



Standard Test Method for Straight Line Movement of Vacuum Cleaners While Cleaning Carpets¹

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1. Scope

1.1 This test method covers a measurement of the relative work required to move an upright, canister, stick, or combination vacuum cleaner in a straight line with forward and backward stroking on a selection of typical carpeted surfaces.

1.1.1 This test method measures only the horizontal component of work required to move the vacuum cleaner on carpet.

1.2 This test method can be used in the testing of household and commercial vacuum cleaners.

1.3 This test method measures the relative work needed to move the vacuum cleaner with its motor or motors in operation.

1.4 This test method applies to the vacuum cleaning of carpets only.

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

1.6 *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

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

F655 Specification for Test Carpets and Pads for Vacuum Cleaner Testing

¹ This test method is under the jurisdiction of ASTM Committee F11 on Vacuum Cleaners and is the direct responsibility of Subcommittee F11.20 on Performance (Test Methods).

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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.

F884 Test Method for Motor Life Evaluation of a Built-In (Central Vacuum) Vacuum Cleaner

F922 Test Method for Motor Life Evaluation of an Electric Motorized Nozzle

F1038 Test Method for Motor Life Evaluation of a Canister, Hand-held, Stick, and Utility Type Vacuum Cleaner Without a Driven Agitator

F1334 Test Method for Determining A-Weighted Sound Power Level of Vacuum Cleaners

3. Summary of Test Method

3.1 Mobility equipment is to be constructed and used to push the vacuum cleaner back and forth on the test carpet in a prescribed manner during the test. The mobility equipment is to employ a handle clamp assembly with a strain gage, to be attached to the vacuum cleaner handle. This strain gage measures the horizontal forces involved in moving only the vacuum on the test carpet.

3.2 Simultaneously, the incremental distance that the vacuum cleaner moves is also monitored and collected. The force and distance measurements are then used for calculating the work required to push and pull the vacuum on the test carpet.

3.3 The design of the mobility equipment used in this method is left to the user to develop and construct as there are numerous design approaches that may be employed for this evaluation. The mobility equipment may be designed to move the vacuum automatically or manually. Photographs of one design used in the industry to move the vacuum without the assistance of a technician is provided in **Figs. 1-3**. It is highly recommended that data acquisition and computerization, with a data sampling rate of at least ten samples per second, be utilized to improve the speed and accuracy of data measurements.

4. Significance and Use

4.1 This test method measures the horizontal component of the relative work required by the user during the cleaning operation for the movement of a vacuum cleaner in the home or other cleaning location on standardized laboratory carpeting. Work is determined from the forces measured in the horizontal direction only by the mobility equipment.