



Standard Test Method for Motor Life Evaluation of an Upright Vacuum Cleaner¹

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1. Scope

1.1 This test method covers motor life evaluation of household or commercial single and dual motor upright vacuum cleaners (uprights with separate motors for creating the vacuum and driving the floor brush). Self-propelled or power-assist cleaners are not within the scope of this test method.

1.2 This test method is limited to evaluation of the upright vacuum cleaner electric motor(s).

1.3 This test method provides a test to determine operating life of the motor(s), before servicing is needed, by an accelerated laboratory procedure. Motor(s) are tested while mounted and operated in the upright vacuum cleaner.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units, which are provided for information only and are not considered standard.

1.5 *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

D75 Practice for Sampling Aggregates

E337 Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry-Bulb Temperatures)

F431 Specification for Air Performance Measurement Plenum Chamber for Vacuum Cleaners

F608 Test Method for Evaluation of Carpet Embedded Dirt Removal Effectiveness of Household/Commercial Vacuum Cleaners

¹ This test method is under the jurisdiction of ASTM Committee F11 on Vacuum Cleaners and is the direct responsibility of Subcommittee F11.30 on Durability-Reliability.

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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.

F655 Specification for Test Carpets and Pads for Vacuum Cleaner Testing

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *motor life*—limited by failure of motor. Failure is motor stoppage. In the case of a dual motor upright, the test will be continued until both motors (vacuum motor and floor brush motor) have failed. The motor that fails first will be replaced so that the test may continue on the other motor. The motor life of each motor will be recorded separately.

3.1.1.1 *Discussion*—Any failure integral with the motor, such as armature assembly, field assembly, housing(s), bearings, motor cooling fan or primary air moving fan, brush assemblies, motor mounted nonresettable thermal protection devices, or any other component judged to be integral with the motor, shall be judged as motor stoppage.

4. Significance and Use

4.1 The test results provide an indication of the motor life of an electric upright vacuum cleaner. End of motor life will be judged in accordance with Section 3.

5. Apparatus and Materials

5.1 *Voltage Regulator System*, to control the input voltage to the vacuum cleaner. The regulator system shall be capable of maintaining the vacuum cleaner's rated voltage $\pm 1\%$ and rated frequency ± 1 Hz, having a wave form that is essentially sinusoidal with 3 % maximum harmonic distortion for the duration of the test.

5.2 *Voltmeter*, to provide measurements accurate to within $\pm 1\%$.

5.3 *Timer and Switch*, having the capacity to control the off/on duty cycle of the cleaner during the life test.

5.4 *Sharp Edge Orifice Plate*—a 1¼-in. (32-mm) diameter orifice shall be in accordance with Fig. 2 of Specification F431.

5.5 *Wattmeter*, to provide measurements accurate to within 1 %.

5.6 *Plenum Chamber*, conforming to the plenum chamber described in Specification F431.

5.7 *Water Manometer*, or equivalent instrument measuring in increments of 0.1 in. (2.54 mm).