



# Standard Specification for Industrial Perforated Plate and Screens (Round Opening Series)<sup>1</sup>

This standard is issued under the fixed designation E674; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

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

## INTRODUCTION

Industrial perforated plate can be produced in many thousands of combinations of size and shape of opening, bar size, thickness of material, and type of metal. Such variety is often confusing and, to the vast majority of perforated plate users, unnecessary, since each usually requires only a very few specifications.

The purpose of this specification is to simplify this problem by a condensed table of recommended specifications covering a wide range of openings in which industrial perforated plate is made, with several recommended bar sizes and thicknesses of plate for each opening, for use in various grades of service.

By making selections from this specification, the user will be guided to specifications that are being regularly produced, thus avoiding inadvertent selection of specifications that, because of little or no demand, are unobtainable, except on special order (usually quite expensive unless the quantity ordered is sufficient to justify the cost of special tooling).

If a user has a specific application for industrial perforated plate that can not be solved by a selection from this specification, it is recommended that he consult his perforated plate supplier on the availability of an acceptable alternative specification.

## 1. Scope

1.1 This specification covers the sizes of round opening perforated plate and screens for general industrial uses, including the separating or grading of materials according to designated nominal particle size, and lists standards for openings from 5 in. (125 mm) to 0.020 in. (500  $\mu$ m) punched with bar sizes and thicknesses of plate for various grades of service. Methods of checking industrial perforated plate and screens are included as information in **Appendix X3**.

1.2 This specification does not apply to perforated plate or screens with square, hexagon, slotted, or other shaped openings.

1.3 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.

1.4 *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*:<sup>2</sup>

**E323** Specification for Perforated-Plate Sieves for Testing Purposes

**E1638** Terminology Relating to Sieves, Sieving Methods, and Screening Media

2.2 *ISO Standards*:<sup>3</sup>

**ISO 2194-1972** Wire Screens and Plate Screens for Industrial Purposes—Nominal Sizes of Apertures.

<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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<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 International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, Case postale 56, CH-1211, Geneva 20, Switzerland, <http://www.iso.ch>.

ISO Recommendation R388-1964 Metric Series for Basic Thicknesses of Sheet and Diameters of Wire.

2.3 Other Documents:

Fed. Std. 123 Marking for Shipments (Civil Agencies)<sup>4</sup>

Mil-Std-129 Marking for Shipment and Storage<sup>4</sup>

### 3. Terminology

3.1 Definitions—For definitions of related terms, refer to Terminology E1638.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *bar, n*—metal between perforations measured at the point where perforations are the closest.

3.2.2 *blank, n*—unperforated area located other than along the perimeter of a plate.

3.2.3 *break-out, n*—term applied to the action that occurs ahead of the punch in its going through the plate.

3.2.3.1 Discussion—The fracturing of the material results in a tapered hole with the small dimensions on the punch side.

3.2.4 *centers, n*—dimensional sum of one perforation and one bar or the dimensional distance from the center of one perforation to the center of an adjacent perforation.

3.2.5 *die side, n*—surface of the plate that was against the die during the punching operation.

3.2.6 *finished end pattern, n*—condition that occurs with some specifications of staggered pattern perforations as a result of tool design in which the pattern is completed on both ends of the plate (Fig. 1).

3.2.7 *margin or border, n*—unperforated area located along the perimeter of a plate.

3.2.8 *perforation, n*—aperture or opening produced by punching.

3.2.9 *screen, n*—(1) surface provided with openings of uniform size; or (2) machine provided with one or more screen surfaces.

3.2.10 *screening, v*—process of separating a mixture of different sizes by means of one or more screen surfaces.

3.2.11 *smooth side or punch side, n*—surface of the plate that was uppermost during the punching operation and through which the punch entered the plate.

3.2.12 *unfinished end pattern, n*—condition that occurs with some specifications of staggered pattern perforations as a result of tool design.

3.2.12.1 Discussion—On one end of the plate, the pattern will appear to be incomplete as a result of unperforated holes in the even numbered rows, while on the other end of the same plate, the pattern will appear to be incomplete because of unperforated holes in the odd numbered rows (Fig. 2).

### 4. Standard Specifications

4.1 Standard specifications for industrial perforated plate and screens are listed in Table 1.

4.2 Openings—The series of standard openings listed in Table 1 include those of the USA Standard Sieve Series, Specification E323, and those of the ISO apertures for industrial plate screens, ISO 2194-1972, with the addition of those openings in common usage.

4.3 Relationship of Grades—The purpose of the several grades is to provide combinations of opening and bar size for various types of service, from medium-light to heavy. Since it is possible to vary the bar size independently from the plate thickness, each of the service grades lists up to three combinations of bar and gage for each opening. The entire standard series has been designed for a logical relationship of bar size to opening in each grade and between grades with the capability of also being able to vary the plate thickness.

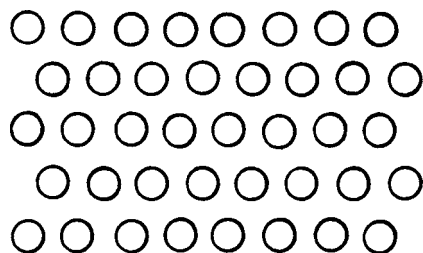


FIG. 1 Finished End Pattern

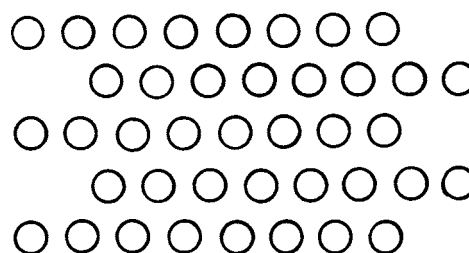


FIG. 2 Unfinished End Pattern

TABLE 1 USA Standard Specifications for Industrial Perforated Plate and Screens (Round Opening Series)—(U.S. Customary Units)

| Perforated Opening |            | Medium Light |      |        |       | Medium |      |        |       | Medium Heavy |      |        |       | Heavy |       |        |       |
|--------------------|------------|--------------|------|--------|-------|--------|------|--------|-------|--------------|------|--------|-------|-------|-------|--------|-------|
| Standard           | USA        | Open-        | Bar, | Gage-  | Open  | Open-  | Bar, | Gage-  | Open  | Open-        | Bar, | Gage-  | Open  | Open- | Bar,  | Gage-  | Open  |
| (metric),          | Industrial | ing,         | in.  | Steel, | Area, | ing,   | in.  | Steel, | Area, | ing,         | in.  | Steel, | Area, | ing,  | in.   | Steel, | Area, |
| mm                 | Standard,  | in.          |      | in.    | %     | in.    |      | in.    | %     | in.          |      | in.    | %     | in.   |       | in.    | %     |
| 125                | 5          | 5            | 1/2  | 1/2    | 74.9  | 5      | 5/8  | 5/8    | 71.6  | 5            | 3/4  | 3/4    | 68.5  | 5     | 1     | 1      | 62.9  |
| 125                | 5          | 5            | 5/8  | 3/8    | 71.6  | 5      | 3/4  | 1/2    | 68.5  | 5            | 7/8  | 5/8    | 65.6  | 5     | 1 1/8 | 7/8    | 60.4  |
| 125                | 5          | 5            | 5/8  | 1/2    | 71.6  | 5      | 3/4  | 5/8    | 68.5  | 5            | 7/8  | 3/4    | 65.6  | 5     | 1 1/8 | 1      | 60.4  |
| ...                | ...        | 4 1/2        | 1/2  | 1/2    | 73.4  | 4 1/2  | 5/8  | 5/8    | 69.9  | 4 1/2        | 3/4  | 3/4    | 66.6  | 4 1/2 | 1     | 1      | 60.7  |

**TABLE 1** *Continued*

| Perforated Opening    |                              | Medium Light |                 |                 |              | Medium       |                 |                 |              | Medium Heavy |          |                 |              | Heavy        |          |                 |              |
|-----------------------|------------------------------|--------------|-----------------|-----------------|--------------|--------------|-----------------|-----------------|--------------|--------------|----------|-----------------|--------------|--------------|----------|-----------------|--------------|
| Standard (metric), mm | USA Industrial Standard, in. | Opening, in. | Bar, in.        | Gage-Steel, in. | Open Area, % | Opening, in. | Bar, in.        | Gage-Steel, in. | Open Area, % | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % |
| ...                   | ...                          | 4½           | ⅝               | ⅜               | 69.9         | 4½           | ¾               | ½               | 66.6         | 4½           | ⅞        | ⅝               | 63.5         | 4½           | 1⅛       | ⅞               | 58           |
| ...                   | ...                          | 4½           | ⅝               | ½               | 69.9         | 4½           | ¾               | ⅝               | 66.6         | 4½           | ⅞        | ¾               | 63.5         | 4½           | 1⅛       | 1               | 58           |
| 106                   | 4¼                           | 4¼           | ½               | ½               | 72.6         | 4¼           | ⅝               | ⅝               | 68.9         | 4¼           | ¾        | ¾               | 65.5         | 4¼           | 1        | 1               | 59.4         |
| 106                   | 4¼                           | 4¼           | ⅝               | ⅜               | 68.9         | 4¼           | ¾               | ½               | 65.5         | 4¼           | ⅞        | ⅝               | 62.3         | 4¼           | 1⅛       | ⅞               | 56.7         |
| 106                   | 4¼                           | 4¼           | ⅝               | ½               | 68.9         | 4¼           | ¾               | ⅝               | 65.5         | 4¼           | ⅞        | ¾               | 62.3         | 4¼           | 1⅛       | 1               | 56.7         |
| 100                   | 4                            | 4            | ½               | ½               | 71.6         | 4            | ⅝               | ⅝               | 67.8         | 4            | ¾        | ¾               | 64.3         | 4            | 1        | 1               | 58           |
| 100                   | 4                            | 4            | ⅝               | ⅜               | 67.8         | 4            | ¾               | ½               | 64.3         | 4            | ⅞        | ⅝               | 61           | 4            | 1⅛       | ⅞               | 55.2         |
| 100                   | 4                            | 4            | ⅝               | ½               | 67.8         | 4            | ¾               | ⅝               | 64.3         | 4            | ⅞        | ¾               | 61           | 4            | 1⅛       | 1               | 55.2         |
| ...                   | ...                          | 3¾           | ½               | ½               | 70.6         | 3¾           | ⅝               | ⅝               | 66.6         | 3¾           | ¾        | ¾               | 62.9         | 3¾           | ⅞        | ⅞               | 59.6         |
| ...                   | ...                          | 3¾           | ⅝               | ⅜               | 66.6         | 3¾           | ¾               | ½               | 62.9         | 3¾           | ⅞        | ⅝               | 59.6         | 3¾           | 1        | ¾               | 48.9         |
| ...                   | ...                          | 3¾           | ⅝               | ½               | 66.6         | 3¾           | ¾               | ⅝               | 62.9         | 3¾           | ⅞        | ¾               | 59.6         | 3¾           | 1        | ⅞               | 48.9         |
| 90                    | 3½                           | 3½           | ½               | ½               | 69.4         | 3½           | ⅝               | ⅝               | 65.2         | 3½           | ¾        | ¾               | 61.5         | 3½           | ⅞        | ⅞               | 58           |
| 90                    | 3½                           | 3½           | ⅝               | ⅜               | 65.2         | 3½           | ¾               | ½               | 61.5         | 3½           | ⅞        | ⅝               | 58           | 3½           | 1        | ¾               | 54.8         |
| 90                    | 3½                           | 3½           | ⅝               | ½               | 65.2         | 3½           | ¾               | ⅝               | 61.5         | 3½           | ⅞        | ¾               | 58           | 3½           | 1        | ⅞               | 54.8         |
| ...                   | ...                          | 3¼           | ⅜               | ⅜               | 72.8         | 3¼           | ½               | ½               | 68.1         | 3¼           | ⅝        | ⅝               | 63.8         | 3¼           | ¾        | ¾               | 59.8         |
| ...                   | ...                          | 3¼           | ½               | ⅝ <sub>16</sub> | 68.1         | 3¼           | ⅝               | ⅜               | 63.7         | 3¼           | ¾        | ½               | 59.8         | 3¼           | ⅞        | ⅝               | 56.2         |
| ...                   | ...                          | 3¼           | ½               | ⅜               | 68.1         | 3¼           | ⅝               | ½               | 63.7         | 3¼           | ¾        | ⅝               | 59.8         | 3¼           | ⅞        | ¾               | 56.2         |
| 75                    | 3                            | 3            | ⅜               | ⅜               | 71.6         | 3            | ½               | ½               | 66.6         | 3            | ⅝        | ⅝               | 62.1         | 3            | ¾        | ¾               | 58           |
| 75                    | 3                            | 3            | ½               | ⅝ <sub>16</sub> | 66.6         | 3            | ⅝               | ⅜               | 62.1         | 3            | ¾        | ½               | 58           | 3            | ⅞        | ⅝               | 54.3         |
| 75                    | 3                            | 3            | ½               | ⅜               | 66.6         | 3            | ⅝               | ½               | 62.1         | 3            | ¾        | ⅝               | 58           | 3            | ⅞        | ¾               | 54.3         |
| ...                   | ...                          | 2¾           | ⅜               | ⅜               | 70.2         | 2¾           | ½               | ½               | 64.9         | 2¾           | ⅝        | ⅝               | 60.2         | 2¾           | ¾        | ¾               | 55.9         |
| ...                   | ...                          | 2¾           | ½               | ⅝ <sub>16</sub> | 64.9         | 2¾           | ⅝               | ⅜               | 60.2         | 2¾           | ¾        | ½               | 55.9         | 2¾           | ⅞        | ⅝               | 52.1         |
| ...                   | ...                          | 2¾           | ½               | ⅜               | 64.9         | 2¾           | ⅝               | ½               | 60.2         | 2¾           | ¾        | ⅝               | 55.9         | 2¾           | ⅞        | ¾               | 52.1         |
| 63                    | 2½                           | 2½           | ⅜               | ⅜               | 68.5         | 2½           | ½               | ½               | 62.9         | 2½           | ⅝        | ⅝               | 58           | 2½           | ¾        | ¾               | 53.6         |
| 63                    | 2½                           | 2½           | ½               | ⅝ <sub>16</sub> | 62.9         | 2½           | ⅝               | ⅜               | 58           | 2½           | ¾        | ½               | 53.6         | 2½           | ⅞        | ⅝               | 49.7         |
| 63                    | 2½                           | 2½           | ½               | ⅜               | 62.9         | 2½           | ⅝               | ½               | 58           | 2½           | ¾        | ⅝               | 53.6         | 2½           | ⅞        | ¾               | 49.7         |
| ...                   | ...                          | 2¼           | ⅜               | ⅜               | 66.6         | 2¼           | ½               | ½               | 60.7         | 2¼           | ⅝        | ⅝               | 55.5         | 2¼           | ¾        | ¾               | 51           |
| ...                   | ...                          | 2¼           | ½               | ⅝ <sub>16</sub> | 60.7         | 2¼           | ⅝               | ⅜               | 55.5         | 2¼           | ¾        | ½               | 51           | 2¼           | ⅞        | ⅝               | 47           |
| ...                   | ...                          | 2¼           | ½               | ⅜               | 60.7         | 2¼           | ⅝               | ½               | 55.5         | 2¼           | ¾        | ⅝               | 51           | 2¼           | ⅞        | ¾               | 47           |
| 53                    | 2⅛                           | 2⅛           | ⅝ <sub>16</sub> | ⅝ <sub>16</sub> | 68.9         | 2⅛           | ⅜               | ⅜               | 65.5         | 2⅛           | ½        | ½               | 59.4         | 2⅛           | ⅝        | ⅝               | 54.1         |
| 53                    | 2⅛                           | 2⅛           | ⅜               | ¼               | 65.5         | 2⅛           | ½               | ⅝ <sub>16</sub> | 59.4         | 2⅛           | ⅝        | ⅜               | 54.1         | 2⅛           | ¾        | ½               | 49.5         |
| 53                    | 2⅛                           | 2⅛           | ⅜               | ⅝ <sub>16</sub> | 65.5         | 2⅛           | ½               | ⅜               | 59.4         | 2⅛           | ⅝        | ½               | 54.1         | 2⅛           | ¾        | ⅝               | 49.5         |
| 50                    | 2                            | 2            | ⅝ <sub>16</sub> | ⅝ <sub>16</sub> | 67.8         | 2            | ⅜               | ⅜               | 64.3         | 2            | ½        | ½               | 58           | 2            | ⅝        | ⅝               | 52.6         |
| 50                    | 2                            | 2            | ⅜               | ¼               | 64.3         | 2            | ½               | ⅝ <sub>16</sub> | 58           | 2            | ⅝        | ⅜               | 52.6         | 2            | ¾        | ½               | 47.9         |
| 50                    | 2                            | 2            | ⅜               | ⅝ <sub>16</sub> | 64.3         | 2            | ½               | ⅜               | 58           | 2            | ⅝        | ½               | 52.6         | 2            | ¾        | ⅝               | 47.9         |
| ...                   | ...                          | 1⅞           | ⅝ <sub>16</sub> | ⅝ <sub>16</sub> | 66.6         | 1⅞           | ⅜               | ⅜               | 62.9         | 1⅞           | ½        | ½               | 56.5         | 1⅞           | ⅝        | ⅝               | 51           |
| ...                   | ...                          | 1⅞           | ⅜               | ¼               | 62.9         | 1⅞           | ½               | ⅝ <sub>16</sub> | 56.5         | 1⅞           | ⅝        | ⅜               | 51           | 1⅞           | ¾        | ½               | 46.2         |
| ...                   | ...                          | 1⅞           | ⅜               | ⅝ <sub>16</sub> | 62.9         | 1⅞           | ½               | ⅜               | 56.5         | 1⅞           | ⅝        | ½               | 51           | 1⅞           | ¾        | ⅝               | 46.2         |
| 45                    | 1¾                           | 1¾           | ⅝ <sub>16</sub> | ⅝ <sub>16</sub> | 65.2         | 1¾           | ⅜               | ⅜               | 61.5         | 1¾           | ½        | ½               | 54.8         | 1¾           | ⅝        | ⅝               | 49.2         |
| 45                    | 1¾                           | 1¾           | ⅜               | ¼               | 61.5         | 1¾           | ½               | ⅝ <sub>16</sub> | 54.8         | 1¾           | ⅝        | ⅜               | 49.2         | 1¾           | ¾        | ½               | 44.4         |
| 45                    | 1¾                           | 1¾           | ⅜               | ⅝ <sub>16</sub> | 61.5         | 1¾           | ½               | ⅜               | 54.8         | 1¾           | ⅝        | ½               | 49.2         | 1¾           | ¾        | ⅝               | 44.4         |
| ...                   | ...                          | 1⅝           | ¼               | ¼               | 68.1         | 1⅝           | ⅝ <sub>16</sub> | ⅝ <sub>16</sub> | 63.7         | 1⅝           | ⅜        | ⅜               | 59.8         | 1⅝           | ½        | ½               | 53           |
| ...                   | ...                          | 1⅝           | ⅝ <sub>16</sub> | ⅝ <sub>16</sub> | 63.7         | 1⅝           | ⅝               | ¼               | 59.8         | 1⅝           | ½        | ⅝ <sub>16</sub> | 53           | 1⅝           | ⅝        | ⅜               | 47.3         |
| ...                   | ...                          | 1⅝           | ⅝ <sub>16</sub> | ¼               | 63.7         | 1⅝           | ⅝               | ⅝ <sub>16</sub> | 59.8         | 1⅝           | ½        | ⅜               | 53           | 1⅝           | ⅝        | ½               | 47.3         |
| 37.5                  | 1½                           | 1½           | ¼               | ¼               | 66.6         | 1½           | ⅝ <sub>16</sub> | ⅝ <sub>16</sub> | 62.1         | 1½           | ⅜        | ⅜               | 58           | 1½           | ½        | ½               | 51           |
| 37.5                  | 1½                           | 1½           | ⅝ <sub>16</sub> | ⅝ <sub>16</sub> | 62.1         | 1½           | ⅜               | ¼               | 58           | 1½           | ½        | ⅝ <sub>16</sub> | 51           | 1½           | ⅝        | ⅜               | 45.1         |
| 37.5                  | 1½                           | 1½           | ⅝ <sub>16</sub> | ¼               | 62.1         | 1½           | ⅜               | ⅝ <sub>16</sub> | 58           | 1½           | ½        | ⅜               | 51           | 1½           | ⅝        | ½               | 45.1         |
| ...                   | ...                          | 1⅜           | ¼               | ¼               | 64.9         | 1⅜           | ⅝ <sub>16</sub> | ⅝ <sub>16</sub> | 60.2         | 1⅜           | ⅜        | ⅜               | 55.9         | 1⅜           | ½        | ½               | 48.7         |
| ...                   | ...                          | 1⅜           | ⅝ <sub>16</sub> | ⅝ <sub>16</sub> | 60.2         | 1⅜           | ⅝               | ¼               | 55.9         | 1⅜           | ½        | ⅝ <sub>16</sub> | 48.7         | 1⅜           | ⅝        | ⅜               | 42.8         |
| ...                   | ...                          | 1⅜           | ⅝ <sub>16</sub> | ¼               | 60.2         | 1⅜           | ⅝               | ⅝ <sub>16</sub> | 55.9         | 1⅜           | ½        | ⅜               | 48.7         | 1⅜           | ⅝        | ½               | 42.8         |

**TABLE 1** *Continued*

| Perforated Opening    |                              | Medium Light |          |                 |              | Medium       |          |                 |              | Medium Heavy |          |                 |              | Heavy        |          |                 |              |
|-----------------------|------------------------------|--------------|----------|-----------------|--------------|--------------|----------|-----------------|--------------|--------------|----------|-----------------|--------------|--------------|----------|-----------------|--------------|
| Standard (metric), mm | USA Industrial Standard, in. | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % |
| 31.5                  | 1¼                           | 1¼           | ¼        | ¼               | 62.9         | 1¼           | 5/16     | 5/16            | 58           | 1¼           | 3/8      | 3/8             | 53.6         | 1¼           | 1/2      | 1/2             | 46.2         |
| 31.5                  | 1¼                           | 1¼           | 5/16     | 3/16            | 58           | 1¼           | 3/8      | ¼               | 53.6         | 1¼           | 1/2      | 5/16            | 46.2         | 1¼           | 5/8      | 3/8             | 40.3         |
| 31.5                  | 1¼                           | 1¼           | 5/16     | ¼               | 58           | 1¼           | 3/8      | 5/16            | 53.6         | 1¼           | 1/2      | 3/8             | 46.2         | 1¼           | 5/8      | 1/2             | 40.3         |
| ...                   | ...                          | 13/16        | 3/16     | 3/16            | 67.6         | 13/16        | ¼        | ¼               | 61.8         | 13/16        | 5/16     | 5/16            | 56.8         | 13/16        | 3/8      | 3/8             | 52.3         |
| ...                   | ...                          | 13/16        | ¼        | 8               | 61.8         | 13/16        | 5/16     | 3/16            | 56.8         | 13/16        | 3/8      | ¼               | 52.3         | 13/16        | 1/2      | 5/16            | 44.9         |
| ...                   | ...                          | 13/16        | ¼        | 3/16            | 61.8         | 13/16        | 5/16     | ¼               | 56.8         | 13/16        | 3/8      | 5/16            | 52.3         | 13/16        | 1/2      | 3/8             | 44.9         |
| ...                   | ...                          | 11/8         | 3/16     | 3/16            | 66.6         | 11/8         | ¼        | ¼               | 60.7         | 11/8         | 5/16     | 5/16            | 55.5         | 11/8         | 3/8      | 3/8             | 51           |
| ...                   | ...                          | 11/8         | ¼        | 8               | 60.7         | 11/8         | 5/16     | 3/16            | 55.5         | 11/8         | 3/8      | ¼               | 51           | 11/8         | 1/2      | 5/16            | 43.4         |
| ...                   | ...                          | 11/8         | ¼        | 3/16            | 60.7         | 11/8         | 5/16     | ¼               | 55.5         | 11/8         | 3/8      | 5/16            | 51           | 11/8         | 1/2      | 3/8             | 43.4         |
| 26.5                  | 11/16                        | 11/16        | 3/16     | 3/16            | 65.5         | 11/16        | ¼        | ¼               | 59.4         | 11/16        | 5/16     | 5/16            | 54.1         | 11/16        | 3/8      | 3/8             | 49.5         |
| 26.5                  | 11/16                        | 11/16        | ¼        | 8               | 59.4         | 11/16        | 5/16     | 3/16            | 54.1         | 11/16        | 3/8      | ¼               | 49.5         | 11/16        | 1/2      | 5/16            | 41.9         |
| 26.5                  | 11/16                        | 11/16        | ¼        | 3/16            | 59.4         | 11/16        | 5/16     | ¼               | 54.1         | 11/16        | 3/8      | 5/16            | 49.5         | 11/16        | 1/2      | 3/8             | 41.9         |
| 25                    | 1                            | 1            | 3/16     | 3/16            | 64.3         | 1            | ¼        | ¼               | 58           | 1            | 5/16     | 5/16            | 52.6         | 1            | 3/8      | 3/8             | 47.9         |
| 25                    | 1                            | 1            | ¼        | 8               | 58           | 1            | 5/16     | 3/16            | 52.6         | 1            | 3/8      | ¼               | 47.9         | 1            | 1/2      | 5/16            | 40.3         |
| 25                    | 1                            | 1            | ¼        | 3/16            | 58           | 1            | 5/16     | ¼               | 52.6         | 1            | 3/8      | 5/16            | 47.9         | 1            | 1/2      | 3/8             | 40.3         |
| ...                   | ...                          | 15/16        | 3/16     | 3/16            | 62.9         | 15/16        | ¼        | ¼               | 56.4         | 15/16        | 5/16     | 5/16            | 51           | 15/16        | 3/8      | 3/8             | 46.2         |
| ...                   | ...                          | 15/16        | ¼        | 8               | 56.4         | 15/16        | 5/16     | 3/16            | 51           | 15/16        | 3/8      | ¼               | 46.2         | 15/16        | 1/2      | 5/16            | 38.5         |
| ...                   | ...                          | 15/16        | ¼        | 3/16            | 56.4         | 15/16        | 5/16     | ¼               | 51           | 15/16        | 3/8      | 5/16            | 46.2         | 15/16        | 1/2      | 3/8             | 38.5         |
| 22.4                  | 7/8                          | 7/8          | 3/16     | 3/16            | 61.5         | 7/8          | ¼        | ¼               | 54.8         | 7/8          | 5/16     | 5/16            | 49.2         | 7/8          | 3/8      | 3/8             | 44.4         |
| 22.4                  | 7/8                          | 7/8          | ¼        | 8               | 54.8         | 7/8          | 5/16     | 3/16            | 49.2         | 7/8          | 3/8      | ¼               | 44.4         | 7/8          | 1/2      | 5/16            | 36.7         |
| 22.4                  | 7/8                          | 7/8          | ¼        | 3/16            | 54.8         | 7/8          | 5/16     | ¼               | 49.2         | 7/8          | 3/8      | 5/16            | 44.4         | 7/8          | 1/2      | 3/8             | 36.7         |
| ...                   | ...                          | 13/16        | 3/16     | 3/16            | 59.8         | 13/16        | ¼        | ¼               | 53           | 13/16        | 5/16     | 5/16            | 47.2         | 13/16        | 3/8      | 3/8             | 42.4         |
| ...                   | ...                          | 13/16        | ¼        | 8               | 53           | 13/16        | 5/16     | 3/16            | 47.2         | 13/16        | 3/8      | ¼               | 42.4         | 13/16        | 1/2      | 5/16            | 34.7         |
| ...                   | ...                          | 13/16        | ¼        | 3/16            | 53           | 13/16        | 5/16     | ¼               | 47.2         | 13/16        | 3/8      | 5/16            | 42.4         | 13/16        | 1/2      | 3/8             | 34.7         |
| 19                    | ¾                            | ¾            | 3/16     | 3/16            | 58           | ¾            | ¼        | ¼               | 51           | ¾            | 5/16     | 5/16            | 45.1         | ¾            | 3/8      | 3/8             | 40.3         |
| 19                    | ¾                            | ¾            | ¼        | 8               | 51           | ¾            | 5/16     | 3/16            | 45.1         | ¾            | 3/8      | ¼               | 40.3         | ¾            | 1/2      | 5/16            | 32.6         |
| 19                    | ¾                            | ¾            | ¼        | 3/16            | 51           | ¾            | 5/16     | ¼               | 45.1         | ¾            | 3/8      | 5/16            | 40.3         | ¾            | 1/2      | 3/8             | 32.6         |
| ...                   | ...                          | 11/16        | 3/16     | 3/16            | 55.9         | 11/16        | ¼        | ¼               | 48.7         | 11/16        | 5/16     | 5/16            | 42.8         | 11/16        | 3/8      | 3/8             | 37.9         |
| ...                   | ...                          | 11/16        | ¼        | 8               | 48.7         | 11/16        | 5/16     | 3/16            | 42.8         | 11/16        | 3/8      | ¼               | 37.9         | 11/16        | 1/2      | 5/16            | 30.3         |
| ...                   | ...                          | 11/16        | ¼        | 3/16            | 48.7         | 11/16        | 5/16     | ¼               | 42.8         | 11/16        | 3/8      | 5/16            | 37.9         | 11/16        | 1/2      | 3/8             | 30.3         |
| 16                    | 5/8                          | 5/8          | 5/32     | 8               | 58           | 5/8          | 3/16     | 3/16            | 53.6         | 5/8          | ¼        | ¼               | 46.2         | 5/8          | 5/16     | 5/16            | 40.3         |
| 16                    | 5/8                          | 5/8          | 3/16     | 10              | 53.6         | 5/8          | ¼        | 8               | 46.2         | 5/8          | 5/16     | 3/16            | 40.3         | 5/8          | 3/8      | ¼               | 35.4         |
| 16                    | 5/8                          | 5/8          | 3/16     | 8               | 53.6         | 5/8          | ¼        | 3/16            | 46.2         | 5/8          | 5/16     | ¼               | 40.3         | 5/8          | 3/8      | 5/16            | 35.4         |
| ...                   | ...                          | 9/16         | 5/32     | 8               | 55.5         | 9/16         | 3/16     | 3/16            | 51           | 9/16         | ¼        | ¼               | 43.4         | 9/16         | 5/16     | 5/16            | 37.4         |
| ...                   | ...                          | 9/16         | 3/16     | 10              | 51           | 9/16         | ¼        | 8               | 43.4         | 9/16         | 5/16     | 3/16            | 37.4         | 9/16         | 3/8      | ¼               | 32.6         |
| ...                   | ...                          | 9/16         | 3/16     | 8               | 51           | 9/16         | ¼        | 3/16            | 43.4         | 9/16         | 5/16     | ¼               | 37.4         | 9/16         | 3/8      | 5/16            | 32.6         |
| 13.2                  | 17/32                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 17/32        | 5/32     | 3/16            | 54.1         | 17/32        | 7/32     | ¼               | 45.4         |
| 13.2                  | 17/32                        | ...          | ...      | ...             | ...          | 17/32        | 5/32     | 10              | 54.1         | 17/32        | 7/32     | 8               | 45.4         | 17/32        | 11/32    | 3/16            | 33.4         |
| 13.2                  | 17/32                        | ...          | ...      | ...             | ...          | 17/32        | 5/32     | 8               | 54.1         | 17/32        | 7/32     | 3/16            | 45.4         | 17/32        | 11/32    | ¼               | 33.4         |
| 12.5                  | 1/2                          | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 1/2          | 3/16     | 3/16            | 47.9         | 1/2          | ¼        | ¼               | 40.3         |
| 12.5                  | 1/2                          | ...          | ...      | ...             | ...          | 1/2          | 3/16     | 10              | 47.9         | 1/2          | ¼        | 8               | 40.3         | 1/2          | 5/16     | 3/16            | 34.3         |
| 12.5                  | 1/2                          | ...          | ...      | ...             | ...          | 1/2          | 3/16     | 8               | 47.9         | 1/2          | ¼        | 3/16            | 40.3         | 1/2          | 5/16     | ¼               | 34.3         |
| ...                   | ...                          | ...          | ...      | ...             | ...          | 15/32        | 1/8      | 8               | 56.5         | 15/32        | 5/32     | 3/16            | 50.9         | 15/32        | 7/32     | ¼               | 42.1         |
| ...                   | ...                          | 15/32        | 1/8      | 11              | 56.5         | 15/32        | 5/32     | 10              | 50.9         | 15/32        | 7/32     | 8               | 42.1         | 15/32        | 9/32     | 3/16            | 35.4         |
| ...                   | ...                          | 15/32        | 1/8      | 10              | 56.5         | 15/32        | 5/32     | 8               | 50.9         | 15/32        | 7/32     | 3/16            | 42.1         | 15/32        | 9/32     | ¼               | 35.4         |
| 11.2                  | 7/16                         | 7/16         | 5/32     | 10              | 49.2         | 7/16         | 3/16     | 8               | 44.4         | 7/16         | ¼        | 3/16            | 36.7         | 7/16         | 5/16     | ¼               | 30.8         |
| 11.2                  | 7/16                         | 7/16         | 3/16     | 11              | 44.4         | 7/16         | ¼        | 10              | 36.7         | 7/16         | 5/16     | 8               | 30.8         | 7/16         | 7/16     | 3/16            | 22.6         |
| 11.2                  | 7/16                         | 7/16         | 3/16     | 10              | 44.4         | 7/16         | ¼        | 8               | 36.7         | 7/16         | 5/16     | 3/16            | 30.8         | 7/16         | 7/16     | ¼               | 22.6         |
| 9.5                   | 3/8                          | 3/8          | 1/8      | 11              | 51           | 3/8          | 3/16     | 10              | 40.3         | 3/8          | 7/32     | 8               | 36.1         | 3/8          | ¼        | 3/16            | 32.6         |
| 9.5                   | 3/8                          | 3/8          | 3/16     | 12              | 40.3         | 3/8          | 7/32     | 11              | 36.1         | 3/8          | ¼        | 10              | 32.6         | 3/8          | 3/8      | 8               | 22.6         |
| 9.5                   | 3/8                          | 3/8          | 3/16     | 11              | 40.3         | 3/8          | 7/32     | 10              | 36.1         | 3/8          | ¼        | 8               | 32.6         | 3/8          | 3/8      | 3/16            | 22.6         |

**TABLE 1** *Continued*

| Perforated Opening    |                              | Medium Light |          |                 |              | Medium       |          |                 |              | Medium Heavy |          |                 |              | Heavy        |          |                 |              |
|-----------------------|------------------------------|--------------|----------|-----------------|--------------|--------------|----------|-----------------|--------------|--------------|----------|-----------------|--------------|--------------|----------|-----------------|--------------|
| Standard (metric), mm | USA Industrial Standard, in. | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % |
| 8                     | 5/16                         | 5/16         | 3/32     | 11              | 53.6         | 5/16         | 1/8      | 10              | 46.2         | 5/16         | 5/32     | 8               | 40.3         | 5/16         | 3/16     | 3/16            | 35.4         |
| 8                     | 5/16                         | 5/16         | 1/8      | 12              | 46.2         | 5/16         | 5/32     | 11              | 40.3         | 5/16         | 3/16     | 10              | 35.4         | 5/16         | 1/4      | 8               | 27.9         |
| 8                     | 5/16                         | 5/16         | 1/8      | 11              | 46.2         | 5/16         | 5/32     | 10              | 40.3         | 5/16         | 3/16     | 8               | 35.4         | 5/16         | 1/4      | 3/16            | 27.9         |
| 6.7                   | 17/64                        | ...          | ...      | ...             | ...          | 17/64        | 7/64     | 11              | 45.4         | 17/64        | 1/8      | 10              | 41.9         | 17/64        | 9/64     | 8               | 38.7         |
| 6.7                   | 17/64                        | 17/64        | 7/64     | 14              | 45.4         | 17/64        | 1/8      | 12              | 41.9         | 17/64        | 9/64     | 11              | 38.7         | 17/64        | 11/64    | 10              | 33.4         |
| 6.7                   | 17/64                        | 17/64        | 7/64     | 12              | 45.4         | 17/64        | 1/8      | 11              | 41.9         | 17/64        | 9/64     | 10              | 38.7         | 17/64        | 11/64    | 8               | 33.4         |
| 6.3                   | 1/4                          | 1/4          | 1/16     | 16              | 58           | 1/4          | 1/8      | 11              | 40.3         | 1/4          | 5/32     | 10              | 34.3         | 1/4          | 3/16     | 8               | 29.6         |
| 6.3                   | 1/4                          | 1/4          | 1/8      | 14              | 40.3         | 1/4          | 5/32     | 12              | 34.3         | 1/4          | 3/16     | 11              | 29.6         | 1/4          | 1/4      | 10              | 22.6         |
| 6.3                   | 1/4                          | 1/4          | 1/8      | 12              | 40.3         | 1/4          | 5/32     | 11              | 34.3         | 1/4          | 3/16     | 10              | 29.6         | 1/4          | 1/4      | 8               | 22.6         |
| 5.6                   | 7/32                         | 7/32         | 3/32     | 14              | 44.4         | 7/32         | 1/8      | 12              | 36.7         | 7/32         | 5/32     | 11              | 30.8         | 7/32         | 3/16     | 10              | 26.2         |
| 5.6                   | 7/32                         | 7/32         | 1/8      | 16              | 36.7         | 7/32         | 5/32     | 14              | 30.8         | 7/32         | 3/16     | 12              | 26.2         | 7/32         | 7/32     | 11              | 22.6         |
| 5.6                   | 7/32                         | 7/32         | 1/8      | 14              | 36.7         | 7/32         | 5/32     | 12              | 30.8         | 7/32         | 3/16     | 11              | 26.2         | 7/32         | 7/32     | 10              | 22.6         |
| 4.75                  | 3/16                         | 3/16         | 1/16     | 14              | 51           | 3/16         | 3/32     | 12              | 40.3         | 3/16         | 7/64     | 11              | 36.1         | 3/16         | 1/8      | 10              | 32.6         |
| 4.75                  | 3/16                         | 3/16         | 3/32     | 16              | 40.3         | 3/16         | 7/64     | 14              | 36.1         | 3/16         | 1/8      | 12              | 32.6         | 3/16         | 3/16     | 11              | 22.6         |
| 4.75                  | 3/16                         | 3/16         | 3/32     | 14              | 40.3         | 3/16         | 7/64     | 12              | 36.1         | 3/16         | 1/8      | 11              | 32.6         | 3/16         | 3/16     | 10              | 22.6         |
| 4                     | 5/32                         | ...          | ...      | ...             | ...          | 5/32         | 1/16     | 14              | 46.2         | 5/32         | 3/32     | 12              | 35.4         | 5/32         | 1/8      | 11              | 27.9         |
| 4                     | 5/32                         | 5/32         | 1/16     | 18              | 46.2         | 5/32         | 3/32     | 16              | 35.4         | 5/32         | 1/8      | 14              | 27.9         | 5/32         | 5/32     | 12              | 22.6         |
| 4                     | 5/32                         | 5/32         | 1/16     | 16              | 46.2         | 5/32         | 3/32     | 14              | 35.4         | 5/32         | 1/8      | 12              | 27.9         | 5/32         | 5/32     | 11              | 22.6         |
| 3.35                  | 1/8                          | ...          | ...      | ...             | ...          | 1/8          | 3/64     | 14              | 47.9         | 1/8          | 1/16     | 12              | 40.3         | 1/8          | 3/32     | 11              | 29.6         |
| 3.35                  | 1/8                          | 1/8          | 3/64     | 18              | 47.9         | 1/8          | 1/16     | 16              | 40.3         | 1/8          | 3/32     | 14              | 29.6         | 1/8          | 1/8      | 12              | 22.6         |
| 3.35                  | 1/8                          | 1/8          | 3/64     | 16              | 47.9         | 1/8          | 1/16     | 14              | 40.3         | 1/8          | 3/32     | 12              | 29.6         | 1/8          | 1/8      | 11              | 22.6         |
| 2.80                  | 7/64                         | ...          | ...      | ...             | ...          | 7/64         | 1/16     | 16              | 36.4         | 7/64         | 3/32     | 14              | 26.1         | 7/64         | 9/64     | 12              | 17.2         |
| 2.80                  | 7/64                         | 7/64         | 1/16     | 20              | 36.4         | 7/64         | 3/32     | 18              | 26.1         | 7/64         | 9/64     | 16              | 17.2         | 7/64         | 5/32     | 14              | 15.2         |
| 2.80                  | 7/64                         | 7/64         | 1/16     | 18              | 36.4         | 7/64         | 3/32     | 16              | 26.1         | 7/64         | 9/64     | 14              | 17.2         | 7/64         | 5/32     | 12              | 15.2         |
| 2.36                  | 3/32                         | ...          | ...      | ...             | ...          | 3/32         | 1/16     | 18              | 33.0         | 3/32         | 3/32     | 16              | 22.4         | 3/32         | 1/8      | 14              | 16.7         |
| 2.36                  | 3/32                         | 3/32         | 1/16     | 22              | 33.0         | 3/32         | 3/32     | 20              | 22.4         | 3/32         | 1/8      | 18              | 16.7         | 3/32         | 5/32     | 16              | 12.8         |
| 2.36                  | 3/32                         | 3/32         | 1/16     | 20              | 33.0         | 3/32         | 3/32     | 18              | 22.4         | 3/32         | 1/8      | 16              | 16.7         | 3/32         | 5/32     | 14              | 12.8         |
| 2.00                  | 0.078                        | ...          | ...      | ...             | ...          | 0.078        | 0.030    | 18              | 47.3         | 0.078        | 0.047    | 16              | 35.3         | 0.078        | 0.078    | 14              | 22.4         |
| 2.00                  | 0.078                        | 0.078        | 0.030    | 22              | 47.3         | 0.078        | 0.047    | 20              | 35.3         | 0.078        | 0.078    | 18              | 22.4         | 0.078        | 0.109    | 16              | 15.8         |
| 2.00                  | 0.078                        | 0.078        | 0.030    | 20              | 47.3         | 0.078        | 0.047    | 18              | 35.3         | 0.078        | 0.078    | 16              | 22.4         | 0.078        | 0.109    | 14              | 15.8         |
| 1.70                  | 0.066                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.066        | 0.043    | 18              | 33.2         | 0.066        | 0.059    | 16              | 25.3         |
| 1.70                  | 0.066                        | ...          | ...      | ...             | ...          | 0.066        | 0.043    | 22              | 33.2         | 0.066        | 0.059    | 20              | 25.3         | 0.066        | 0.090    | 18              | 16.2         |
| 1.70                  | 0.066                        | ...          | ...      | ...             | ...          | 0.066        | 0.043    | 20              | 33.2         | 0.066        | 0.059    | 18              | 25.3         | 0.066        | 0.090    | 16              | 16.2         |
| 1.40                  | 0.055                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.055        | 0.040    | 20              | 30.4         | 0.055        | 0.055    | 18              | 22.6         |
| 1.40                  | 0.055                        | ...          | ...      | ...             | ...          | 0.055        | 0.040    | 24              | 30.4         | 0.055        | 0.055    | 22              | 22.6         | 0.055        | 0.070    | 20              | 17.5         |
| 1.40                  | 0.055                        | ...          | ...      | ...             | ...          | 0.055        | 0.040    | 22              | 30.4         | 0.055        | 0.055    | 20              | 22.6         | 0.055        | 0.070    | 18              | 17.5         |
| 1.18                  | 0.045                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.045        | 0.021    | 22              | 42.1         | 0.045        | 0.033    | 20              | 30.2         |
| 1.18                  | 0.045                        | ...          | ...      | ...             | ...          | 0.045        | 0.021    | 26              | 42.1         | 0.045        | 0.033    | 24              | 30.2         | 0.045        | 0.045    | 22              | 22.4         |
| 1.18                  | 0.045                        | ...          | ...      | ...             | ...          | 0.045        | 0.021    | 24              | 42.1         | 0.045        | 0.033    | 22              | 30.2         | 0.045        | 0.045    | 20              | 22.4         |
| 1.00                  | 0.039                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.039        | 0.027    | 22              | 31.6         |
| 1.00                  | 0.039                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.039        | 0.027    | 26              | 31.6         | 0.039        | 0.039    | 24              | 22.4         |
| 1.00                  | 0.039                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.039        | 0.027    | 24              | 31.6         | 0.039        | 0.039    | 22              | 22.4         |
| 830                   | 0.032                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.032        | 0.032    | 24              | 22.4         |
| 830                   | 0.032                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.032        | 0.032    | 28              | 22.4         | 0.032        | 0.040    | 26              | 17.9         |
| 830                   | 0.032                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.032        | 0.032    | 26              | 22.4         | 0.032        | 0.040    | 24              | 17.9         |
| 710                   | 0.027                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.027        | 0.030    | 26              | 20.3         |
| 710                   | 0.027                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.027        | 0.030    | 30              | 20.3         | 0.027        | 0.039    | 28              | 15.2         |
| 710                   | 0.027                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.027        | 0.030    | 28              | 20.3         | 0.027        | 0.039    | 26              | 15.2         |
| 600                   | 0.023                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.023        | ...      | ...             | ...          |
| 600                   | 0.023                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.023        | 0.032    | 30              | 15.8         |

**TABLE 1** *Continued*

| Perforated Opening    |                              | Medium Light |          |                 |              |              | Medium   |                 |              | Medium Heavy |          |                 |              | Heavy        |          |                 |              |
|-----------------------|------------------------------|--------------|----------|-----------------|--------------|--------------|----------|-----------------|--------------|--------------|----------|-----------------|--------------|--------------|----------|-----------------|--------------|
| Standard (metric), mm | USA Industrial Standard, in. | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % | Opening, in. | Bar, in. | Gage-Steel, in. | Open Area, % |
| 600                   | 0.023                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.023        | 0.032    | 28              | 15.8         |
| 500                   | 0.020                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.020        | ...      | ...             | ...          |
| 500                   | 0.020                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.020        | 0.025    | 30              | 17.9         |
| 500                   | 0.020                        | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | ...          | ...      | ...             | ...          | 0.020        | 0.025    | 28              | 17.9         |

**4.4 Bar**—A choice of several bars is shown for each standard opening from 5-in. (125-mm) to 0.078-in. (2-mm) opening, inclusive. For practical reasons, the number of bars or grades available for openings finer than 0.078 in. is progressively reduced.

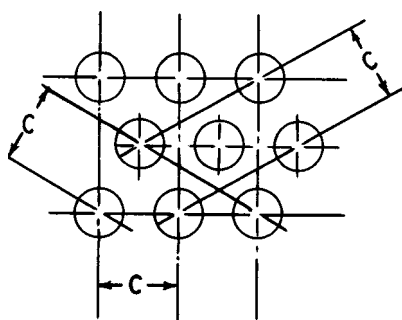
**4.5 Gage**—A choice of several gages is shown for each standard opening for 5 in. (125 mm) to 0.078 in. (2 mm). For practical reasons, the number of gages or grades available for openings finer than 0.078 in. is progressively reduced.

**NOTE 1**—The gages shown in **Table 1** are practical for a low-carbon steel plate. For other materials, consult your perforated plate supplier.

**4.6 Equivalent Metric Specification**—Table X1, in the Appendix, shows the equivalent metric specifications to the USA Standard, punched in standard **ISO Recommendation R388-1964** thickness of plate.

## 5. Types of Perforated Pattern

**5.1** This specification covers round openings arranged in a staggered 60° pattern with their centers nominally at the vertices of equilateral triangles (See **Fig. 3**).



**FIG. 3** Arrangement of Round Apertures

## 6. Metal Composition of Plate

**6.1** Perforated plate can be punched from a great variety of metals and alloys, but the following are most commonly used:

- Steel, low-carbon
- Steel, high-carbon
- Steel, heat-treated
- Steel, galvanized
- Stainless steel, Type 304
- Stainless steel, Type 316
- Stainless steel, Type 410
- Brass (Cu 80, Zn 20)
- Manganese bronze (Cu 61, Zn 37)
- Monel (high nickel-copper alloy)
- Aluminum (all grades)

## 7. Tolerances

**7.1 Openings**—Tolerances on openings in USA Standard Specifications for Industrial Perforated Plate and Screens (**Table 1** and **Table X1.1**) shall be in accordance with those listed in **Table 2**.

**7.2 Bars**—Tolerances on bars used in USA Standard Specification for Industrial Perforated Plate and Screens (**Table 1** and **Table X1.1**) shall be in accordance with those listed in **Table 3**.

**7.3 Gages**—Tolerances on gages used in USA Standard Specifications for Industrial Perforated Plate and Screens (**Table 1** and **Table X1.1**) shall be in accordance with those listed in **Table 4**.

**NOTE 2**—The tolerances expressed in inch-pound units are taken from the current AISI<sup>5</sup> values.

## 8. Keywords

8.1 industrial perforated plate; industrial screens; openings; particle size; perforated openings; perforated plate; screens

<sup>5</sup> Available from American Iron and Steel Institute (AISI), 1140 Connecticut Ave., NW, Suite 705, Washington, DC 20036, <http://www.steel.org>.

**TABLE 2 Tolerances on Openings of USA Standard Specifications for Industrial Perforated Plate and Screens**

| Perforated Opening    |                              |                       | Tolerance on Openings |                              |
|-----------------------|------------------------------|-----------------------|-----------------------|------------------------------|
| Standard (metric), mm | USA Industrial Standard, in. | Additional Sizes, in. | Standard (metric), mm | USA Industrial Standard, in. |
| 125.0                 | 5                            | ...                   | ±2.5                  | ±0.100                       |
| ...                   | ...                          | 4½                    | ...                   | ±0.090                       |
| 106.0                 | 4¼                           | ...                   | ±2.1                  | ±0.085                       |
| 100.0                 | 4                            | ...                   | ±2.0                  | ±0.080                       |
| ...                   | ...                          | 3¾                    | ...                   | ±0.075                       |
| 90.0                  | 3½                           | ...                   | ±1.8                  | ±0.070                       |
| ...                   | ...                          | 3¼                    | ...                   | ±0.065                       |
| 75.0                  | 3                            | ...                   | ±1.5                  | ±0.060                       |
| ...                   | ...                          | 2¾                    | ...                   | ±0.055                       |
| 63.0                  | 2½                           | ...                   | ±1.3                  | ±0.050                       |
| ...                   | ...                          | 2¼                    | ...                   | ±0.045                       |
| 53.0                  | 2⅞                           | ...                   | ±1.1                  | ±0.043                       |
| 50.0                  | 2                            | ...                   | ±1.0                  | ±0.040                       |
| ...                   | ...                          | 1⅞                    | ...                   | ±0.038                       |
| 45.0                  | 1¾                           | ...                   | ±0.9                  | ±0.035                       |
| ...                   | ...                          | 1⅝                    | ...                   | ±0.033                       |
| 38.1                  | 1½                           | ...                   | ±0.8                  | ±0.030                       |
| ...                   | ...                          | 1⅜                    | ...                   | ±0.028                       |
| 31.5                  | 1¼                           | ...                   | ±0.6                  | ±0.025                       |
| ...                   | ...                          | 1⅓                    | ...                   | ±0.024                       |
| ...                   | ...                          | 1¼                    | ...                   | ±0.023                       |
| 26.5                  | 1⅛                           | ...                   | ±0.5                  | ±0.021                       |
| 25.0                  | 1                            | ...                   | ±0.5                  | ±0.020                       |
| ...                   | ...                          | 15/16                 | ...                   | ±0.019                       |
| 22.4                  | 7/8                          | ...                   | ±0.46                 | ±0.018                       |
| ...                   | ...                          | 13/16                 | ...                   | ±0.016                       |
| 19.0                  | ¾                            | ...                   | ±0.38                 | ±0.015                       |
| ...                   | ...                          | 11/16                 | ...                   | ±0.014                       |
| 16.0                  | 5/8                          | ...                   | ±0.32                 | ±0.013                       |
| ...                   | ...                          | 9/16                  | ...                   | ±0.012                       |
| 13.2                  | 17/32                        | ...                   | ±0.30                 | ±0.012                       |
| 12.5                  | 1/2                          | ...                   | ±0.28                 | ±0.011                       |
| ...                   | ...                          | 15/32                 | ...                   | ±0.011                       |
| 11.2                  | 7/16                         | ...                   | ±0.28                 | ±0.011                       |
| 9.5                   | 3/8                          | ...                   | ±0.28                 | ±0.010                       |
| 8.0                   | 5/16                         | ...                   | ±0.26                 | ±0.010                       |
| 6.7                   | 17/64                        | ...                   | ±0.25                 | ±0.009                       |
| 6.3                   | 1/4                          | ...                   | ±0.25                 | ±0.009                       |
| 5.6                   | 7/32                         | ...                   | ±0.24                 | ±0.009                       |
| 4.75                  | 3/16                         | ...                   | ±0.21                 | ±0.008                       |
| 4.00                  | 5/32                         | ...                   | ±0.19                 | ±0.007                       |
| 3.35                  | 0.127 (1/8)                  | ...                   | ±0.17                 | ±0.006                       |
| 2.80                  | 7/64                         | ...                   | ±0.150                | ±0.006                       |
| 2.36                  | 3/32                         | ...                   | ±0.135                | ±0.005                       |
| 2.00                  | 0.078                        | ...                   | ±0.125                | ±0.005                       |
| 1.70                  | 0.066                        | ...                   | ±0.110                | ±0.004                       |
| 1.40                  | 0.055                        | ...                   | ±0.100                | ±0.004                       |
| 1.18                  | 0.045                        | ...                   | ±0.085                | ±0.003                       |
| 1.00                  | 0.039                        | ...                   | ±0.070                | ±0.003                       |
| 830 µm                | 0.032                        | ...                   | ±60 µm                | ±0.002                       |
| 710                   | 0.027                        | ...                   | ±50 µm                | ±0.002                       |
| 600                   | 0.023                        | ...                   | ±45 µm                | ±0.002                       |
| 500                   | 0.020                        | ...                   | ±40 µm                | ±0.002                       |

**TABLE 3 Tolerances on Bars of USA Standard Specifications for Industrial Perforated Plate and Screens**

| Perforated Opening    |                              |                       | Tolerance on Average Bar |                              |
|-----------------------|------------------------------|-----------------------|--------------------------|------------------------------|
| Standard (metric), mm | USA Industrial Standard, in. | Additional Sizes, in. | Standard (metric), mm    | USA Industrial Standard, in. |
| 125.0                 | 5                            | ...                   | ±3.2                     | ±0.125                       |
| ...                   | ...                          | 4½                    | ...                      | ±0.122                       |
| 106.0                 | 4¼                           | ...                   | ±2.9                     | ±0.113                       |
| 100.0                 | 4                            | ...                   | ±2.7                     | ±0.107                       |
| ...                   | ...                          | 3¾                    | ...                      | ±0.102                       |
| 90.0                  | 3½                           | ...                   | ±2.5                     | ±0.097                       |
| ...                   | ...                          | 3¼                    | ...                      | ±0.089                       |
| 75.0                  | 3                            | ...                   | ±2.1                     | ±0.081                       |
| ...                   | ...                          | 2¾                    | ...                      | ±0.076                       |
| 63.0                  | 2½                           | ...                   | ±1.8                     | ±0.069                       |
| ...                   | ...                          | 2¼                    | ...                      | ±0.063                       |
| 53.0                  | 2⅞                           | ...                   | ±1.5                     | ±0.059                       |
| 50.0                  | 2                            | ...                   | ±1.4                     | ±0.056                       |
| ...                   | ...                          | 1⅞                    | ...                      | ±0.054                       |
| 45.0                  | 1¾                           | ...                   | ±1.3                     | ±0.051                       |
| ...                   | ...                          | 1⅝                    | ...                      | ±0.047                       |
| 37.5                  | 1½                           | ...                   | ±1.1                     | ±0.043                       |
| ...                   | ...                          | 1⅜                    | ...                      | ±0.040                       |
| 31.5                  | 1¼                           | ...                   | ±0.9                     | ±0.037                       |
| ...                   | ...                          | 1⅓                    | ...                      | ±0.035                       |
| ...                   | ...                          | 1¼                    | ...                      | ±0.034                       |
| 26.5                  | 1⅛                           | ...                   | ±0.8                     | ±0.032                       |
| 25.0                  | 1                            | ...                   | ±0.8                     | ±0.030                       |
| ...                   | ...                          | 15/16                 | ...                      | ±0.029                       |
| 22.4                  | 7/8                          | ...                   | ±0.7                     | ±0.028                       |
| ...                   | ...                          | 13/16                 | ...                      | ±0.026                       |
| 19.0                  | ¾                            | ...                   | ±0.6                     | ±0.024                       |
| ...                   | ...                          | 11/16                 | ...                      | ±0.022                       |
| 16.0                  | 5/8                          | ...                   | ±0.5                     | ±0.021                       |
| ...                   | ...                          | 9/16                  | ...                      | ±0.019                       |
| 13.2                  | 17/32                        | ...                   | ±0.46                    | ±0.018                       |
| 12.5                  | 1/2                          | ...                   | ±0.44                    | ±0.017                       |
| ...                   | ...                          | 15/32                 | ...                      | ±0.017                       |
| 11.2                  | 7/16                         | ...                   | ±0.41                    | ±0.016                       |
| 9.5                   | 3/8                          | ...                   | ±0.36                    | ±0.014                       |
| 8.0                   | 5/16                         | ...                   | ±0.32                    | ±0.013                       |
| 6.7                   | 17/64                        | ...                   | ±0.29                    | ±0.011                       |
| 6.3                   | 1/4                          | ...                   | ±0.28                    | ±0.011                       |
| 5.6                   | 7/32                         | ...                   | ±0.27                    | ±0.011                       |
| 4.75                  | 3/16                         | ...                   | ±0.23                    | ±0.009                       |
| 4.00                  | 5/32                         | ...                   | ±0.22                    | ±0.009                       |
| 3.35                  | 0.127 (1/8)                  | ...                   | ±0.20                    | ±0.008                       |
| 2.80                  | 7/64                         | ...                   | ±0.18                    | ±0.007                       |
| 2.36                  | 3/32                         | ...                   | ±0.16                    | ±0.006                       |
| 2.00                  | 0.078                        | ...                   | ±0.150                   | ±0.006                       |
| 1.70                  | 0.066                        | ...                   | ±0.135                   | ±0.005                       |
| 1.40                  | 0.055                        | ...                   | ±0.125                   | ±0.005                       |
| 1.18                  | 0.045                        | ...                   | ±0.110                   | ±0.004                       |
| 1.00                  | 0.039                        | ...                   | ±0.090                   | ±0.004                       |
| 830 µm                | 0.032                        | ...                   | ±80 µm                   | ±0.003                       |
| 710                   | 0.027                        | ...                   | ±70 µm                   | ±0.003                       |
| 600                   | 0.023                        | ...                   | ±65 µm                   | ±0.003                       |
| 500                   | 0.020                        | ...                   | ±60 µm                   | ±0.002                       |

**TABLE 4 Tolerance on Thickness of USA Standard Specifications for Industrial Perforated Plate and Screens**

| Gage                  |                              | Steel                                  | Tolerance on Gage     |                              |
|-----------------------|------------------------------|----------------------------------------|-----------------------|------------------------------|
| Standard (metric), mm | USA Industrial Standard, in. | USA Industrial Decimal Equivalent, in. | Standard (metric), mm | USA Industrial Standard, in. |
| 25.4                  | 1                            |                                        | + 1.00<br>–0.25       | + 0.040<br>–0.010            |
| 22.4                  | 7/8                          |                                        | –0.25<br>+ 0.89       | + 0.035<br>–0.010            |
| 19.0                  | 3/4                          |                                        | + 0.84<br>–0.25       | + 0.033<br>–0.010            |
| 16.0                  | 5/8                          |                                        | + 0.79<br>–0.25       | + 0.031<br>–0.010            |
| 12.5                  | 1/2                          |                                        | + 0.76<br>–0.25       | + 0.030<br>–0.010            |
| 9.50                  | 3/8                          |                                        | + 0.66<br>–0.25       | + 0.026<br>–0.010            |
| 8.00                  | 5/16                         |                                        | + 0.64<br>–0.25       | + 0.025<br>–0.010            |
| 6.30                  | 1/4                          |                                        | + 0.53<br>–0.25       | + 0.021<br>–0.010            |
| 4.75                  | 3/16                         |                                        | + 0.51<br>–0.25       | + 0.020<br>–0.010            |
| 4.25                  | No. 8 USS gage               | 0.1644                                 | ±0.25                 | ±0.010                       |
| 3.35                  | 10                           | 0.1345                                 | ±0.25                 | ±0.010                       |
| 3.00                  | 11                           | 0.1196                                 | ±0.25                 | ±0.010                       |
| 2.65                  | 12                           | 0.1046                                 | ±0.25                 | ±0.010                       |
| 1.90                  | 14                           | 0.0747                                 | ±0.18                 | ±0.007                       |
| 1.52                  | 16                           | 0.0598                                 | ±0.13                 | ±0.005                       |
| 1.21                  | 18                           | 0.0478                                 | ±0.10                 | ±0.004                       |
| 0.91                  | 20                           | 0.0359                                 | ±0.08                 | ±0.003                       |
| 0.76                  | 22                           | 0.0299                                 | ±0.08                 | ±0.003                       |
| 0.61                  | 24                           | 0.0239                                 | ±0.08                 | ±0.003                       |
| 0.45                  | 26                           | 0.0179                                 | ±0.05                 | ±0.002                       |
| 0.38                  | 28                           | 0.0149                                 | ±0.05                 | ±0.002                       |
| 0.30                  | 30                           | 0.0120                                 | ±0.05                 | ±0.002                       |

## SUPPLEMENTARY REQUIREMENTS

The following sections shall be applicable when U.S. government contractual matters are involved.

### S1. Responsibility for Inspection

S1.1 Unless otherwise specified in the contract or purchase order, the producer is responsible for the performance of all inspection and test requirements specified herein. Except as otherwise specified in the contract or order, the producer may use his own or any other suitable facilities for the performance of the inspection and test requirements specified herein unless disapproved by the purchaser. The purchaser shall have the right to perform any of the inspections and tests set forth in this specification where such inspections are deemed necessary to ensure that material conforms to prescribed requirements.

### S2. Government Procurement

S2.1 Unless otherwise specified in the contract, the material shall be packaged in accordance with the suppliers' standard practice which will be acceptable to the carrier at lowest rates. Containers and packing shall comply with the Uniform Freight Classification rules or National Motor Freight Classification rules. Marking for shipment of such material shall be in accordance with **Fed. Std. 123** for civil agencies and **Mil-Std-129** for military agencies.



## APPENDIXES

(Nonmandatory Information)

## X1. EQUIVALENT METRIC SPECIFICATIONS

X1.1 The metric equivalent to the USA Standard Specification for Perforated Plate and Screens is shown in **Table X1.1** and is published for the convenience of users in countries on full metric standard and to facilitate comparison of the USA Standard with national standards on locally available specifications.

X1.2 In the metric table, the standard opening designations

and bar sizes are identical to those in the USA Standard (**Table 1**), but the thicknesses of material are the nearest Standard ISO metric plate gages to the one used in the corresponding specification in the USA Standard.

X1.3 The tolerances on openings, average bar, and thickness of material are as shown in the appropriate columns of **Table 2**, **Table 3**, and **Table 4**.

**TABLE X1.1 USA Standard Specifications for Industrial Perforated Plate and Screens (Round Opening Series)—(Metric Equivalents)**

| Perforated Opening    |                              | Medium Light |         |                |              | Medium      |         |                |              | Medium Heavy |         |                |              | Heavy       |         |                |              |
|-----------------------|------------------------------|--------------|---------|----------------|--------------|-------------|---------|----------------|--------------|--------------|---------|----------------|--------------|-------------|---------|----------------|--------------|
| Standard (metric), mm | USA Industrial Standard, in. | Opening, mm  | Bar, mm | Gage-Steel, mm | Open Area, % | Opening, mm | Bar, mm | Gage-Steel, mm | Open Area, % | Opening, mm  | Bar, mm | Gage-Steel, mm | Open Area, % | Opening, mm | Bar, mm | Gage-Steel, mm | Open Area, % |
| 125                   | 5.0                          | 125          | 12.50   | 12.50          | 74.9         | 125         | 16.00   | 16.00          | 71.3         | 125          | 19.00   | 19.00          | 68.3         | 125         | 25.40   | 25.40          | 62.6         |
| 125                   | 5.0                          | 125          | 16.00   | 9.50           | 71.3         | 125         | 19.00   | 12.50          | 68.3         | 125          | 22.40   | 16.00          | 65.2         | 125         | 28.50   | 22.40          | 60.1         |
| 125                   | 5.0                          | 125          | 16.00   | 12.50          | 71.3         | 125         | 19.00   | 16.00          | 68.3         | 125          | 22.40   | 19.00          | 65.2         | 125         | 28.50   | 25.40          | 60.1         |
| 106                   | 4.25                         | 106          | 12.50   | 12.50          | 72.5         | 106         | 16.00   | 16.00          | 68.4         | 106          | 19.00   | 19.00          | 65.2         | 106         | 25.40   | 25.40          | 59.0         |
| 106                   | 4.25                         | 106          | 16.00   | 9.50           | 68.4         | 106         | 19.00   | 12.50          | 65.2         | 106          | 22.40   | 16.00          | 61.8         | 106         | 28.50   | 22.40          | 56.3         |
| 106                   | 4.25                         | 106          | 16.00   | 12.50          | 68.4         | 106         | 19.00   | 16.00          | 65.2         | 106          | 22.40   | 19.00          | 61.8         | 106         | 28.50   | 25.40          | 56.3         |
| 100                   | 4.0                          | 100          | 12.50   | 12.50          | 71.7         | 100         | 16.00   | 16.00          | 67.4         | 100          | 19.00   | 19.00          | 67.4         | 100         | 25.40   | 25.40          | 57.7         |
| 100                   | 4.0                          | 100          | 16.00   | 9.50           | 67.4         | 100         | 19.00   | 12.50          | 64.0         | 100          | 22.40   | 16.00          | 60.5         | 100         | 28.50   | 22.40          | 54.9         |
| 100                   | 4.0                          | 100          | 16.00   | 12.50          | 67.4         | 100         | 19.00   | 16.00          | 64.0         | 100          | 22.40   | 19.00          | 60.5         | 100         | 28.50   | 25.40          | 54.9         |
| 90                    | 3.5                          | 90           | 12.50   | 12.50          | 69.9         | 90          | 16.00   | 16.00          | 65.4         | 90           | 19.00   | 19.00          | 61.8         | 90          | 22.40   | 22.40          | 58.1         |
| 90                    | 3.5                          | 90           | 16.00   | 9.50           | 65.4         | 90          | 19.00   | 12.50          | 61.8         | 90           | 22.40   | 16.00          | 58.1         | 90          | 25.40   | 19.00          | 55.2         |
| 90                    | 3.5                          | 90           | 16.00   | 12.50          | 65.4         | 90          | 19.00   | 16.00          | 61.8         | 90           | 22.40   | 19.00          | 58.1         | 90          | 25.40   | 22.40          | 55.2         |
| 75                    | 3.0                          | 75           | 9.50    | 9.50           | 71.4         | 75          | 12.50   | 12.50          | 66.6         | 75           | 16.00   | 16.00          | 61.6         | 75          | 19.00   | 19.00          | 57.7         |
| 75                    | 3.0                          | 75           | 12.50   | 8.00           | 66.6         | 75          | 16.00   | 9.50           | 61.6         | 75           | 19.00   | 12.50          | 57.7         | 75          | 22.40   | 16.00          | 53.8         |
| 75                    | 3.0                          | 75           | 12.50   | 9.50           | 66.6         | 75          | 16.00   | 12.50          | 61.6         | 75           | 19.00   | 16.00          | 57.7         | 75          | 22.40   | 19.00          | 53.8         |
| 63                    | 2.5                          | 63           | 9.50    | 9.50           | 68.5         | 63          | 12.50   | 12.50          | 63.1         | 63           | 16.00   | 16.00          | 57.7         | 63          | 19.00   | 19.00          | 53.5         |
| 63                    | 2.5                          | 63           | 12.50   | 8.00           | 63.1         | 63          | 16.00   | 9.50           | 57.7         | 63           | 19.00   | 12.50          | 53.5         | 63          | 22.40   | 16.00          | 49.4         |
| 63                    | 2.5                          | 63           | 12.50   | 9.50           | 63.1         | 63          | 16.00   | 12.50          | 57.7         | 63           | 19.00   | 16.00          | 53.5         | 63          | 22.40   | 19.00          | 49.4         |
| 53                    | 2.125                        | 53           | 8.00    | 8.00           | 68.5         | 53          | 9.50    | 9.50           | 65.2         | 53           | 12.50   | 12.50          | 59.4         | 53          | 16.00   | 16.00          | 53.5         |
| 53                    | 2.125                        | 53           | 9.50    | 6.30           | 65.2         | 53          | 12.50   | 8.00           | 59.4         | 53           | 16.00   | 9.50           | 53.5         | 53          | 19.00   | 12.50          | 49.1         |
| 53                    | 2.125                        | 53           | 9.50    | 8.00           | 65.2         | 53          | 12.50   | 9.50           | 59.4         | 53           | 16.00   | 12.50          | 53.5         | 53          | 19.00   | 16.00          | 49.1         |
| 50                    | 2.0                          | 50           | 8.00    | 8.00           | 67.4         | 50          | 9.50    | 9.50           | 64.0         | 50           | 12.50   | 12.50          | 58.0         | 50          | 16.00   | 16.00          | 52.1         |
| 50                    | 2.0                          | 50           | 9.50    | 6.30           | 64.0         | 50          | 12.50   | 8.00           | 58.0         | 50           | 16.00   | 9.50           | 52.1         | 50          | 19.00   | 12.50          | 47.6         |
| 50                    | 2.0                          | 50           | 9.50    | 8.00           | 64.0         | 50          | 12.50   | 9.50           | 58.0         | 50           | 16.00   | 12.50          | 52.1         | 50          | 19.00   | 16.00          | 47.6         |
| 45                    | 1.75                         | 45           | 8.00    | 8.00           | 65.4         | 45          | 9.50    | 9.50           | 61.8         | 45           | 12.50   | 12.50          | 55.5         | 45          | 16.00   | 16.00          | 49.4         |
| 45                    | 1.75                         | 45           | 9.50    | 6.30           | 61.8         | 45          | 12.50   | 8.00           | 55.5         | 45           | 16.00   | 9.50           | 49.4         | 45          | 19.00   | 12.50          | 44.8         |
| 45                    | 1.75                         | 45           | 9.50    | 8.00           | 61.8         | 45          | 12.50   | 9.50           | 55.5         | 45           | 16.00   | 12.50          | 49.4         | 45          | 19.00   | 16.00          | 44.8         |
| 37.5                  | 1.5                          | 37.5         | 6.30    | 6.30           | 66.5         | 37.5        | 8.00    | 8.00           | 61.6         | 37.5         | 9.50    | 9.50           | 57.7         | 37.5        | 12.50   | 12.50          | 51.0         |
| 37.5                  | 1.5                          | 37.5         | 8.00    | 4.75           | 61.6         | 37.5        | 9.50    | 6.30           | 57.7         | 37.5         | 12.50   | 8.00           | 51.0         | 37.5        | 16.00   | 9.50           | 44.6         |
| 37.5                  | 1.5                          | 37.5         | 8.00    | 6.30           | 61.6         | 37.5        | 9.50    | 8.00           | 57.7         | 37.5         | 12.50   | 9.50           | 51.0         | 37.5        | 16.00   | 12.50          | 44.6         |
| 31.5                  | 1.25                         | 31.5         | 6.30    | 6.30           | 63.0         | 31.5        | 8.00    | 8.00           | 57.7         | 31.5         | 9.50    | 9.50           | 53.5         | 31.5        | 12.50   | 12.50          | 46.5         |
| 31.5                  | 1.25                         | 31.5         | 8.00    | 4.75           | 57.7         | 31.5        | 9.50    | 6.30           | 53.5         | 31.5         | 12.50   | 8.00           | 46.5         | 31.5        | 16.00   | 9.50           | 39.9         |
| 31.5                  | 1.25                         | 31.5         | 8.00    | 6.30           | 57.7         | 31.5        | 9.50    | 8.00           | 53.5         | 31.5         | 12.50   | 9.50           | 46.5         | 31.5        | 16.00   | 12.50          | 39.9         |
| 26.5                  | 1.06                         | 26.5         | 4.75    | 4.75           | 65.2         | 26.5        | 6.30    | 6.30           | 59.2         | 26.5         | 8.00    | 8.00           | 53.5         | 26.5        | 9.50    | 9.50           | 49.1         |
| 26.5                  | 1.06                         | 26.5         | 6.30    | 4.25           | 59.2         | 26.5        | 8.00    | 4.75           | 53.5         | 26.5         | 9.50    | 6.30           | 49.1         | 26.5        | 12.50   | 8.00           | 41.9         |



TABLE X1.1 Continued

| Perforated Opening    |                              | Medium Light |         |                |              | Medium      |         |                |              | Medium Heavy |         |                |              | Heavy       |         |                |              |
|-----------------------|------------------------------|--------------|---------|----------------|--------------|-------------|---------|----------------|--------------|--------------|---------|----------------|--------------|-------------|---------|----------------|--------------|
| Standard (metric), mm | USA Industrial Standard, in. | Opening, mm  | Bar, mm | Gage-Steel, mm | Open Area, % | Opening, mm | Bar, mm | Gage-Steel, mm | Open Area, % | Opening, mm  | Bar, mm | Gage-Steel, mm | Open Area, % | Opening, mm | Bar, mm | Gage-Steel, mm | Open Area, % |
| 26.5                  | 1.06                         | 26.5         | 6.30    | 4.75           | 59.2         | 26.5        | 8.00    | 6.30           | 53.5         | 26.5         | 9.50    | 8.00           | 49.1         | 26.5        | 12.50   | 9.50           | 41.9         |
| 25                    | 1.0                          | 25           | 4.75    | 4.75           | 64.0         | 25          | 6.30    | 6.30           | 57.9         | 25           | 8.00    | 8.00           | 52.1         | 25          | 9.50    | 9.50           | 47.6         |
| 25                    | 1.0                          | 25           | 6.30    | 4.25           | 57.9         | 25          | 8.00    | 4.75           | 52.1         | 25           | 9.50    | 6.30           | 47.6         | 25          | 12.50   | 8.00           | 40.3         |
| 25                    | 1.0                          | 25           | 6.30    | 4.75           | 57.9         | 25          | 8.00    | 6.30           | 52.1         | 25           | 9.50    | 8.00           | 47.6         | 25          | 12.50   | 9.50           | 40.3         |
| 22.4                  | 0.875                        | 22.4         | 4.75    | 4.75           | 61.7         | 22.4        | 6.30    | 6.30           | 55.2         | 22.4         | 8.00    | 8.00           | 49.2         | 22.4        | 9.50    | 9.50           | 44.7         |
| 22.4                  | 0.875                        | 22.4         | 6.30    | 4.25           | 55.2         | 22.4        | 8.00    | 4.75           | 49.2         | 22.4         | 9.50    | 6.30           | 44.7         | 22.4        | 12.50   | 8.00           | 37.3         |
| 22.4                  | 0.875                        | 22.4         | 6.30    | 4.75           | 55.2         | 22.4        | 8.00    | 6.30           | 49.2         | 22.4         | 9.50    | 8.00           | 44.7         | 22.4        | 12.50   | 9.50           | 37.3         |
| 19                    | 0.750                        | 19           | 4.75    | 4.75           | 58.0         | 19          | 6.30    | 6.30           | 51.1         | 19           | 8.00    | 8.00           | 44.9         | 19          | 9.50    | 9.50           | 40.3         |
| 19                    | 0.750                        | 19           | 6.30    | 4.25           | 51.1         | 19          | 8.00    | 4.75           | 44.9         | 19           | 9.50    | 6.30           | 40.3         | 19          | 12.50   | 8.00           | 33.0         |
| 19                    | 0.750                        | 19           | 6.30    | 4.75           | 51.1         | 19          | 8.00    | 6.30           | 44.9         | 19           | 9.50    | 8.00           | 40.3         | 19          | 12.50   | 9.50           | 33.0         |
| 16                    | 0.625                        | 16           | 4.00    | 4.25           | 58.0         | 16          | 4.75    | 4.75           | 53.9         | 16           | 6.30    | 6.30           | 46.7         | 16          | 8.00    | 8.00           | 40.3         |
| 16                    | 0.625                        | 16           | 4.75    | 3.35           | 53.9         | 16          | 6.30    | 4.25           | 46.7         | 16           | 8.00    | 4.75           | 40.3         | 16          | 9.50    | 6.30           | 35.7         |
| 16                    | 0.625                        | 16           | 4.75    | 4.25           | 53.9         | 16          | 6.30    | 4.75           | 46.7         | 16           | 8.00    | 6.30           | 40.3         | 16          | 9.50    | 8.00           | 35.7         |
| 13.2                  | 0.531                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | 13.2         | 4.00    | 4.75           | 53.4         | 13.2        | 5.55    | 6.30           | 44.9         |
| 13.2                  | 0.531                        | ...          | ...     | ...            | ...          | 13.2        | 4.00    | 3.35           | 53.4         | 13.2         | 5.55    | 4.25           | 44.9         | 13.2        | 8.75    | 4.75           | 32.8         |
| 13.2                  | 0.531                        | ...          | ...     | ...            | ...          | 13.2        | 4.00    | 4.25           | 53.4         | 13.2         | 5.55    | 4.75           | 44.9         | 13.2        | 8.75    | 6.30           | 32.8         |
| 12.5                  | 0.500                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | 12.5         | 4.75    | 4.75           | 47.6         | 12.5        | 6.30    | 6.30           | 40.1         |
| 12.5                  | 0.500                        | ...          | ...     | ...            | ...          | 12.5        | 4.75    | 3.35           | 47.6         | 12.5         | 6.30    | 4.25           | 40.1         | 12.5        | 8.00    | 4.75           | 33.7         |
| 12.5                  | 0.500                        | ...          | ...     | ...            | ...          | 12.5        | 4.75    | 4.25           | 47.6         | 12.5         | 6.30    | 4.75           | 40.1         | 12.5        | 8.00    | 6.30           | 33.7         |
| 11.2                  | 0.438                        | 11.2         | 4.00    | 3.35           | 49.2         | 11.2        | 4.75    | 4.25           | 44.7         | 11.2         | 6.30    | 4.75           | 37.1         | 11.2        | 8.00    | 6.30           | 30.8         |
| 11.2                  | 0.438                        | 11.2         | 4.75    | 3.00           | 44.7         | 11.2        | 6.30    | 3.35           | 37.1         | 11.2         | 8.00    | 4.25           | 30.8         | 11.2        | 11.20   | 4.75           | 22.7         |
| 11.2                  | 0.438                        | 11.2         | 4.75    | 3.35           | 44.7         | 11.2        | 6.30    | 4.25           | 37.1         | 11.2         | 8.00    | 4.75           | 30.8         | 11.2        | 11.20   | 6.30           | 22.7         |
| 9.5                   | 0.375                        | 9.5          | 3.15    | 3.00           | 51.1         | 9.5         | 4.75    | 3.35           | 40.3         | 9.5          | 5.55    | 4.25           | 36.1         | 9.5         | 6.30    | 4.75           | 32.8         |
| 9.5                   | 0.375                        | 9.5          | 4.75    | 2.65           | 40.3         | 9.5         | 5.55    | 3.00           | 36.1         | 9.5          | 6.30    | 3.35           | 32.8         | 9.5         | 9.50    | 4.25           | 22.7         |
| 9.5                   | 0.375                        | 9.5          | 4.75    | 3.00           | 40.3         | 9.5         | 5.55    | 3.35           | 36.1         | 9.5          | 6.30    | 4.25           | 32.8         | 9.5         | 9.50    | 4.75           | 22.7         |
| 8                     | 0.313                        | 8            | 2.36    | 3.00           | 54.1         | 8           | 3.15    | 3.35           | 46.7         | 8            | 4.00    | 4.25           | 40.3         | 8           | 4.75    | 4.75           | 35.7         |
| 8                     | 0.313                        | 8            | 3.15    | 2.65           | 46.7         | 8           | 4.00    | 3.00           | 40.3         | 8            | 4.75    | 3.35           | 35.7         | 8           | 6.30    | 4.25           | 28.4         |
| 8                     | 0.313                        | 8            | 3.15    | 3.00           | 46.7         | 8           | 4.00    | 3.35           | 40.3         | 8            | 4.75    | 4.25           | 35.7         | 8           | 6.30    | 4.75           | 28.4         |
| 6.7                   | 0.266                        | ...          | ...     | ...            | ...          | 6.7         | 2.77    | 3.00           | 45.4         | 6.7          | 3.15    | 3.35           | 42.0         | 6.7         | 3.54    | 4.25           | 38.8         |
| 6.7                   | 0.266                        | 6.7          | 2.77    | 1.90           | 45.4         | 6.7         | 3.15    | 2.65           | 42.0         | 6.7          | 3.54    | 3.00           | 38.8         | 6.7         | 4.36    | 3.35           | 33.3         |
| 6.7                   | 0.266                        | 6.7          | 2.77    | 2.65           | 45.4         | 6.7         | 3.15    | 3.00           | 42.0         | 6.7          | 3.54    | 3.35           | 38.8         | 6.7         | 4.36    | 4.25           | 33.3         |
| 6.3                   | 0.250                        | 6.3          | 1.59    | 1.52           | 57.8         | 6.3         | 3.15    | 3.00           | 40.3         | 6.3          | 4.00    | 3.35           | 33.9         | 6.3         | 4.75    | 4.25           | 29.5         |
| 6.3                   | 0.250                        | 6.3          | 3.15    | 1.90           | 40.3         | 6.3         | 4.00    | 2.65           | 33.9         | 6.3          | 4.75    | 3.00           | 29.5         | 6.3         | 6.30    | 3.35           | 22.7         |
| 6.3                   | 0.250                        | 6.3          | 3.15    | 2.65           | 40.3         | 6.3         | 4.00    | 3.00           | 33.9         | 6.3          | 4.75    | 3.35           | 29.5         | 6.3         | 6.30    | 4.25           | 22.7         |
| 5.6                   | 0.219                        | 5.6          | 2.36    | 1.90           | 44.9         | 5.6         | 3.15    | 2.65           | 37.1         | 5.6          | 4.00    | 3.00           | 30.9         | 5.6         | 4.75    | 3.35           | 26.5         |
| 5.6                   | 0.219                        | 5.6          | 3.15    | 1.52           | 37.1         | 5.6         | 4.00    | 1.90           | 30.9         | 5.6          | 4.75    | 2.65           | 26.5         | 5.6         | 5.55    | 3.00           | 22.9         |
| 5.6                   | 0.219                        | 5.6          | 3.15    | 1.90           | 37.1         | 5.6         | 4.00    | 2.65           | 30.9         | 5.6          | 4.75    | 3.00           | 26.5         | 5.6         | 5.55    | 3.35           | 22.9         |
| 4.75                  | 0.188                        | 4.75         | 1.59    | 1.90           | 50.9         | 4.75        | 2.36    | 2.65           | 40.5         | 4.75         | 2.77    | 3.00           | 36.2         | 4.75        | 3.15    | 3.35           | 32.8         |
| 4.75                  | 0.188                        | 4.75         | 2.36    | 1.52           | 40.5         | 4.75        | 2.77    | 1.90           | 36.2         | 4.75         | 3.15    | 2.65           | 32.8         | 4.75        | 4.75    | 3.00           | 22.7         |
| 4.75                  | 0.188                        | 4.75         | 2.36    | 1.90           | 40.5         | 4.75        | 2.77    | 2.65           | 36.2         | 4.75         | 3.15    | 3.00           | 32.8         | 4.75        | 4.75    | 3.35           | 22.7         |
| 4                     | 0.156                        | ...          | ...     | ...            | ...          | 4           | 1.59    | 1.90           | 46.4         | 4            | 2.36    | 2.65           | 35.9         | 4           | 3.15    | 3.00           | 28.4         |
| 4                     | 0.156                        | 4            | 1.59    | 1.21           | 46.4         | 4           | 2.36    | 1.52           | 35.9         | 4            | 3.15    | 1.90           | 28.4         | 4           | 4.00    | 2.65           | 22.7         |
| 4                     | 0.156                        | 4            | 1.59    | 1.52           | 46.4         | 4           | 2.36    | 1.90           | 35.9         | 4            | 3.15    | 2.65           | 28.4         | 4           | 4.00    | 3.00           | 22.7         |
| 3.35                  | 0.127                        | ...          | ...     | ...            | ...          | 3.35        | 1.19    | 1.90           | 49.4         | 3.35         | 1.59    | 2.65           | 41.7         | 3.35        | 2.36    | 3.00           | 31.2         |
| 3.35                  | 0.127                        | 3.35         | 1.19    | 1.21           | 49.4         | 3.35        | 1.59    | 1.52           | 41.7         | 3.35         | 2.36    | 1.90           | 31.2         | 3.35        | 3.15    | 2.65           | 24.1         |
| 3.35                  | 0.127                        | 3.35         | 1.19    | 1.52           | 49.4         | 3.35        | 1.59    | 1.90           | 41.7         | 3.35         | 2.36    | 2.65           | 31.2         | 3.35        | 3.15    | 3.00           | 24.1         |
| 2.8                   | 0.109                        | ...          | ...     | ...            | ...          | 2.80        | 1.59    | 1.52           | 36.9         | 2.8          | 2.36    | 1.90           | 26.7         | 2.8         | 3.54    | 2.65           | 17.7         |
| 2.8                   | 0.109                        | 2.80         | 1.59    | 0.91           | 36.9         | 2.80        | 2.36    | 1.21           | 26.7         | 2.8          | 3.54    | 1.52           | 17.7         | 2.8         | 4.00    | 1.90           | 15.4         |
| 2.8                   | 0.109                        | 2.80         | 1.59    | 1.21           | 36.9         | 2.80        | 2.36    | 1.52           | 26.7         | 2.8          | 3.54    | 1.90           | 17.7         | 2.8         | 4.00    | 2.65           | 15.4         |
| 2.36                  | 0.095                        | ...          | ...     | ...            | ...          | 2.36        | 1.59    | 1.21           | 32.4         | 2.36         | 2.36    | 1.52           | 22.7         | 2.36        | 3.15    | 1.90           | 16.6         |

TABLE X1.1 *Continued*

| Perforated Opening    |                              | Medium Light |         |                |              | Medium      |         |                |              | Medium Heavy |         |                |              | Heavy       |         |                |              |
|-----------------------|------------------------------|--------------|---------|----------------|--------------|-------------|---------|----------------|--------------|--------------|---------|----------------|--------------|-------------|---------|----------------|--------------|
| Standard (metric), mm | USA Industrial Standard, in. | Opening, mm  | Bar, mm | Gage-Steel, mm | Open Area, % | Opening, mm | Bar, mm | Gage-Steel, mm | Open Area, % | Opening, mm  | Bar, mm | Gage-Steel, mm | Open Area, % | Opening, mm | Bar, mm | Gage-Steel, mm | Open Area, % |
| 2.36                  | 0.095                        | 2.36         | 1.59    | 0.76           | 32.4         | 2.36        | 2.36    | 0.91           | 22.7         | 2.36         | 3.15    | 1.21           | 16.6         | 2.36        | 4.00    | 1.52           | 12.5         |
| 2.36                  | 0.095                        | 2.36         | 1.59    | 0.91           | 32.4         | 2.36        | 2.36    | 1.21           | 22.7         | 2.36         | 3.15    | 1.52           | 16.6         | 2.36        | 4.00    | 1.90           | 12.5         |
| 2                     | 0.078                        | ...          | ...     | ...            | ...          | 2           | 0.76    | 1.21           | 47.6         | 2            | 1.19    | 1.52           | 35.7         | 2           | 2.00    | 1.90           | 22.7         |
| 2                     | 0.078                        | 2            | 0.76    | 0.76           | 47.6         | 2           | 1.19    | 0.91           | 35.7         | 2            | 2.00    | 1.21           | 22.7         | 2           | 2.77    | 1.52           | 16.0         |
| 2                     | 0.078                        | 2            | 0.76    | 0.91           | 47.6         | 2           | 1.19    | 1.21           | 35.7         | 2            | 2.00    | 1.52           | 22.7         | 2           | 2.77    | 1.90           | 16.0         |
| 1.7                   | 0.066                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | 1.7          | 1.09    | 1.21           | 33.7         | 1.7         | 1.50    | 1.52           | 25.6         |
| 1.7                   | 0.066                        | ...          | ...     | ...            | ...          | 1.7         | 1.09    | 0.76           | 33.7         | 1.7          | 1.50    | 0.91           | 25.6         | 1.7         | 2.29    | 1.21           | 16.4         |
| 1.7                   | 0.066                        | ...          | ...     | ...            | ...          | 1.7         | 1.09    | 0.91           | 33.7         | 1.7          | 1.50    | 1.21           | 25.6         | 1.7         | 2.29    | 1.52           | 16.4         |
| 1.4                   | 0.055                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | 1.4          | 1.02    | 0.91           | 30.4         | 1.4         | 1.40    | 1.21           | 22.7         |
| 1.4                   | 0.055                        | ...          | ...     | ...            | ...          | 1.4         | 1.02    | 0.61           | 30.4         | 1.4          | 1.40    | 0.76           | 22.7         | 1.4         | 1.78    | 0.91           | 17.6         |
| 1.4                   | 0.055                        | ...          | ...     | ...            | ...          | 1.4         | 1.02    | 0.76           | 30.4         | 1.4          | 1.40    | 0.91           | 22.7         | 1.4         | 1.78    | 1.21           | 17.6         |
| 1.18                  | 0.045                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | 1.18         | 0.53    | 0.76           | 43.1         | 1.18        | 0.84    | 0.91           | 30.9         |
| 1.18                  | 0.045                        | ...          | ...     | ...            | ...          | 1.18        | 0.53    | 0.45           | 43.1         | 1.18         | 0.84    | 0.61           | 30.9         | 1.18        | 1.14    | 0.76           | 23.4         |
| 1.18                  | 0.045                        | ...          | ...     | ...            | ...          | 1.18        | 0.53    | 0.61           | 43.1         | 1.18         | 0.84    | 0.76           | 30.9         | 1.18        | 1.14    | 0.91           | 23.4         |
| 1                     | 0.039                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | ...          | ...     | ...            | ...          | 1           | 0.68    | 0.76           | 32.1         |
| 1                     | 0.039                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | 1            | 0.68    | 0.45           | 32.1         | 1           | 1.00    | 0.61           | 22.7         |
| 1                     | 0.039                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | 1            | 0.68    | 0.61           | 32.1         | 1           | 1.00    | 0.76           | 22.7         |
| 830 $\mu$ m           | 0.033                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | ...          | ...     | ...            | ...          | 830 $\mu$ m | 0.81    | 0.61           | 23.2         |
| 830                   | 0.033                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | 830 $\mu$ m  | 0.81    | 0.38           | 23.2         | 830         | 1.02    | 0.45           | 18.3         |
| 830                   | 0.033                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | 830          | 0.81    | 0.45           | 23.2         | 830         | 1.02    | 0.61           | 18.3         |
| 710                   | 0.027                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | ...          | ...     | ...            | ...          | 710         | 0.76    | 0.45           | 21.2         |
| 710                   | 0.027                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | 710          | 0.76    | 0.30           | 21.2         | 710         | 1.00    | 0.38           | 15.6         |
| 710                   | 0.027                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | 710          | 0.76    | 0.38           | 21.2         | 710         | 1.00    | 0.45           | 15.6         |
| 600                   | 0.023                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          |
| 600                   | 0.023                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | ...          | ...     | ...            | ...          | 600         | 0.81    | 0.30           | 16.4         |
| 600                   | 0.023                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | ...          | ...     | ...            | ...          | 600         | 0.81    | 0.38           | 16.4         |
| 500                   | 0.020                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          |
| 500                   | 0.020                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | ...          | ...     | ...            | ...          | 500         | 0.63    | 0.30           | 17.7         |
| 500                   | 0.020                        | ...          | ...     | ...            | ...          | ...         | ...     | ...            | ...          | ...          | ...     | ...            | ...          | 500         | 0.63    | 0.38           | 17.7         |

## X2. MATERIALS USED FOR INDUSTRIAL PERFORATED PLATE AND SCREENS

X2.1 With a few exceptions, any material normally furnished in a flat sheet or plate can be successfully perforated, but the thickness of the material may have to be adjusted to keep the tonnage required for perforating within the limits of the perforating supplier's equipment.

X2.2 In selecting the material, it is recommended that the

user consider the factors required in the end use of his product, such as abrasion resistance, corrosion resistance, impact resistance, weldability, formability, appearance, and so forth. When a suitable material has been selected, the perforating supplier should be contacted to determine the feasibility of supplying the required complete specification at reasonable cost.

## X3. CHECKING AND CALIBRATING PERFORATED METAL AND SCREENS

X3.1 In checking specifications of industrial perforated plate it is necessary to determine three dimensions: (1) the dimension of the opening, (2) the dimensions of the bar, and (3) the thickness of the plate.

X3.2 *Dimensions of Openings:*

X3.2.1 For openings from 5 in. (125 mm) to 1/4 in. (6.3 mm), measure the opening using a steel rule graduated to 1/64 in. or 0.5 mm or use a vernier inside caliper graduated to 0.001 in. or 0.02 mm. Since any perforated opening has an inherent taper, care should be taken to make all measurements from the

surface of the plate that was uppermost during the punching operation (smoothside).

X3.2.2 For openings from  $\frac{1}{4}$  in. (6.3 mm) to 0.127 in. (3.35 mm) measure the opening using a steel rule graduated to  $\frac{1}{64}$  in. or 0.5 mm.

X3.2.3 For openings from  $\frac{7}{64}$  in. (2.80 mm) to 0.020 in. (500  $\mu$ m), measure the opening using a taper gage similar to that shown in Fig. X3.1.

### X3.3 Dimensions of Bars:

X3.3.1 Bars from  $1\frac{1}{8}$  in. (28.5 mm) to  $\frac{3}{32}$  in. (2.36 mm) may be checked with a steel rule graduated to  $\frac{1}{64}$  in. (0.4 mm) or with a vernier outside caliper graduated to 0.001 in. (0.02 mm) if the nibs will fit into the adjacent openings.

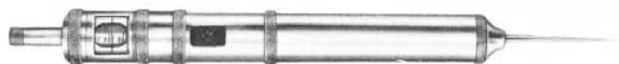


FIG. X3.1 Kwik-Chek Hole Gage

X3.3.2 Bars from 0.090 in. (2.29 mm) to 0.021 in. (0.53 mm) may be checked by use of a steel rule graduated in decimals of an inch or in metric dimensions. The procedure used is to line up the scale along a straight row of openings.

X3.3.3 Set the end of the scale exactly at the edge of a given opening. Follow along the scale until the same edge of another opening lines up exactly with another graduation on the scale. Count the number of openings in this dimension and divide this dimension by the number of included openings. From this figure, subtract the diameter of the opening and the resultant figure will be the dimension of the average bar along that straight row of openings. In order to check the consistency of the bar dimensions in all directions, it is necessary to rotate the scale  $60^\circ$  and repeat the above procedure along the new straight row of openings.

X3.4 Thickness of Plate—Thickness of plate may be checked with a steel rule graduated to  $\frac{1}{64}$  in. or 0.5 mm or with a micrometer graduated to 0.001 in. or 0.02 mm.

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