



Designation: F 1454 – 99

Standard Practice for Comparing Correctable Film Ribbons¹

This standard is issued under the fixed designation F 1454; 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 performance qualities of a correctable film ribbon. It can be used to evaluate typewriter ribbons for general office use.

1.2 The values stated in either SI or inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

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.*

2. Referenced Documents

2.1 ASTM Standards:

D 685 Practice for Conditioning Paper and Paper Products for Testing²

D 882 Test Methods for Tensile Properties of Thin Plastic Sheeting³

D 3460 Specification for White Watermarked, Unwatermarked Bond, Mimeograph, Duplicator, and Zeropographic Cut-Sized Office Papers²

F 497 Practice for Use of the Electric and Electronic Typewriter as a Test Instrument²

F 1050 Test Method for Determining Winding Torque and Tension of Typewriter Ribbons²

F 1125 Terminology of Image Quality in Impact Printing Systems²

F 1174 Practice for Using a Personal Computer as a Test Instrument²

F 1443 Practice for Using 0.008-in. (0.023-mm) Aperture Reflectometers as Test Instruments for Measuring Visual Image Quality of Business Copy Images²

3. Terminology

3.1 **Definitions**—For terms that are used in this practice, see Terminology F 1125.

¹ This practice is under the jurisdiction of ASTM Committee F-5 on Business Imaging 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*, Vol 15.09.

³ *Annual Book of ASTM Standards*, Vol 08.01.

4. Summary of Practice

4.1 This practice covers testing for physical properties of correctable film ribbons, performance testing of correctable film ribbons under actual and simulated conditions on typewriters, and using the results to determine a comparative rating. All sample ribbons and supplies should be conditioned and tested under identical conditions in order to obtain comparative results.

4.2 All sample ribbons may be tested and compared with known control ribbons, a previous set of data, or an established standard.

5. Significance and Use

5.1 This practice should be used to evaluate performance qualities of correctable film ribbons on a comparative basis under actual and simulated conditions.

5.2 This practice is suitable for comparative service evaluation, research, and development. It may also be used for manufacturing quality control.

5.3 Users may choose any one test, a series of tests, or all tests, depending on their needs and interests in determining the different characteristics of correctable film ribbons.

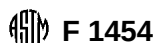
6. General Considerations

6.1 The following statements address some concerns about quality of the product. Although a complete list is not provided, the user must make the final determination of performance criteria factors and level at which each factor impacts the particular analysis.

6.2 **Visual Inspection**—Inspect the ribbon for a smooth, uniform coating (on the appropriate film base) free of folds, wrinkles, splices, blisters, uncoated areas, cracks, contamination, and other detrimental defects that would make the ribbon unfit for its intended purpose. Examine for a smoothly slit straight edge and proper winding without ragged and nicked edges.

6.3 **Ribbon Winding**—Examine and report telescoping or layer slippage that may have occurred in handling of the wound and assembled ribbon cartridges.

6.4 **Ribbon Cassette**—Design and performance of a ribbon cassette may be compared to a control product or other established standard. Inspect the cassette for dirt, oil, or any other type of debris that may cause functional or aesthetic problems.



7. Apparatus and Materials

7.1 *Electronic Typewriter or Printer*, capable of being set up in accordance with Practice F 497.

7.2 *Microdensitometer or Reflectance Meter*, equipped with a 0.008-in. (0.203-mm) aperture and grid pattern in accordance with Practice F 1443.

7.3 *Environmental Chamber*, capable of maintaining $120 \pm 2.0^\circ\text{F}$ ($49 \pm 0.16^\circ\text{C}$) for 48 h at a relative humidity of 50 $\pm$ 2 %.

7.4 *Type Font*, capable of producing a printed image with a stroke width exceeding 0.008 in. (0.203 mm).

7.5 *Paper*, which may be the grade normally used in the facility conducting the test or the grade conforming with Specification D 3460, Grade 1 or 4, Type I Bond, Basis 20 or 24 lb (9 or 11 kg).

8. Conditioning

8.1 The test specimen, equipment, and paper should be conditioned in accordance with Practice D 685.

9. Test Methods

9.1 *Weight*—From positions approximately 50 ft (15 m) apart on the ribbon spool, cut five $1 \text{ m} \pm 1\text{-mm}$ lengths. Determine weight of each to 0.001 g and report the average.

9.2 *Base Thickness*—Using the five samples from the ribbon weight test, remove the entire coating with a suitable solvent, air dry, and measure the thickness in two places for each sample. Report the average thickness to 0.0001 in. (0.0025 mm) or better.

9.3 *Tensile Properties*:

9.3.1 This test is in accordance with Test Methods D 882, using the following conditions:

9.3.1.1 *Sample Dimensions*—6.0 in. (152 mm) long.

9.3.1.2 *Cross Head Speed*—20.00 in. (508 mm)/min.

9.3.1.3 *Chart Speed*—5.00 in. (127 mm)/min.

9.3.1.4 *Jaw Separation*—2.00 in. (51 mm).

9.3.2 Report the following:

9.3.2.1 Ribbon/leader/trailer tensile strength at yield,

9.3.2.2 Ribbon/leader/trailer tensile strength at break, and

9.3.2.3 Ribbon/leader/trailer percent elongation at yield and break.

9.4 *Ribbon Dimensions*:

9.4.1 Measure the ribbon width, length, and pancake diameter by means of tape measure and calipers.

9.4.2 Measure the leader/trailer width and length by means of tape measure and calipers.

9.5 *Visual Reflectance of Image*:

9.5.1 *Apparatus*:

9.5.1.1 *Typewriter or Printer*, to be used as a test instrument set to manufacturer's specifications.

9.5.1.2 *Model 082 Clearwave Optical Character Tester*⁴ or equivalent equipment, set to visual reflectance.

9.5.1.3 *Type Font*, of style and size desired, set at medium impression.

9.5.1.4 *Typing Paper*, of the style and type desired.

9.5.1.5 *Test Conditions*—50 $\pm$ 2 % relative humidity and $73 \pm 2^\circ\text{F}$ ($23 \pm 0.16^\circ\text{C}$).

9.5.2 *Procedure*:

9.5.2.1 Turn on the Clearview Model 082 or equivalent instrument, and allow it to stabilize for at least $\frac{1}{2}$ h. Zero the machine in accordance with the manufacturer's instructions. Place calibration chip BaSO₄ over viewing aperture port and adjust calibration to 100 %.

9.5.2.2 Using the capital "I," type 50 characters in a row, randomly select five of the "I"s, and determine an average reading for each character by the following method. Measure reflectance along the center of the vertical portion of the "I" at four equidistant points. These points should include both top and bottom cross bars of the character and two equidistant points in between.

9.5.2.3 When measuring visual reflectance, ensure that the center circle of the instrument is centered in the vertical portion of the character. If the circle is misaligned, the measurement will be erroneous.

9.5.2.4 Record the data points and determine the averages.

9.6 *Edge Definition*:

9.6.1 *Apparatus*:

9.6.1.1 *Model 082 Clearview Optical Character Tester*, or equivalent equipment, set to visual reflectance.

9.6.1.2 *Test Conditions*—50 $\pm$ 2 % relative humidity and $73 \pm 2^\circ\text{F}$ ($23 \pm 0.16^\circ\text{C}$).

9.6.2 *Procedure*:

9.6.2.1 Using the 50 capital "I"s from the visual reflectance test, view them using Practice F 1443. Measure the peak-to-valley distance on the left-hand side of the character. Count one defect for each character having any peak-to-valley distance exceeding 0.004 in. (0.102 mm) in the vertical portion of the character.

9.6.2.2 Record the data.

9.7 *Line Spread*:

9.7.1 *Apparatus*:

9.7.1.1 *Model 082 Clearview Optical Character Tester*, or equivalent equipment, set to visual reflectance.

9.7.1.2 *Test Conditions*—50 $\pm$ 2 % relative humidity and $73 \pm 2^\circ\text{F}$ ($23 \pm 0.16^\circ\text{C}$).

9.7.2 *Procedure*—Using the capital "I"s from the visual reflectance test, determine the average print character width from the vertical portion of the character by using Practice F 1443. Measure five of the "I"s and compute the average print character width. Measure the actual character (font width) of the "I" from the type font. Compute and record line spread, as a function of average print character width minus actual character width, divided by actual character width, times 100 %.

$$(\text{average print character width}) - \quad (1)$$

$$\text{Line spread} = \frac{(\text{actual character width})}{\text{actual character width}} \times 100 \%$$

9.8 *Fill-Ins*:

9.8.1 *Apparatus*:

9.8.1.1 *Typewriter or Printer*, to be used as a test instrument set to manufacturer's specifications.

9.8.1.2 *Type Font*, of the style and size desired, set at medium impression.

⁴ Formerly manufactured by Moore, this tester is currently available from Clearwave, Inc., 8701 Buffalo Ave., Niagara Falls, NY 14304.