



Designation: F655 – 24

# Standard Specification for Test Carpets and Pads for Vacuum Cleaner Testing<sup>1</sup>

This standard is issued under the fixed designation F655; 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 reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

## 1. Scope

1.1 This specification provides construction details and a replacement procedure for the standard carpet and pad to be used when testing vacuum cleaners.

NOTE 1—The F11.21 subcommittee is actively pursuing new market-relevant carpets with the assistance of the carpet industry. Section 5, Table 1, has been revised to remove carpets listed in this specification that are no longer commercially available (that is, plush, Frieze).

1.2 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.

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

- F555 Test Method for Motor Life Evaluation of an Upright Vacuum Cleaner
- F608 Test Method for Evaluation of Carpet Embedded Dirt Removal Effectiveness of Household/Commercial Vacuum Cleaners
- F922 Test Method for Motor Life Evaluation of an Electric Motorized Nozzle
- F1284 Test Method for Evaluating Carpet Embedded Dirt Removal Effectiveness of Residential Central Vacuum Cleaning Systems
- F1334 Test Method for Determining A-Weighted Sound Power Level of Vacuum Cleaners

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee F11 on Vacuum Cleaners and is the direct responsibility of Subcommittee F11.21 on Cleanability.

Current edition approved July 1, 2024. Published July 2024. Originally approved in 1980. Last previous edition approved in 2013 as F655 – 13, which was withdrawn in 2022 and reinstated in 2024. DOI: 10.1520/F0655-24.

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [astm.org/contact](mailto:astm.org/contact). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

F1409 Test Method for Straight Line Movement of Vacuum Cleaners While Cleaning Carpets

F1411 Practice for Presenting Selected Information on Vacuum Cleaners for Consumer Use

F1601 Test Method for Motor Life Evaluation of an Electric Motorized Nozzle for Central Vacuum Cleaning Systems

F1692 Test Method for Life Evaluation of a Turbine-Powered Nozzle for Household Central Vacuum Cleaning Systems

F2609 Test Method for Litter-Cleaning Effectiveness of Vacuum Cleaners

F2756 Test Method for Determining Energy Consumption of Vacuum Cleaners

F2797 Test Method for Evaluating Edge Cleaning Effectiveness of Vacuum Cleaners

### 2.2 IEC Standards:<sup>3</sup>

TS 62885–1 Surface cleaning appliances — Part 1: General requirements on test material and test equipment

### 2.3 International Standards:<sup>4</sup>

BS 4223 Methods of test for determination of constructional details of carpets with yarn pile

BS 8459 Determination of extractable matter in textiles. Method

EN 1307 Textile floor coverings. Classification

ISO 1763 Textile floor coverings — Determination of number of tufts and/or loops per unit length and per unit area

ISO 1765 Machine-made textile floor coverings — Determination of thickness

ISO 1766 Textile floor coverings — Determination of thickness of pile above the substrate

ISO 1833 Textiles — Quantitative chemical analysis — Part 1: General principles of testing

ISO 2060 Textiles — Yarn from packages — Determination of linear density (mass per unit length) by the skein method

ISO 2061 Textiles — Determination of twist in yarns — Direct counting method

ISO 2424 Textile floor coverings — Vocabulary

<sup>3</sup> Available from International Electrotechnical Commission (IEC), 3, rue de Varembe, 1st floor, P.O. Box 131, CH-1211, Geneva 20, Switzerland, <https://www.iec.ch>.

<sup>4</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

**TABLE 1 Level Loop Carpet Construction Specifications<sup>A</sup>**

| Type                                                               | Woven Level Loop                                          | Tolerance | Test Method/Standard <sup>B</sup> |
|--------------------------------------------------------------------|-----------------------------------------------------------|-----------|-----------------------------------|
| Pile composition                                                   | wool 4.3                                                  |           |                                   |
| Yarn count                                                         | 4.2/3                                                     |           | ISO 2060                          |
| Yarn blend                                                         | 80/20 wool – PA6, (nylon)6                                |           |                                   |
| Wool composition                                                   | 50 % New Zealand – 50 % British                           |           | ISO 1833                          |
| Average fiber length                                               | 80 mm                                                     |           | ISO 6989                          |
| Spinning process                                                   | carded wool                                               |           |                                   |
| Spin rotations per meter                                           | 205                                                       |           | ISO 2061                          |
| Spin rotation direction                                            | Z                                                         |           | ISO 2061                          |
| Ply twist coefficient                                              | 205                                                       |           | ISO 2061                          |
| Twisted rotation direction                                         | S                                                         |           | ISO 2061                          |
| Moth protection treatment                                          | 0.1 % eulan                                               |           |                                   |
| Color dye (pigment)                                                | yellow chemacide E2GL, red alpacideLBG,<br>blue alizarine |           |                                   |
| Residual oil content                                               | <0.40 %                                                   |           | BS 8459                           |
| Method of manufacturing                                            | Jackard weaving                                           |           | ISO 2424                          |
| Color                                                              | dark, one color                                           |           | ISO 2424                          |
| Backing                                                            | jute and synthetic + latex                                |           | ISO 2424                          |
| Type                                                               | loop pile                                                 |           | ISO 2424                          |
| Total thickness                                                    | 7.0 mm                                                    | ±5 %      | ISO 1765                          |
| Thickness of pile above the substrate                              | 4.7 mm                                                    | ±5 %      | ISO 1766                          |
| Total mass/m <sup>2</sup>                                          | 1832 g/m <sup>2</sup> gcedt                               | ±5 %      | ISO 8543                          |
| Total mass of pile <sup>C</sup> above the substrate/m <sup>2</sup> | 843 g/m <sup>2</sup> gcedt                                | ±5 %      | ISO 8543                          |
| Number of tufts/m <sup>2</sup>                                     | 105 805                                                   | ±5 %      | ISO 1763                          |
| Tuft density                                                       | see number of knots                                       | ±6 %      | BS 4223                           |
| Reed                                                               | 320                                                       |           |                                   |
| Shots                                                              | 320                                                       |           |                                   |
| Standard manufactured width                                        | 68 cm                                                     |           |                                   |
| Use class                                                          | XXX                                                       |           | EN 1307                           |
| Latex—specification                                                | TX 9262                                                   |           |                                   |

<sup>A</sup> Information for the central source for the level loop test carpet is in footnote 5.

<sup>B</sup> ASTM Standards, where used: Test Method **F555**, Test Method **F608**, Test Method **F922**, Test Method **F1284**, Test Method **F1409**, Practice **F1411**, Test Method **F1601**, Test Method **F1692**, Test Method **F2756**.

<sup>C</sup> Effective pile, not the total pile, determined on finished carpet.

**ISO 6989 Textile fibres — Determination of length and length distribution of staple fibres (by measurement of single fibres)**

**ISO 8543 Textile floor coverings — Methods for determination of mass**

### 3. Basis of Selection

3.1 These standard carpets and pads are intended to provide a database and shall meet the following requirements:

3.1.1 Representative of carpets currently in residential/commercial use.

3.1.2 Reasonable anticipation of continued availability.

3.1.3 Compatible with other ASTM Committee F11 methods.

3.1.4 Provide a separation of cleaning effectiveness ratings between products with good reliability and repeatability.

### 4. Classification

4.1 The carpet types shall be classified according to accepted carpet industry practice, such as shag, multilevel, plush, etc.

### 5. Physical Requirements

5.1 *Carpets*<sup>5</sup>—The following carpet types and construction have been found acceptable for use in vacuum cleaner testing. They shall be made in accordance with the physical requirements given in **Table 1**, **Table 2**, and **Table 3**.

NOTE 2—A variance of ±7 % in face weight is allowable per HUD guidelines. When a new construction is needed, the proposed custom tufted test carpets should be subjected to construction verification as well as cleanliness testing prior to acceptance for use.

5.2 *Padding*<sup>6</sup>—Sponge rubber type of pliable construction with a reinforcing scrim. See **Table 4** for a description of the construction.

<sup>5</sup> The central source for the level loop test carpet currently is SGS-IBR, 11599 Morrissey Rd., Grass Lake, MI 49240. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,<sup>1</sup> which you may attend.

<sup>6</sup> The sole source of supply of the padding (Coronado, product code BV0252, manufactured by Leggett & Platt Flooring Products) is SDL Atlas, 3934 Airway Dr., Rock Hill, SC 29732. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,<sup>1</sup> which you may attend.