



Standard Specification for Steel Fibers for Fiber-Reinforced Concrete¹

This standard is issued under the fixed designation A 820/A 820M; 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. Five types of steel fibers for this purpose are defined as pieces of smooth or deformed cold-drawn wire; smooth or deformed cut sheet; melt-extracted fibers; mill-cut or modified cold-drawn wire 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 In the case of conflict between a requirement of a product specification and a requirement of this specification, the product specification shall prevail. In the case of a conflict between a requirement of the product specification or a requirement of this specification and a more stringent requirement of the purchase order, the purchase order shall prevail. The purchase order requirements shall not take precedence if they, in any way, violate the requirements of the product specification or this specification; for example, by the waiving of a test requirement or by making a test requirement less stringent.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as the standard. Within the text, the inch-pound units are shown in brackets. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

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.

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.05 on Steel Reinforcement.

Current edition approved May 1, 2004. Published May 2004. Originally approved in 1985. Last previous edition approved in 2001 as A 820 – 01.

2.2 ASTM Standards:²

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

C 1116 Specification for Fiber-Reinforced Concrete and Shotcrete

2.3 ACI Document:

544.1R Committee Report on Fiber-Reinforced Concrete³

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *deformed fiber, n*—a fiber that is bent, flattened, or roughened to improve mechanical bond to the concrete matrix.

3.1.2 *modified fiber, n*—a cold-drawn wire fiber whose cross-section has been changed from circular by shaving the wire.

3.1.3 *nominal length, n*—the length of a deformed fiber, out-to-out, after being deformed.

3.1.4 *range of equivalent diameter, d_{e-r} , n*—a set of limits placed on the equivalent diameter by the specifier. See 8.1.6 and Note 3.

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

A = cross-sectional area, mm²[in.²]

d = diameter, mm [in.]

f_u = ultimate tensile strength, MPa [psi]

l = length, mm [in.]

$\lambda = l/d$ = aspect ratio

3.2.1 The subscript n on dimensional units indicates “nominal” and the subscript e indicates “equivalent.” “Nominal” and “equivalent” dimensions are calculated from other measurable dimensions or average mass [weight].

4. Classification

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

4.1.1 Type I, cold-drawn wire.

4.1.2 Type II, cut sheet.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American Concrete Institute, 38800 Country Club Drive, Farmington Hills, MI 48331.

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