



Designation: E11 – 20

# Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves<sup>1</sup>

This standard is issued under the fixed designation E11; 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.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

## 1. Scope\*

1.1 This document specifies the technical requirements for; the woven wire test sieve cloth (sieve cloth) used in test sieves, the construction of test sieves, standard and non-standard test sieve frame sizes, and test procedures used to inspect sieve cloth and the test sieves. This specification applies to test sieves manufactured with sieve cloth having a nominal aperture size ranging from 125 millimetres (mm) down to 20 micrometres (μm).

1.2 Additional reference information can be found in Specifications [E161](#), [E323](#), [E2016](#), and in Test Methods [C430](#) and [E2427](#).

1.3 The values stated in SI units shall be considered standard for the dimensions of the sieve cloth openings and the wire diameters used in the sieve cloth. The values stated in inch-pound units shall be considered standard with regard to the sieve frames, pans, and covers.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *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.*

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee [E29](#) on Particle and Spray Characterization and is the direct responsibility of Subcommittee [E29.01](#) on Sieves, Sieving Methods, and Screening Media.

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## 2. Referenced Documents

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

[C430](#) Test Method for Fineness of Hydraulic Cement by the 45-μm (No. 325) Sieve

[E161](#) Specification for Electroformed Material and Test Sieves

[E323](#) Specification for Perforated-Plate Sieves for Testing Purposes

[E1638](#) Terminology Relating to Sieves, Sieving Methods, and Screening Media

[E2016](#) Specification for Industrial Woven Wire Cloth

[E2427](#) Test Method for Acceptance by Performance Testing for Sieves

### 2.2 ASTM Manual:<sup>2</sup>

[Manual 32](#) Test Sieving Methods: Guidelines for Establishing Sieve Analysis Procedures; 5<sup>th</sup> Edition

### 2.3 Federal Standard:<sup>3</sup>

[Fed. Std. No. 123](#) Marking for Shipment (Civil Agencies)

### 2.4 Military Standard:<sup>3</sup>

[MIL-STD-129](#) Marking for Shipment and Storage

### 2.5 ISO Standard:<sup>4</sup>

[ISO 3310-1](#) Test Sieves—Technical Requirements and Testing – Part 1: Test Sieves of Metal Wire Cloth

## 3. Terminology

3.1 *Definitions*—Additional terms can be found in Terminology [E1638](#).

3.1.1 *aperture, n*—the dimension defining an opening in a screening surface.

3.1.2 *backing cloth, n*—a wire mesh support layer used directly under the sieve cloth with an opening coarser than the sieve designation.

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

<sup>3</sup> Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://www.dodssp.daps.mil>.

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

\*A Summary of Changes section appears at the end of this standard



TABLE 1 Nominal Dimensions and Permissible Variations for Sieve Cloth and Compliance, Inspection and Calibration Test Sieves

| (1)      | (2a)              | (2b)               | (3) <sup>A</sup>                         | (4)                                             | (5)                                             | (6)                                                 | (7)                                           | (8)                              | (9) <sup>B, C</sup>             | (10)                             | (11) <sup>B, C</sup>            | (12)                             | (13)                              | (14)                                 | (15) |
|----------|-------------------|--------------------|------------------------------------------|-------------------------------------------------|-------------------------------------------------|-----------------------------------------------------|-----------------------------------------------|----------------------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|-----------------------------------|--------------------------------------|------|
| Standard | Sieve Designation |                    | Nominal<br>Sieve<br>Opening<br>mm<br>in. | ±Y<br>Variation<br>for Average<br>Opening<br>mm | +X<br>Maximum<br>Variation<br>for Opening<br>mm | Resulting<br>Maximum<br>Individual<br>Opening<br>mm | Compliance Sieves                             |                                  | Inspection Sieves               |                                  | Calibration Sieves              |                                  | Typical<br>Wire<br>Diameter<br>mm | Permissible Average<br>Wire Diameter |      |
|          | U.S. Alternative  | Supplementary Size |                                          |                                                 |                                                 |                                                     | Sample<br>Openings<br>per 100 ft <sup>2</sup> | Maximum<br>Standard<br>Deviation | Sample<br>Openings<br>per Sieve | Maximum<br>Standard<br>Deviation | Sample<br>Openings<br>per Sieve | Maximum<br>Standard<br>Deviation |                                   | Min                                  | Max  |
| 125      | 5 in.             |                    | 5.00                                     | 3.30                                            | 4.06                                            | 129.06                                              | 20                                            | —                                | all                             | —                                | all                             | —                                | 8.00                              | 6.8                                  | 9.2  |
|          |                   | 112                | 4.41                                     | 2.96                                            | 3.74                                            | 115.74                                              | 20                                            | —                                | all                             | —                                | all                             | —                                | 8.00                              | 6.8                                  | 9.2  |
| 106      | 4.24 in.          |                    | 4.24                                     | 2.80                                            | 3.59                                            | 109.59                                              | 20                                            | —                                | all                             | —                                | all                             | —                                | 6.30                              | 5.4                                  | 7.2  |
| 100      | 4 in.             |                    | 4.00                                     | 2.65                                            | 3.44                                            | 103.44                                              | 20                                            | —                                | all                             | —                                | all                             | —                                | 6.30                              | 5.4                                  | 7.2  |
| 90       | 3½ in.            |                    | 3.50                                     | 2.39                                            | 3.18                                            | 93.18                                               | 20                                            | —                                | all                             | —                                | all                             | —                                | 6.30                              | 5.4                                  | 7.2  |
|          |                   | 80                 | 3.15                                     | 2.13                                            | 2.91                                            | 82.91                                               | 20                                            | —                                | all                             | —                                | all                             | —                                | 6.30                              | 5.4                                  | 7.2  |
| 75       | 3 in.             |                    | 3.00                                     | 2.00                                            | 2.78                                            | 77.78                                               | 20                                            | —                                | all                             | —                                | all                             | —                                | 6.30                              | 5.4                                  | 7.2  |
|          |                   | 71                 | 2.80                                     | 1.89                                            | 2.67                                            | 73.67                                               | 20                                            | —                                | all                             | —                                | all                             | —                                | 5.60                              | 4.8                                  | 6.4  |
| 63       | 2½ in.            |                    | 2.50                                     | 1.69                                            | 2.44                                            | 65.44                                               | 20                                            | —                                | all                             | —                                | all                             | —                                | 5.60                              | 4.8                                  | 6.4  |
|          |                   | 56                 | 2.20                                     | 1.50                                            | 2.24                                            | 58.24                                               | 20                                            | —                                | all                             | —                                | all                             | —                                | 5.00                              | 4.3                                  | 5.8  |
| 53       | 2.12 in.          |                    | 2.12                                     | 1.42                                            | 2.15                                            | 55.15                                               | 20                                            | —                                | all                             | —                                | all                             | —                                | 5.00                              | 4.3                                  | 5.8  |
| 50       | 2 in.             |                    | 2.00                                     | 1.34                                            | 2.06                                            | 52.06                                               | 20                                            | —                                | all                             | —                                | all                             | —                                | 5.00                              | 4.3                                  | 5.8  |
| 45       | 1¾ in.            |                    | 1.75                                     | 1.21                                            | 1.91                                            | 46.91                                               | 20                                            | —                                | all                             | —                                | all                             | —                                | 4.50                              | 3.8                                  | 5.2  |
|          |                   | 40                 | 1.57                                     | 1.08                                            | 1.75                                            | 41.75                                               | 20                                            | —                                | all                             | —                                | all                             | —                                | 4.50                              | 3.8                                  | 5.2  |
| 37.5     | 1½ in.            |                    | 1.50                                     | 1.01                                            | 1.67                                            | 39.17                                               | 20                                            | 1.103                            | all                             | —                                | all                             | —                                | 4.50                              | 3.8                                  | 5.2  |
|          |                   | 35.5               | 1.40                                     | 0.961                                           | 1.60                                            | 37.10                                               | 20                                            | 1.035                            | all                             | —                                | all                             | —                                | 4.00                              | 3.4                                  | 4.6  |
| 31.5     | 1¼ in.            |                    | 1.25                                     | 0.855                                           | 1.47                                            | 32.97                                               | 20                                            | 0.907                            | all                             | —                                | all                             | —                                | 4.00                              | 3.4                                  | 4.6  |
|          |                   | 28                 | 1.10                                     | 0.762                                           | 1.35                                            | 29.35                                               | 20                                            | 0.802                            | all                             | —                                | all                             | —                                | 3.55                              | 3.0                                  | 4.1  |
| 26.5     | 1.06 in.          |                    | 1.06                                     | 0.722                                           | 1.29                                            | 27.79                                               | 20                                            | 0.758                            | all                             | —                                | all                             | —                                | 3.55                              | 3.0                                  | 4.1  |
| 25       | 1.00 in.          |                    | 1.00                                     | 0.682                                           | 1.24                                            | 26.24                                               | 20                                            | 0.715                            | all                             | —                                | all                             | —                                | 3.55                              | 3.0                                  | 4.1  |
| 22.4     | ¾ in.             |                    | 0.875                                    | 0.613                                           | 1.14                                            | 23.54                                               | 150                                           | 0.641                            | 15                              | 0.431                            | 30                              | 0.460                            | 3.55                              | 3.0                                  | 4.1  |
|          |                   | 20                 | 0.787                                    | 0.548                                           | 1.05                                            | 21.05                                               | 150                                           | 0.575                            | 15                              | 0.387                            | 30                              | 0.413                            | 3.15                              | 2.7                                  | 3.6  |
| 19       | ¾ in.             |                    | 0.750                                    | 0.522                                           | 1.01                                            | 20.01                                               | 150                                           | 0.548                            | 15                              | 0.368                            | 30                              | 0.393                            | 3.15                              | 2.7                                  | 3.6  |
| 16       | ⅝ in.             |                    | 0.709                                    | 0.495                                           | 0.97                                            | 18.97                                               | 150                                           | 0.521                            | 15                              | 0.350                            | 30                              | 0.374                            | 3.15                              | 2.7                                  | 3.6  |
|          |                   | 14                 | 0.625                                    | 0.441                                           | 0.89                                            | 16.89                                               | 150                                           | 0.467                            | 15                              | 0.314                            | 30                              | 0.335                            | 3.15                              | 2.7                                  | 3.6  |
|          |                   |                    | 0.551                                    | 0.387                                           | 0.81                                            | 14.81                                               | 150                                           | 0.414                            | 15                              | 0.278                            | 30                              | 0.297                            | 2.80                              | 2.4                                  | 3.2  |
| 13.2     | 0.530 in.         |                    | 0.365                                    | 0.365                                           | 0.78                                            | 13.98                                               | 150                                           | 0.393                            | 15                              | 0.264                            | 30                              | 0.282                            | 2.80                              | 2.4                                  | 3.2  |
| 12.5     | ½ in.             |                    | 0.500                                    | 0.346                                           | 0.75                                            | 13.25                                               | 150                                           | 0.374                            | 15                              | 0.251                            | 30                              | 0.268                            | 2.50                              | 2.1                                  | 2.9  |
| 11.2     | ⅞ in.             |                    | 0.438                                    | 0.311                                           | 0.69                                            | 11.89                                               | 150                                           | 0.340                            | 15                              | 0.229                            | 30                              | 0.244                            | 2.50                              | 2.1                                  | 2.9  |
|          |                   | 10                 | 0.394                                    | 0.279                                           | 0.64                                            | 10.64                                               | 150                                           | 0.308                            | 15                              | 0.207                            | 30                              | 0.221                            | 2.50                              | 2.1                                  | 2.9  |
| 9.5      | ⅜ in.             |                    | 0.375                                    | 0.265                                           | 0.61                                            | 10.11                                               | 150                                           | 0.294                            | 15                              | 0.198                            | 30                              | 0.211                            | 2.24                              | 1.9                                  | 2.6  |
|          |                   | 9                  | 0.354                                    | 0.251                                           | 0.59                                            | 9.59                                                | 150                                           | 0.281                            | 15                              | 0.189                            | 30                              | 0.202                            | 2.24                              | 1.9                                  | 2.6  |
| 8        | ⅝ in.             |                    | 0.312                                    | 0.224                                           | 0.54                                            | 8.54                                                | 150                                           | 0.254                            | 15                              | 0.171                            | 30                              | 0.182                            | 2.00                              | 1.7                                  | 2.3  |
|          |                   | 7.1                | 0.280                                    | 0.200                                           | 0.50                                            | 7.60                                                | 150                                           | 0.230                            | 15                              | 0.155                            | 30                              | 0.165                            | 1.80                              | 1.5                                  | 2.1  |
| 6.7      | 0.265 in.         |                    | 0.265                                    | 0.189                                           | 0.48                                            | 7.18                                                | 150                                           | 0.219                            | 15                              | 0.147                            | 30                              | 0.157                            | 1.80                              | 1.5                                  | 2.1  |
| 6.3      | ¼ in.             |                    | 0.250                                    | 0.178                                           | 0.46                                            | 6.78                                                | 150                                           | 0.208                            | 15                              | 0.140                            | 30                              | 0.149                            | 1.80                              | 1.5                                  | 2.1  |
| 5.6      | No. 3½            |                    | 0.223                                    | 0.159                                           | 0.42                                            | 6.02                                                | 150                                           | 0.189                            | 15                              | 0.127                            | 30                              | 0.136                            | 1.60                              | 1.3                                  | 1.9  |
|          |                   | 5                  | 0.197                                    | 0.142                                           | 0.39                                            | 5.39                                                | 150                                           | 0.172                            | 15                              | 0.116                            | 30                              | 0.123                            | 1.60                              | 1.3                                  | 1.9  |
| 4.75     | No. 4             |                    | 0.187                                    | 0.135                                           | 0.37                                            | 5.12                                                | 150                                           | 0.165                            | 15                              | 0.111                            | 30                              | 0.118                            | 1.60                              | 1.3                                  | 1.9  |
|          |                   | 4.5                | 0.177                                    | 0.128                                           | 0.36                                            | 4.86                                                | 150                                           | 0.158                            | 15                              | 0.106                            | 30                              | 0.113                            | 1.40                              | 1.2                                  | 1.7  |
| 4        | No. 5             |                    | 0.157                                    | 0.114                                           | 0.33                                            | 4.33                                                | 150                                           | 0.143                            | 15                              | 0.096                            | 30                              | 0.103                            | 1.40                              | 1.2                                  | 1.7  |
|          |                   | 3.55               | 0.140                                    | 0.102                                           | 0.30                                            | 3.85                                                | 200                                           | 0.130                            | 20                              | 0.092                            | 40                              | 0.097                            | 1.25                              | 1.06                                 | 1.50 |
| 3.35     | No. 6             |                    | 0.132                                    | 0.096                                           | 0.29                                            | 3.64                                                | 200                                           | 0.125                            | 20                              | 0.088                            | 40                              | 0.093                            | 1.25                              | 1.06                                 | 1.50 |
|          |                   | 3.15               | 0.124                                    | 0.091                                           | 0.28                                            | 3.43                                                | 200                                           | 0.119                            | 20                              | 0.084                            | 40                              | 0.089                            | 1.25                              | 1.06                                 | 1.50 |
| 2.8      | No. 7             |                    | 0.110                                    | 0.081                                           | 0.26                                            | 3.06                                                | 200                                           | 0.108                            | 20                              | 0.076                            | 40                              | 0.081                            | 1.12                              | 0.95                                 | 1.30 |
|          |                   | 2.5                | 0.0984                                   | 0.073                                           | 0.24                                            | 2.74                                                | 200                                           | 0.099                            | 20                              | 0.070                            | 40                              | 0.074                            | 1.00                              | 0.85                                 | 1.15 |
| 2.36     | No. 8             |                    | 0.0937                                   | 0.069                                           | 0.23                                            | 2.59                                                | 200                                           | 0.095                            | 20                              | 0.067                            | 40                              | 0.071                            | 1.00                              | 0.85                                 | 1.15 |
|          |                   | 2.24               | 0.0882                                   | 0.065                                           | 0.22                                            | 2.46                                                | 200                                           | 0.091                            | 20                              | 0.064                            | 40                              | 0.068                            | 0.90                              | 0.77                                 | 1.04 |
| 2        | No. 10            |                    | 0.0787                                   | 0.059                                           | 0.20                                            | 2.20                                                | 250                                           | 0.083                            | 25                              | 0.060                            | 50                              | 0.064                            | 0.90                              | 0.77                                 | 1.04 |
|          |                   | 1.8                | 0.0709                                   | 0.053                                           | 0.19                                            | 1.99                                                | 250                                           | 0.077                            | 25                              | 0.056                            | 50                              | 0.059                            | 0.80                              | 0.68                                 | 0.92 |
| 1.7      | No. 12            |                    | 0.0661                                   | 0.050                                           | 0.18                                            | 1.88                                                | 250                                           | 0.074                            | 25                              | 0.054                            | 50                              | 0.057                            | 0.80                              | 0.68                                 | 0.92 |



TABLE 1 Continued

| (1)      | (2a)              | (2b)               | (3) <sup>A</sup>      | (4)                              | (5)                              | (6)                                  | (7)                                     | (8)                        | (9) <sup>B, C</sup>       | (10)                       | (11) <sup>B, C</sup>      | (12)                       | (13)                  | (14)                              | (15)  |
|----------|-------------------|--------------------|-----------------------|----------------------------------|----------------------------------|--------------------------------------|-----------------------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|-----------------------|-----------------------------------|-------|
| Standard | Sieve Designation |                    | Nominal Sieve Opening | ±Y Variation for Average Opening | +X Maximum Variation for Opening | Resulting Maximum Individual Opening | Compliance Sieves                       |                            | Inspection Sieves         |                            | Calibration Sieves        |                            | Typical Wire Diameter | Permissible Average Wire Diameter |       |
|          | U.S. Alternative  | Supplementary Size |                       |                                  |                                  |                                      | Sample Openings per 100 ft <sup>2</sup> | Maximum Standard Deviation | Sample Openings per Sieve | Maximum Standard Deviation | Sample Openings per Sieve | Maximum Standard Deviation |                       | Min                               | Max   |
| 1.4      | No. 14            | 1.6                | 0.0630                | 0.047                            | 0.17                             | 1.77                                 | 250                                     | 0.070                      | 25                        | 0.051                      | 50                        | 0.054                      | 0.80                  | 0.68                              | 0.92  |
|          |                   |                    | 0.0555                | 0.042                            | 0.16                             | 1.56                                 | 400                                     | 0.064                      | 40                        | 0.050                      | 80                        | 0.052                      | 0.71                  | 0.60                              | 0.82  |
| 1.18     | No. 16            | 1.25               | 0.0492                | 0.038                            | 0.15                             | 1.40                                 | 400                                     | 0.058                      | 40                        | 0.045                      | 80                        | 0.047                      | 0.63                  | 0.54                              | 0.72  |
|          |                   |                    | 0.0469                | 0.036                            | 0.14                             | 1.32                                 | 400                                     | 0.056                      | 40                        | 0.043                      | 80                        | 0.045                      | 0.63                  | 0.54                              | 0.72  |
| 1        | No. 18            | 1.12               | 0.0441                | 0.034                            | 0.14                             | 1.26                                 | 400                                     | 0.054                      | 40                        | 0.042                      | 80                        | 0.044                      | 0.56                  | 0.48                              | 0.64  |
|          |                   |                    | 0.0394                | 0.030                            | 0.13                             | 1.13                                 | 400                                     | 0.050                      | 40                        | 0.039                      | 80                        | 0.040                      | 0.56                  | 0.48                              | 0.64  |
| µm       |                   | µm                 | in.                   | µm                               | µm                               | µm                                   |                                         |                            |                           |                            |                           |                            | mm                    |                                   |       |
| 850      | No. 20            | 900                | 0.0354                | 27.6                             | 118                              | 1018                                 | 400                                     | 45.51                      | 40                        | 35.22                      | 80                        | 36.74                      | 0.500                 | 0.43                              | 0.58  |
|          |                   |                    | 0.0331                | 26.2                             | 114                              | 964                                  | 400                                     | 43.66                      | 40                        | 33.79                      | 80                        | 35.25                      | 0.500                 | 0.43                              | 0.58  |
| 710      | No. 25            | 800                | 0.0315                | 24.8                             | 109                              | 909                                  | 400                                     | 41.79                      | 40                        | 32.34                      | 80                        | 33.74                      | 0.450                 | 0.38                              | 0.52  |
|          |                   |                    | 0.0278                | 22.2                             | 101                              | 811                                  | 500                                     | 38.36                      | 50                        | 30.43                      | 100                       | 31.62                      | 0.450                 | 0.38                              | 0.52  |
| 600      | No. 30            | 630                | 0.0248                | 19.9                             | 93                               | 723                                  | 500                                     | 35.23                      | 50                        | 27.95                      | 100                       | 29.04                      | 0.400                 | 0.34                              | 0.46  |
|          |                   |                    | 0.0234                | 19.0                             | 91                               | 691                                  | 500                                     | 34.04                      | 50                        | 27.00                      | 100                       | 28.06                      | 0.400                 | 0.34                              | 0.46  |
| 500      | No. 35            | 560                | 0.0220                | 17.9                             | 87                               | 647                                  | 500                                     | 32.43                      | 50                        | 25.73                      | 100                       | 26.73                      | 0.355                 | 0.30                              | 0.41  |
|          |                   |                    | 0.0197                | 16.2                             | 80                               | 580                                  | 600                                     | 29.96                      | 60                        | 24.21                      | 120                       | 25.09                      | 0.315                 | 0.27                              | 0.36  |
| 425      | No. 40            | 450                | 0.0177                | 14.7                             | 75                               | 525                                  | 600                                     | 27.86                      | 60                        | 22.51                      | 120                       | 23.32                      | 0.280                 | 0.24                              | 0.32  |
|          |                   |                    | 0.0165                | 14.0                             | 73                               | 498                                  | 600                                     | 26.79                      | 60                        | 21.65                      | 120                       | 22.43                      | 0.280                 | 0.24                              | 0.32  |
| 355      | No. 45            | 400                | 0.0157                | 13.3                             | 70                               | 470                                  | 600                                     | 25.71                      | 60                        | 20.78                      | 120                       | 21.52                      | 0.250                 | 0.21                              | 0.29  |
|          |                   |                    | 0.0139                | 12.0                             | 65                               | 420                                  | 800                                     | 23.72                      | 80                        | 19.68                      | 160                       | 20.30                      | 0.224                 | 0.19                              | 0.26  |
| 300      | No. 50            | 315                | 0.0124                | 10.8                             | 60                               | 375                                  | 800                                     | 21.90                      | 80                        | 18.17                      | 160                       | 18.75                      | 0.200                 | 0.17                              | 0.23  |
|          |                   |                    | 0.0117                | 10.4                             | 58                               | 358                                  | 800                                     | 21.20                      | 80                        | 17.59                      | 160                       | 18.15                      | 0.200                 | 0.17                              | 0.23  |
| 250      | No. 60            | 280                | 0.0110                | 9.8                              | 56                               | 336                                  | 800                                     | 20.26                      | 80                        | 16.81                      | 160                       | 17.34                      | 0.180                 | 0.15                              | 0.21  |
|          |                   |                    | 0.0098                | 8.9                              | 52                               | 302                                  | 800                                     | 18.82                      | 80                        | 15.61                      | 160                       | 16.11                      | 0.160                 | 0.13                              | 0.19  |
| 212      | No. 70            | 224                | 0.0088                | 8.1                              | 49                               | 273                                  | 800                                     | 17.53                      | 80                        | 14.54                      | 160                       | 15.01                      | 0.160                 | 0.13                              | 0.19  |
|          |                   |                    | 0.0083                | 7.8                              | 47                               | 259                                  | 800                                     | 16.93                      | 80                        | 14.05                      | 160                       | 14.49                      | 0.140                 | 0.12                              | 0.17  |
| 180      | No. 80            | 200                | 0.0079                | 7.4                              | 45                               | 245                                  | 800                                     | 16.32                      | 80                        | 13.54                      | 160                       | 13.97                      | 0.140                 | 0.12                              | 0.17  |
|          |                   |                    | 0.0070                | 6.8                              | 43                               | 223                                  | 1000                                    | 15.27                      | 100                       | 12.91                      | 200                       | 13.28                      | 0.125                 | 0.106                             | 0.150 |
| 150      | No. 100           | 160                | 0.0063                | 6.3                              | 40                               | 200                                  | 1000                                    | 14.20                      | 100                       | 12.00                      | 200                       | 12.34                      | 0.112                 | 0.095                             | 0.130 |
|          |                   |                    | 0.0059                | 6.0                              | 38                               | 188                                  | 1000                                    | 13.65                      | 100                       | 11.53                      | 200                       | 11.86                      | 0.100                 | 0.085                             | 0.115 |
| 125      | No. 120           | 140                | 0.0055                | 5.7                              | 37                               | 177                                  | 1000                                    | 13.09                      | 100                       | 11.06                      | 200                       | 11.38                      | 0.100                 | 0.085                             | 0.115 |
|          |                   |                    | 0.0049                | 5.2                              | 34                               | 159                                  | 1000                                    | 12.23                      | 100                       | 10.33                      | 200                       | 10.63                      | 0.090                 | 0.077                             | 0.104 |
| 106      | No. 140           | 112                | 0.0044                | 4.8                              | 32                               | 144                                  | 1000                                    | 11.46                      | 100                       | 9.68                       | 200                       | 9.96                       | 0.080                 | 0.068                             | 0.092 |
|          |                   |                    | 0.0041                | 4.7                              | 31                               | 137                                  | 1000                                    | 11.10                      | 100                       | 9.38                       | 200                       | 9.65                       | 0.071                 | 0.060                             | 0.082 |
| 90       | No. 170           | 100                | 0.0039                | 4.5                              | 30                               | 130                                  | 1000                                    | 10.73                      | 100                       | 9.07                       | 200                       | 9.33                       | 0.071                 | 0.060                             | 0.082 |
|          |                   |                    | 0.0035                | 4.2                              | 29                               | 119                                  | 1000                                    | 10.10                      | 100                       | 8.53                       | 200                       | 8.78                       | 0.063                 | 0.054                             | 0.072 |
| 75       | No. 200           | 80                 | 0.0031                | 3.9                              | 27                               | 107                                  | 1000                                    | 9.45                       | 100                       | 7.99                       | 250                       | 8.33                       | 0.056                 | 0.048                             | 0.064 |
|          |                   |                    | 0.0029                | 3.7                              | 26                               | 101                                  | 1000                                    | 9.12                       | 100                       | 7.70                       | 250                       | 8.04                       | 0.050                 | 0.043                             | 0.058 |
| 63       | No. 230           | 71                 | 0.0028                | 3.6                              | 25                               | 96                                   | 1000                                    | 8.85                       | 100                       | 7.48                       | 250                       | 7.80                       | 0.050                 | 0.043                             | 0.058 |
|          |                   |                    | 0.0025                | 3.4                              | 24                               | 87                                   | 1000                                    | 8.29                       | 100                       | 7.01                       | 250                       | 7.31                       | 0.045                 | 0.038                             | 0.052 |
| 53       | No. 270           | 56                 | 0.0022                | 3.2                              | 22                               | 78                                   | 1000                                    | 7.79                       | 100                       | 6.58                       | 250                       | 6.87                       | 0.040                 | 0.034                             | 0.046 |
|          |                   |                    | 0.0021                | 3.1                              | 21                               | 74                                   | 1000                                    | 7.56                       | 100                       | 6.39                       | 250                       | 6.67                       | 0.036                 | 0.031                             | 0.041 |
| 45       | No. 325           | 50                 | 0.0020                | 3.0                              | 21                               | 71                                   | 1000                                    | 7.34                       | 100                       | 6.20                       | 250                       | 6.47                       | 0.036                 | 0.031                             | 0.041 |
|          |                   |                    | 0.0017                | 2.8                              | 20                               | 65                                   | 1000                                    | 6.95                       | 100                       | 5.87                       | 250                       | 6.13                       | 0.032                 | 0.027                             | 0.037 |
| 38       | No. 400           | 40                 | 0.0016                | 2.7                              | 19                               | 59                                   | 1000                                    | 6.55                       | 100                       | 5.54                       | 300                       | 5.83                       | 0.032                 | 0.027                             | 0.037 |
|          |                   |                    | 0.0015                | 2.6                              | 18                               | 56                                   | 1000                                    | 6.38                       | 100                       | 5.39                       | 300                       | 5.69                       | 0.030                 | 0.024                             | 0.035 |
| 32       | No. 450           | 36                 | 0.0014                | 2.6                              | 18                               | 54                                   | 1000                                    | 6.22                       | 100                       | 5.26                       | 300                       | 5.54                       | 0.030                 | 0.024                             | 0.035 |
| 25       | No. 500           |                    | 0.0012                | 2.4                              | 17                               | 49                                   | 1000                                    | 5.87                       | 100                       | 4.96                       | 300                       | 5.23                       | 0.028                 | 0.023                             | 0.033 |
|          |                   |                    | 0.0010                | 2.2                              | 15                               | 40                                   | 1000                                    | 5.23                       | 100                       | 4.42                       | 300                       | 4.66                       | 0.025                 | 0.021                             | 0.029 |
| 20       | No. 635           |                    | 0.0008                | 2.1                              | 13                               | 33                                   | 1000                                    | 4.73                       | 100                       | 4.00                       | 300                       | 4.22                       | 0.020                 | 0.017                             | 0.023 |

Column 3—These numbers are only approximate but are in use for reference; the sieve shall be identified by the standard designation in millimetres or micrometres.

Columns 9 and 11—See Annex A1, which specifies that all openings will be inspected for test sieves having 15 openings or less.

Columns 9 and 11—These number of sample openings are based on an 8-in. diameter test sieve.

3.1.3 *crimp, n*—the corrugation in the warp and shute wire, or both. The crimp in the wires is formed either during the weaving process, or with a crimping machine prior to weaving. If formed during the weaving process, the tension existing between the warp and shute wires fundamentally determines the respective amount or depth of crimp, which locks the wires in place, and in part establishes the firmness of the sieve cloth.

3.1.4 *firmness, n*—a subjective term referring to the planar rigidity of sieve cloth (as a roll good, not mounted in a test sieve frame), established by the tensile strength of the material, the relationship of the mesh to wire diameters, the type of weave, and amount of crimp in the wires. The absence of firmness in sieve cloth is termed *sleaziness*.

3.1.5 *matched test sieve, n*—a test sieve that reproduces the performance results of another test sieve within user defined limits for a designated material (for information only and may not be in compliance with this specification).

3.1.6 *mesh, n*—the number of wires or openings per linear inch (25.4 mm) counted from the center of any wire to a point exactly 1 in. (25.4 mm) distant, including the fractional distance between either thereof.

3.1.7 *plain weave, n*—sieve cloth in which the warp wires and shute wires pass over one and under one in both directions.

3.1.8 *shute wires, n*—the wires running the short way of, or across the cloth as woven (also referred to as the shoot, fill, or weft wires).

3.1.9 *sieve, n*—an apparatus for the purpose of sieving, consisting of a separating media mounted in a frame.

3.1.10 *sieve cloth, n*—woven wire cloth conforming to this specification.

3.1.11 *test sieve (wire cloth), n*—a sieve manufactured by mounting sieve cloth in a frame, designed for use in particle size analysis by sieving.

3.1.11.1 *compliance test sieve, n*—a test sieve manufactured using sieve cloth which has been inspected prior to being mounted in the sieve frame; and that meets the requirements of Table 1 in part based on the standard deviation of the required number of sample openings per 100 square feet of sieve cloth (Column 7) not exceeding the maximum allowable for a confidence level of 66 % (Column 8).

3.1.11.2 *inspection test sieve, n*—a test sieve manufactured using sieve cloth which has been inspected after being mounted in the sieve frame; and that meets the requirements of Table 1 in part based on the standard deviation of the required number of sample openings in the test sieve (Column 9) not exceeding the maximum allowable for a confidence level of 99 % (Column 10).

3.1.11.3 *calibration test sieve, n*—a test sieve manufactured using sieve cloth which has been inspected after being mounted in the sieve frame; and that meets the requirements of Table 1 in part based on the standard deviation of the required number of sample openings in the test sieve (Column 11) not exceeding the maximum allowable for a confidence level of 99.73 % (Column 12).

3.1.11.3.1 *Discussion*—Calibration sieves have had at least twice as many openings measured as Inspection sieves.

3.1.12 *twill weave, n*—sieve cloth in which the warp wires and shute wires pass over two and under two wires in both directions.

3.1.13 *warp wires, n*—the wires running the long way of the cloth as woven.

## 4. Ordering Information

4.1 Orders for items under this specification should include the following information as required:

4.1.1 Description of item(s) (Test Sieve or Sieve Cloth),

4.1.2 ASTM E11 designation and year of issue,

4.1.3 Quantity of each item, and

4.1.4 Sieve designation (Table 1, Standard Column 1, Alternate Column 2).

4.1.4.1 Test sieves can be supplied based on different levels of confidence as Compliance Sieves, Inspection Sieves, and Calibration Sieves.

4.2 Test sieves in standard circular or nonstandard frame:

4.2.1 Nominal sieve frame diameter (see Table 2), and

4.2.2 Nominal sieve frame height (see Table 2).

4.3 Description of nonstandard sieve.

## 5. Sieve Cloth Requirements

5.1 The sieve cloth used in test sieves shall meet the requirements of Table 1 and shall be designated Specification E11 Sieve Cloth. The number of inspected apertures shall be in accordance with Table 1 (Column 7). Sieve cloth conforming to this specification shall be woven from stainless steel, brass, or bronze. Sieve cloth with openings greater than or equal to 75 micrometres shall be woven using a plain weave. For sieve cloth with openings equal to or less than 71 micrometres the sieve cloth may be supplied using a twill weave. The sieve cloth shall not be coated or plated.

5.2 All measurements of openings and wire diameters shall be made along the midpoints of the openings as shown in Fig. 1.

TABLE 2 Dimensions of Standard Frames

| Nominal Diameter, in. | Diameter Tolerance, in. (mm)                      | Typical Frame <sup>A</sup>                  |
|-----------------------|---------------------------------------------------|---------------------------------------------|
|                       | Inside at Top <sup>B</sup>                        | Nominal Height, in. (mm)                    |
| 3                     | 3.000 + 0.030 / -0.000<br>(76.2 + 0.76 / -0.00)   | 1¼ (31.8) FH <sup>C</sup><br>⅝ (15.9) HH    |
| 6                     | 6.000 + 0.030 / -0.000<br>(152.4 + 0.76 / -0.00)  | 1¾ (44.5) FH<br>1 (25.4) HH                 |
| 8                     | 8.000 + 0.030 / -0.000<br>(203.2 + 0.76 / -0.00)  | 2 (50.8) FH<br>1 (25.4) HH                  |
| 10                    | 10.000 + 0.030 / -0.000<br>(254 + 0.76 / -0.00)   | 3 (76.2) FH<br>1½ (38.1) HH                 |
| 12                    | 12.000 + 0.030 / -0.000<br>(304.8 + 0.76 / -0.00) | 3¼ (82.6) FH<br>2 (50.8) IH<br>1⅝ (41.3) HH |

<sup>A</sup> Frame height measured from top of frame to top of sieve cloth.

<sup>B</sup> Measured 0.2 in. (5 mm) below the top of the frame.

<sup>C</sup> FH = full height; HH = half height; IH = intermediate height.