Designation: F 627 – 99 (Reapproved 2003)

Standard Practice for Testing Flake of Single-Strike Film Typewriter Ribbons[1]

This standard is issued under the fixed designation F 627; 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.

INTRODUCTION

Flake is a term used to describe solid ink that is removed from a film-base typewriter ribbon during use, other than that required for creation of any image. It can have the cumulative effects of clogging the type face and contaminating the typewriter. Three variables can affect the flaking tendency of a ribbon: *(1)* ink formulation and coated weight, *(2)* adhesion of the ink to the base film, and *(3)* design and adjustments of the typewriter and cartridge. Flaking can be caused by the following mechanical forces:

(1) Impact of the type face—If the ink coating is brittle, fidelity of the edges of letters will be diminished as a result of irregular fracture by the type striking the ribbon.

(2) Abrasive forces during transport of the ribbon—These can cause coating to be removed as a result of contact of the moving ribbon with parts of the typewriter.

1. Scope

1.1 This practice covers two tests comparing the amount of flake of film typewriter ribbons.

1.2 A short test is recommended for partially used ribbons where flake is suspected.

1.3 A long test is recommended for use with unused ribbons that can be tested in their entirety.

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:* [2]

D 3460 Specification for White Watermarked, Unwatermarked Bond, Mimeograph, Duplicator, Xerographic, and Laser Printer Cut-Sized Office Papers

F 221 Terminology Relating to Carbon Paper and Inked Ribbon Products and Images Made Therefrom

F 497 Practice for Use of the Electric and Electronic Typewriter as a Test Instrument

F 1125 Terminology of Image Quality in Impact Printing Systems

3. Terminology

3.1 *Definitions:* For definitions of terms relating to carbon paper and inked ribbon products refer to Terminology F 221.

4. Summary of Practice

4.1 Both short and long tests require normal use of the ribbon on the machine for which it was designed and comparison of the results with those from a similar control ribbon, run under the same conditions on the same typewriter.

5. Significance and Use

5.1 This practice may be used for service evaluation, development, research, and specification acceptance.

5.2 The tests will produce significant results only if the control is the same product as the ribbon being tested.

5.3 This practice does not establish a standard or impose limits, but provides a means of assigning causes and comparing results.

6. Interferences

6.1 Any differences in ribbon processing, ribbon storage conditions, ribbon winding, or copy paper may cause variation in the test results.

[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 July 10, 1999. Published September 1999. Originally published as F 627 – 79. Last previous edition F 627 – 94.

[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.

6.2 An equal amount of flake-off from darker writing ribbons, as compared to lighter writing ribbons, would appear darker. This should be considered when making comparisons.

6.3 The same typewriter must be used for both the test ribbon and the control, due to adjustment variations between machines. Identical impact settings, platen position, and ribbon tensions must be used for both the control and the test ribbons.

6.4 Cartridge ribbons should be examined to differentiate between any incidence of flaking that is inherent to the ribbon, as opposed to flaking that is induced by poor design or imperfections in the cartridge. A poorly designed or badly fabricated cartridge can cause flaking as a result of pressure of the ribbon against it during transport. This is particularly important with correctable ribbon where the adhesion of the ink to the base film is low.

7. Apparatus

7.1 *Typewriter*, on which the product being tested is normally used.

7.2 *Device*, for automated continuous operation.

8. Materials

8.1 *Bond paper*, Grade 4, Type I (Specification D 3460), 20 lb weight (17 × 22 in.; 50 sheets) (75 8/m^2).

9. Sampling

9.1 Standard production ribbons shall be identified by lot numbers and at least two from each identified lot shall be used.

10. Preparation of the Apparatus

10.1 Adjust the typewriter in accordance with Practice F 497 and the manufacturer's instructions. Optimize the impact pressure and maintain at the same setting throughout the tests.

10.2 Clean the typewriter prior to conducting the tests so as to remove all dust and flake from previous use.

11. Procedure

11.1 *Short Test*, for partially used ribbons where flake is suspected:

11.1.1 Clean the typewriter to remove all visible evidence of dust, dirt, or flake from feed rolls, ribbon guides, ribbon vibrator, aligning scale, platen, dust shield, carriage ways, and segments.

11.1.2 Attach strips of two-sided adhesive tape in the impact area of the typewriter in order to collect flake particles.

11.1.3 Install the ribbon to be tested and advance to the unused area.

11.1.4 Type 750 characters (approximately a one-page letter).

11.1.5 Remove the ribbon and paper from the machine.

11.1.6 Remove the two-sided adhesive tape, being careful not to disturb the flakes which have fallen onto it. It may be desirable to photograph the tape before it is removed. Save the tape as part of the report.

11.1.7 Repeat 11.1.1 through 11.1.6 with each sample and control ribbon, using the same type of paper for each test.

11.2 *Long Test*, for unused ribbons:

11.2.1 Clean the machine as in 11.1.1.

11.2.2 Attach strips of two-sided adhesive tape in the impact area of the typewriter in order to collect flake particles.

11.2.3 Install the ribbon to be tested and advance beyond the leader.

11.2.4 Type through the entire ribbon with the aid of an automatic device and program.

11.2.5 Remove the ribbon and the used paper.

11.2.6 Remove the two-sided adhesive tape, being careful not to disturb the flakes which have fallen onto it. It may be desirable to photograph the tape before it is removed. Save the tape as part of the report.

11.2.7 Repeat 11.2.1 through 11.2.6 with each sample and the control ribbon, using the same paper and the same program for each test.

12. Interpretation of Results

12.1 All visual examination should be done with the aid of magnification.

12.2 Examine the typed paper in the margin and between the typed lines for spots or dots of ink that are not attached to an image.

12.2.1 Rate this machine-function flake by size and count of spots in accordance with Terminology F 1125.

12.3 Examine the font line of images 1, 8, e, M, and % for sharpness (definition of font line edge), degree of feathering, fill of image line (absence of voids in the copy), and for evidence of bridging in closed-loop images.

12.3.1 Rate this ribbon-function flake on the 5-step scale: 5 = good, 3 = medium, and 1 = bad.

12.4 Examine the typewriter for evidence of flake on feed rolls, ribbon guides, aligning scale, carriage rails, and segments.

12.4.1 Rate this machine-function flake on the same scale. Where possible, record the evidence with a photograph.

12.5 Examine the cartridge inside and out for evidence of ink deposits.

12.5.1 Rate the amount of this machine-function flake on the same scale and record the evidence with a photograph.

12.5.2 Examine the flake-collecting strips of two-sided adhesive tape. Rate the amounts collected on the same scale as 12.3.1.

12.6 Carefully remove or unwind the last-used section of the ribbon, and 1 to 2 yd of the first-used section for any evidence of ink being removed from areas other than the printed characters. Pay particular attention to ribbon edges and spaces between tracks. Examine for uniformity of track, and for partial or complete overstrike. Examine for elongation of the base film.

12.7 Rate this machine-function flake for source, size, and shape of deinked areas.

12.7.1 Edge flake is usually related to the ribbon vibrator of the aligning scale.

12.7.2 Flake before impact is usually due to tension in the unwind.

12.7.3 Elongation (ribbon narrowing with long wrinkles) is caused by excessive rewind tension.

12.8 Retain the pieces of used ribbon and mount as exhibits.

13. Report

13.1 List the ranking of each sample and its control for each of 12.2.1 through 12.7.

13.2 Identify major areas of flake and their causes.

13.3 Report a ranking for each sample in relation to the control ribbon.

14. Precision and Bias

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

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

15. Keywords

15.1 film; flake; ribbon; typewriter