



Standard Test Method for Determining Winding Torque and Tension of Typewriter Ribbons¹

This standard is issued under the fixed designation F 1050; 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 (€) indicates an editorial change since the last revision or reapproval.

€¹ NOTE—Keywords were added in February 2000.

1. Scope

1.1 This test method covers the determination of film ribbon cartridge wind tension and torque. The instruments described in this procedure may be used for specification acceptance, manufacturing control, product development, or research applications, or combination thereof.

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. Summary of Test Method

2.1 This test method is intended to determine the dynamic cartridge tension and torque under controlled conditions. The test equipment and test procedures are intended to simulate cartridge tensions and torque under actual end-use conditions. Although specific manufacturers have been identified for this equipment, any torque and tension measurement equipment with equivalent signal output capabilities would be suitable.

2.2 To determine the mean cartridge tension and torque, a cartridge is put on a calibrated test fixture with the ribbon looped around the center wheel of a tension head and the ribbon being driven by a variable speed motor.

2.3 The tension head allows cartridge tension to be read in grams-force and torque in ounce-force inches.

3. Significance and Use

3.1 This test method enables tension and torque comparisons between cartridges and facilitates process control.

4. Interferences

4.1 Wide variations in environmental conditions (temperature and relative humidity) could affect the cartridge wind tension with this test procedure.

4.2 Tension range requirements vary with cartridge tension techniques. For example, ratchet and paw ranges from 10 to 60 g, foam from 60 to 150 g, and wrap spring from 30 to 80 g.

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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5. Apparatus and Materials

5.1 *Tension Heads*, 100 and 200-g.²

5.2 *Test Fixture Platform*, consisting of original equipment manufacturer ribbon deck, a freely turning wheel attached to the ribbon supply side of the platform, and variable speed drive motor.

5.3 *Calibration Weights*, of 20 g and 50 g.

5.4 *Digital Applicator*.²

5.5 *Recorder*.^{2,3}

5.6 *Speed Controller*.⁴

5.7 *Torque Measurement Drive Motor*.⁵

6. Test Specimen

6.1 The test specimen shall be an entire ribbon cartridge that has not been disrupted since it was assembled.

7. Identification

7.1 For the identification of ribbon cartridges, the following information is suggested:

7.1.1 Coated jumbo roll (batch) number,

7.1.2 Assembler's name or number,

7.1.3 Date and time of assembly.

8. Calibration

8.1 Calibrate the chart recorder and tension head at the start of each shift or more frequently depending upon the amount of drift encountered with the recorder.

8.2 Select and install the tension head with a range compatible with the ribbons to be tested. For example, ribbons with wrap spring or ratchet and paw tension systems may use a head with a range of 0 to 100 g. However, cartridges that use a foam pad tensioning system may require a head with 0 to 200-g range.

8.3 Once the recorder is turned on, it should be left on for the test period to minimize instrument drift.

² Test equipment components available from Tensitron Corp., Harvard, MA, have been found suitable for these purposes.

³ Tensitron G-C400 Recorder has been found suitable.

⁴ The Minarack SL-15-1 Speed Controller, available from Minarack Corp., Sunnyvale, CA, has been found suitable for this purpose.

⁵ The E.C. Electrocraft Model E-552-M Torque Measurement drive motor, available from Republic Supply Co., San Jose, CA, has been found suitable for this purpose.