



# Standard Test Method for Measuring the Ribbon Exit Force for Film and Fabric Cartridges<sup>1</sup>

This standard is issued under the fixed designation F 1225; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method determines the exit force for typewriter and impact printer cartridges using film and fabric inked ribbons.

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.*

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

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

## 3. Terminology

3.1 Definitions of terms in this standard are in accordance with Terminology F 221.

## 4. Summary of Test Method

4.1 Fully assembled typewriter cartridges containing either film or fabric-inked ribbons are placed on a flat surface. The appropriate measuring gage is attached to the exit side of the cartridge ribbon and pulled at a constant rate taking 3 to 4 s to move 1 ft (10 to 13 s to move 1 m) until the gage scale reaches a consistent or repeated maximum reading.

## 5. Significance and Use

5.1 This test method can be used to evaluate the exit force for film or fabric typewriter ribbon and impact printer cartridges from one or more lots produced by one or several manufacturers. This test method may be applied to specification acceptance, manufacturing control, or research.

## 6. Interferences

6.1 Before testing, each cartridge should be thoroughly examined. A poorly designed or badly fabricated cartridge can cause dragging of the ribbon against it during transport.

## 7. Apparatus

7.1 *Force Gages*—Any suitable force gages which are scaled in the ranges from 0.1 to 1 oz (3 to 30 g) and 0.1 to 3 oz (3 to 90 g). Gages should be designed to work vertically or horizontally, depending on the application.

## 8. Fabric Cartridge Procedure

8.1 Position the scale on the force gage so as to be readable and on the zero point.

8.2 Pull out at least 1 ft (0.30 m) of ribbon from the exit side of the cartridge.

8.3 Clip the clamp of the force gage to the exit side of the cartridge ribbon.

8.4 Place the cartridge on a flat surface in a vertical manner and hold with one hand. If needed, the cartridge can be held by a vice or other holding device provided it does not compress the cartridge so as to alter the test result.

8.5 Hold the force gage with the other hand, the scale perpendicular (up and down) with the cartridge directly in line under it. See Fig. 1.

8.6 Holding the cartridge stationary, pull the force gage up at a rate taking 3 to 4 s to move 1 ft (10 to 13 s to move 1 m) and observe the point on the gage where a consistent or repeated maximum reading results. Be sure that the ribbon going into the opposite leg of the cartridge is slack. Refer to Note 1.

NOTE 1—Exit force measurements may vary widely as ribbon is exhausted or restuffed depending on the type of cartridge. For meaningful results, record force measurements according to the described procedure after advancing the ribbon 25, 50, 75, and 90 % of its total length. (This cannot be done for those ribbons in a continuous loop form.) Consistency of force measurement throughout is indicative of a well functioning mechanism.

8.7 Record the result from the force gage and include all pertinent data regarding the sample tested, that is, source, type of ribbon, and the like.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee F05 on Business Copy Products and is the direct responsibility of Subcommittee F05.02 on Inked Ribbons and Carbon Paper.

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

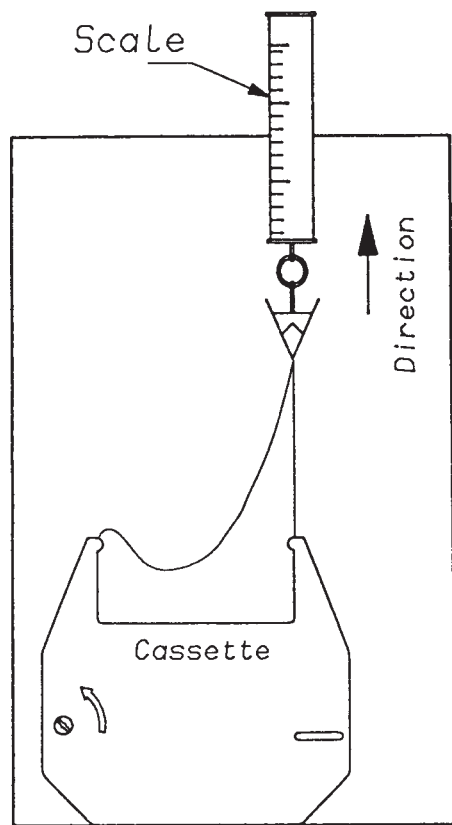


FIG. 1 Force Gage Position, Fabric Cartridge Procedure

8.8 Disconnect the clip from the ribbon. Apply alcohol to a rag and clean all stray marks from the gage.

**9. Film Cartridge Procedure**

9.1 Follow the same procedure as outlined in 8.1 through 8.3.

9.2 Place the cartridge on a flat surface (such as a table top edge) in a horizontal manner and hold with one hand.

9.2.1 For film type ribbons, it may be necessary to build a special fixture which simulates actual machine conditions in which the ribbon is to be used. This is because certain cartridge components may be installed to prevent ribbon unwinding during transport (shipment) and subsequently may become disengaged when installed into a typewriter while other tensioning devices are activated.

9.2.2 Because of design characteristics for movement of the film ribbon in a cartridge, all tests should be conducted with the cartridge in a flat (horizontal) position.

9.3 Hold the horizontal force gage parallel to the table and in line with the cartridge lying flat. If needed, the cartridge can be held by a vice or other holding device provided it does not compress the cartridge so as to alter the test result. See Fig. 2 and Fig. 3.

9.4 Holding the cartridge stationary, pull the force gage at a rate of 3 to 4 s to move 1 ft (10 to 13 s to move 1 m) and

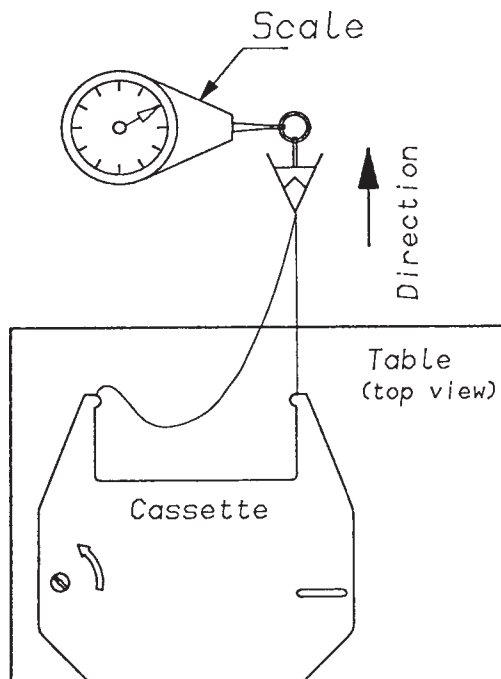


FIG. 2 Force Gage Position, Top View, Film Cartridge Procedure

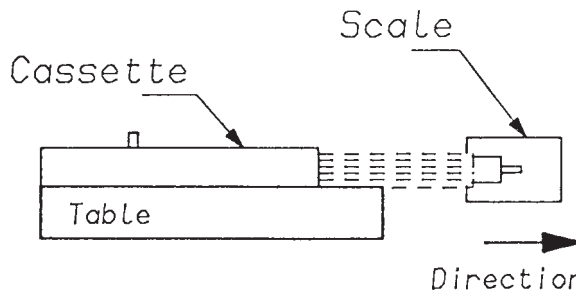


FIG. 3 Force Gage Position, Side View, Film Cartridge Procedure

observe the point on the gage where a consistent or repeated maximum reading results. Be sure that the ribbon going into the opposite leg of the cartridge is slack. Refer to Note 1.

9.5 Continue as outlined in 8.7 and 8.8 regarding data from the force gage and cleaning.

**10. Precision and Bias**

10.1 Precision is a function of the sensitivity of the force gage and the technique of the operator.

10.2 Because the test is a destructive type, repeatability on the same sample after the sample has been totally exhausted is not possible. Measurements within or between laboratories may not be reproducible because of differences in lot samples, operators, test equipment, and winding tension within the same sample.

**11. Keywords**

11.1 exit force; inked ribbons; typewriter ribbons

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