



Standard Specification for Steel Fibers for Fiber-Reinforced Concrete¹

This standard is issued under the fixed designation A 820; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers minimum requirements for steel fibers intended for use in fiber reinforced concrete. Steel fibers for this purpose are defined as pieces of smooth or deformed cold drawn wire; smooth or deformed cut sheet; melt-extracted fibers; or other steel fibers that are sufficiently small to be dispersed at random in a concrete mixture.

1.2 This specification provides for measurement of dimensions, tolerances from specified dimensions, and required minimum physical properties, and prescribes testing procedures to establish conformance to these requirements.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 The following documents, of the issue in effect on the date of material purchase, form a part of this specification to the extent referenced herein.

2.1 ASTM Standards:

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products²

C 1116 Specification for Fiber-Reinforced Concrete and Shotcrete³

2.2 ACI Document:

544.1R State-of-the-Art Report on Fiber-Reinforced Concrete⁴

3. Terminology

3.1 *Symbols*—The following symbols used in this specification are defined as:

3.1.1 A —cross-sectional area, in.²(mm²).

3.1.2 d —diameter, in. (mm).

3.1.3 f_u —ultimate tensile strength, psi (MPa).

3.1.4 l —length, in. (mm).

3.1.5 λ — l/d = aspect ratio.

3.1.6 The subscript n on dimensional units indicates “nomi-

nal” and the subscript e indicates “equivalent.” “Nominal” and “equivalent” dimensions are calculated from other measurable dimensions or average weights (masses).

4. Classification

4.1 Four general types of steel fibers are identified in this specification based upon the product used as a source of the steel fiber material.

4.1.1 Type I, cold drawn wire.

4.1.2 Type II, cut sheet.

4.1.3 Type III, melt-extracted.

4.1.4 Type IV, other fibers.

4.2 Fibers may be straight or deformed.

5. Ordering Information

5.1 Orders for material under this specification shall include the following:

5.1.1 ASTM designation and year of issue,

5.1.2 Quantity in pounds or tons (kg or Mg),

5.1.3 Type or types permissible (4.1),

5.1.4 Diameter or equivalent diameter (8.1), or range of equivalent diameters (8.1.5),

5.1.5 Length or nominal length (8.1),

5.1.6 Deformations, if required, and

5.1.7 Whether certification by the manufacturer is required including whether a report is to be furnished (15.1).

NOTE 1—For information on satisfactory sizes and aspect ratios, see ACI 544.1R, and contact manufacturers regarding availability.

6. Material and Manufacture

6.1 The materials and manufacturing methods used shall be such that the fibers produced conform to the requirements in this specification.

7. Responsibility for Quality Assurance

7.1 *Responsibility for Inspection*—Unless otherwise specified in the contract or purchase order, the manufacturer is responsible for the performance of all inspection and test requirements specified herein. Except as otherwise specified in the contract or order, the manufacturer may use his own or any other suitable facility 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 assure that material

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² Annual Book of ASTM Standards, Vol 01.03.

³ Annual Book of ASTM Standards, Vol 04.02.

⁴ Available from American Concrete Institute, P.O. Box 19150, Redford Station, Detroit, MI 48219.