These properties include write, flake-off, heat stability, bleed-through, offset master erasability, reproduction, unintentional transfer, and general quality, that is, splices, skips, and holes in coating, offset to back of ribbon, and transfer to fingers.

4.2 This practice is suitable for comparative service evaluation and research and development. This practice may not be practical for manufacturing control because of time required to run some of the tests.

5. Apparatus and Materials

5.1 *Electric Typewriter*, which can be used in conjunction with a robot device (or can be programmed) that has been adjusted in accordance with the instructions supplied by the manufacturer.

5.2 *Reflection Densitometer*, meeting the geometric conditions of PH2.17 and the spectral conditions of PH2.18.

5.3 *Oven*, capable of maintaining 120 ± 2°F (49 ± 1°C) at 40 % relative humidity for 48 h.

5.4 *Magnifier*, 4×.

5.5 *Paper*, of the type to be used when ribbon is "in use."

5.6 *Reflectance Meter*, equipped with a 0.008-in. (0.2-mm) aperature.

5.7 *Sutherland Ink Rub Tester.*

5.8 *Polyethylene Foam*, 1/8-in. (3-mm) thick.

5.9 *Buehler Polishing Cloth*, No. 4C-7228 or equivalent.

6. Test Specimen

6.1 The test specimens shall be a portion of each of the ribbons not previously used or handled.

7. Conditioning

7.1 Condition in accordance with Practice D 1776.

8. Test Methods

8.1 *Write*:

8.1.1 Use the robot device to prepare a standardized number of lines of typing.

[1] This practice is under the jurisdiction of ASTM Committee F05 on Business Copy Products and is the direct responsibility of Subcommittee F05.02 on Carbon Paper and Inked Ribbons.

Current edition approved Dec. 1, 2004. Published December 2004. Originally approved in 1974. Last previous edition approved in 2000 as F 396 – 00.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Withdrawn.

[4] Available from American National Standards Institute, 25 W. 43rd St., 4th Floor, New York, NY 10036.

8.1.2 Measure the reflection density of each image in accordance with PH2.17 and PH2.18 or make a visual comparison.

8.1.3 Examine writes under a 4× magnifier and compare them for sharpness, uniformity, and voids.

8.2 *Flake-off*:

8.2.1 Test in accordance with Practice F 627.

8.3 *Oven Test (Effects of High Temperature)*:

8.3.1 Place a sample ribbon in an oven at 120 ± 2°F (49 ± 1°C) at 40 % relative humidity for 48 h.

8.3.2 After stabilization at 73 ± 2°F (23± 1°C) for 6 h, examine for loose cores, loose leaders, visible distortion, adhesion between layers, material transfer, and changes in write and flake-off in accordance with 8.1 and 8.2.

8.4 *Bleed-Through (Cover-up Fluid, Tape, or Tabs)*:

8.4.1 Treat separate standard write samples with cover-up fluid. Cover others with correction tape, and correct others using correction tabs.

8.4.2 Compare after 5 min and again after 24 h with other samples and untreated portions for bleeding and coverage.

8.5 *Offset Master Erasability Test*:

8.5.1 Refer to appropriate section of Test Method F 550 for proper procedure to determine erasability properties. Use the prepared masters in 8.6.

8.6 *Reproduction*:

8.6.1 After typing age each master for a minimum period of 1 h. Prepare the master and the offset press using the chemical system and technique recommended by the master manufacturer.

8.6.2 Run the number of copies specified by the manufacturer as the master's life. Remove the master and store for 24 h.

8.6.3 Compare copies from each ribbon for freedom from filling, and for cleanliness, sharpness, and legibility. Record the number of start-up sheets not acceptable for each ribbon.

8.6.4 Compare with erasability results of 8.5.

8.7 *Unintentional Transfer (Smudge)*:

8.7.1 Type six rows of *I*'s single spaced, with 30 characters in row at ten pitch.

8.7.2 Place the section of paper with the typed *I*'s facing up, onto the metal base plate of the Sutherland Ink Rub Tester. The section should be firmly held in place directly under the center swing of the weighted arm.

8.7.2.1 Tape two 1 by 2-in. pieces of 1/8-in. polyethylene foam to each end of the bottom of the 4-lb weight of the Rub Tester. Adhere two 1 by 2-in. pieces of Buehler Polishing Cloth, No. 4C-7228. Carefully place the weight onto the section of paper with the polishing cloth resting on the typed impressions. (Replace cloth when visual smudging occurs when using a clean piece of paper.)

8.7.2.2 Lock the weight into the radius arm, set the timer to run for ten cycles, run the tester, and remove the weight.

8.7.3 Measure the reflectance of the space between the first and second *I*'s on each of the second and third rows from the top left-hand and top right-hand corners. Position the detection head so that the aperture opening is between the *I*'s.

8.7.4 Average the four measurements.

8.7.5 Rank samples by the reflectance value of smudged area, where No. 1 = lowest average reading. Thus No. 1 would exhibit the greatest unintentional transfer.

8.8 *General Quality*:

8.8.1 Unwind each ribbon and examine for splices and skips, and the degree of ink offset to back of ribbon.

9. Identification

9.1 For identification of ribbons the following is suggested:

9.1.1 Ribbon (name),
9.1.2 Manufacturer,
9.1.3 Manufacturer's address,
9.1.4 Base material,
9.1.5 Color,
9.1.6 Length,
9.1.7 Width,
9.1.8 Thickness,
9.1.9 Core outside diameter,
9.1.10 Core inside diameter,
9.1.11 Roll outside diameter,
9.1.12 Leader material,
9.1.13 Leader seal,
9.1.14 Leader length,
9.1.15 End warning,
9.1.16 End length,
9.1.17 Trailer material,
9.1.18 Trailer length, and
9.1.19 Package description.

10. Precision and Bias

10.1 This practice will provide repeatable ranking order results or repeatable relationship to a control within a laboratory using the same typewriter and operator.

10.2 Rank order and comparative results may not necessarily be reproduced between laboratories because of differences in operators, typewriters, typewriter actions, and ambient conditions.

11. Keywords

11.1 noncorrectable typewriter ribbons; one-time ribbons; typewriter; typewriter ribbons