



Designation: F 820 – 99

An American National Standard

Standard Test Method for Measuring Air Performance Characteristics of Central Vacuum Cleaning Systems¹

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1. Scope

1.1 This test method covers procedures for determining air performance characteristics of household central vacuum cleaning systems, which use a flexible cleaning hose assembly and incorporates a series universal motor(s). This test method does not apply to the carpet cleaning mode of operation where dirt or debris is involved.

1.2 These tests and calculations include determination of suction, airflow, air power, maximum air power, and input power under standard operating conditions (see Note 1).

NOTE 1—For more information on air performance characteristics, see Refs (1-6).²

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are provided 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.* A specific precautionary statement is given in Note 2.

2. Referenced Documents

2.1 ASTM Standards:

E 1 Specification for ASTM Thermometers³

F 395 Terminology Relating to Vacuum Cleaners⁴

F 431 Specification for Air Performance Measurement Plenum Chamber for Vacuum Cleaners⁴

2.2 AMCA Standard:

210-85 Laboratory Methods of Testing Fans for Rating⁵

3. Terminology

3.1 Definitions:

3.1.1 *air power, AP, W, n*—in a vacuum cleaner, the net time rate of work performed by an air stream while expending energy to produce an airflow by a vacuum cleaner under specified air resistance conditions.

3.1.2 *automatic bleed valve, n*—any device a part of a vacuum cleaner's design, which automatically introduces an intentional leak within the vacuum cleaner's system when manufacturer specified conditions are met.

3.1.3 *corrected airflow, Q, cfm, n*—in a vacuum cleaner, the volume of air movement per unit of time under standard atmospheric conditions.

3.1.4 *input power, W, n*—the rate at which electrical energy is absorbed by a vacuum cleaner.

3.1.5 *model, n*—the designation of a group of vacuum cleaners having the same mechanical and electrical construction with only cosmetic or nonfunctional differences.

3.1.6 *population, n*—the total of all units of a particular model vacuum cleaner being tested.

3.1.7 *repeatability limit (r), n*—the value below which the absolute difference between two individual test results obtained under repeatability conditions may be expected to occur with a probability of approximately 0.95 (95 %).

3.1.8 *reproducibility limit (R), n*—the value below which the absolute difference between two test results obtained under reproducibility conditions may be expected to occur with a probability of approximately 0.95 (95 %).

3.1.9 *repeatability standard deviation (S_r), n*—the standard deviation of test results obtained under repeatability conditions.

3.1.10 *reproducibility standard deviation (S_R), n*—the standard deviation of test results obtained under reproducibility conditions.

3.1.11 *sample, n*—a group of vacuum cleaners taken from a large collection of vacuum cleaners of one particular model, which serves to provide information that may be used as a basis for making a decision concerning the larger collection.

3.1.12 *standard air density, ρ_{std} , lb/ft³, n*—atmospheric air density of 0.075 lb/ft³ (1.2014 kg/m³).

3.1.12.1 *Discussion*—This value of air density corresponds to atmospheric air at a temperature of 68 °F (20 °C), 14.696 psi

¹ This test method is under the jurisdiction of ASTM Committee F11 on Vacuum Cleaners and is the direct responsibility of Subcommittee F11.22 on Air Performance.

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² The boldface numbers in parentheses refer to the list of references at the end of this standard.

³ *Annual Book of ASTM Standards*, Vol 14.03.

⁴ *Annual Book of ASTM Standards*, Vol 15.08.

⁵ Available from Air Movement and Control Association, Inc., 30 West University Dr., Arlington Heights, IL 60004-1893.