



Standard Test Method for Motor Life Evaluation of a Built-In (Central Vacuum) Vacuum Cleaner¹

This standard is issued under the fixed designation F884; 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 test method is limited to motor life evaluation of central vacuum cleaners.

1.2 This test method provides a test to determine operating life of the motor, before servicing is needed, by an accelerated laboratory procedure. The motor is tested while mounted and is operated in central vacuum cleaner.

1.3 The values as stated in inch-pound units are to be regarded as the standard. The values in parentheses are for information only.

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

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

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *failure*—motor stoppage.

3.1.2 *motor life*—limited by the failure of the motor. Any failure integral with motor, such as armature assembly, field

assembly, housing(s), bearings, motor cooling fan and primary air moving fan, or both, brush assemblies, motormounted nonresetable 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 vacuum cleaner. The end of the 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 must be capable of maintaining the Central Vacuum's rated voltage $\pm 1\%$ and rated frequency ± 1 Hz with a waveform 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*—The timer and switch shall have the capacity to control the off/on duty cycle of the cleaner during the life test.

5.4 *Sharp Edge Orifice Plate*—The orifice, 0.75 in. (19.05 mm) in diameter, shall be in accordance with the figure illustrating orifice plate detail in Specification **F431**.

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

5.6 *Plenum Chamber*, in accordance with the plenum chamber described in Specification **F431**.

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

5.8 *Barometer*, with an accuracy to ± 0.05 in. (1.27 mm) Hg, capable of measuring uncorrected barometric pressure (test station pressure) with scale division 0.02 in. (0.51 mm) or finer.

5.9 *Thermometer*, having a range from 18 to 80°F (−8 to 27°C) and graduated in 1°F (0.5°C) increments.

5.10 *Psychrometer*—The psychrometer shall meet the requirements of Test Method **E337** with thermometers graduated in increments of 1°F (0.5°C).

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.

Current edition approved Oct. 1, 2016. Published October 2016. Originally approved in 1990. Last previous edition approved in 2011 as F884 – 01 (2011). DOI: 10.1520/F0884-01R16.

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.