

Standard Specification
for

High-Strength Bolts for Structural Steel Joints [Metric]

AASHTO DESIGNATION: M 164M-95



AASHTO M 164-94 is identical to ASTM A 325M-93 except for the following provisions.

1. All references to the ASTM standards contained in ASTM A 325M-93, listed in the following table, shall be replaced with the corresponding AASHTO standard.

Referenced Standards			
ASTM	AASHTO	ASTM	AASHTO
A 325M/A 325	M 164M/M 164	A 588M/A 588	M 222M/M 222
A 490	M 253	A 709M/A 709	M 270M/M 270
A 563M	M 291M	F 436	M 293M

2. Section 14.1 of ASTM A 325M-93, change the phrase "... furnish the test reports ..." to "... furnish certified test reports ...".
3. Replace Section 15.1 of ASTM A 325M-93 with the following:
 - 15.1 The party responsible for the fastener shall be the organization that supplies the fastener to the purchaser. The responsible party shall supply test reports, certified by the manufacturer that indicate the fasteners were manufactured, sampled, tested, and inspected in accordance with this specification and meets all of its requirements.

*Standard Specification
for*

Chemical Admixtures for Concrete

AASHTO DESIGNATION: M 194-94¹
(ASTM DESIGNATION: C 494-92)

1. SCOPE

1.1 This specification covers materials for use as chemical admixtures to be added to portland cement concrete mixtures in the field for the purpose or purposes indicated for the seven types as follows:

1.1.1 *Type A*—Water-reducing admixtures,

1.1.2 *Type B*—Retarding admixtures,

1.1.3 *Type C*—Accelerating admixtures,

1.1.4 *Type D*—Water-reducing and retarding admixtures,

1.1.5 *Type E*—Water-reducing and accelerating admixtures,

1.1.6 *Type F*—Water-reducing, high range admixtures, and

1.1.7 *Type G*—Water-reducing, high range, and retarding admixtures.

1.2 This specification stipulates tests of an admixture with suitable concreting materials as described in Sections 11.1 through 11.3 or with cement, pozzolan, aggregates, and an air-entraining admixture proposed for specific work (Section 11.4). Unless specified otherwise by the purchaser, the tests shall be made using concreting materials as described in Sections 11.1 through 11.3.

1.3 The values stated in SI units are to be regarded as the standard.

NOTE 1—It is recommended that, whenever practicable, tests be made using the cement, pozzolan, aggregates, air-entraining admixture, and the mixture proportions and batching sequence proposed for the specific work (Section 11.4) because the specific effects produced by chemical admixtures may vary with the properties and proportion of the other ingredients of the concrete. For instance, Types F and G admixtures may exhibit much higher water reduction in concrete mixtures having higher cement factors than

that listed in Section 12.1.1. The use of chemical admixtures to produce high-slump (flowing) concrete is covered by ASTM C 1017.

NOTE 2—The purchaser should ensure that the admixture supplied for use in the work is equivalent in composition to the admixture subject to test under this specification (see Section 6, Uniformity and Equivalence).

NOTE 3—Admixtures that contain relatively large amounts of chloride may accelerate corrosion of prestressing steel. Compliance with the requirements of this specification does not constitute assurance of acceptability of the admixture for use in prestressed concrete.

2. REFERENCED DOCUMENTS

2.1 AASHTO Standards:

- M 6 Fine Aggregate for Portland Cement Concrete
- M 80 Coarse Aggregate for Portland Cement Concrete
- M 85 Portland Cement
- M 154 Air-Entraining Admixtures for Concrete
- T 22 Compressive Strength of Cylindrical Concrete Specimens
- T 96 Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine
- T 97 Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
- T 119 Slump of Portland Cement Concrete
- T 121 Mass per Cubic Meter (Cubic Foot), Yield, and Air Content (Gravimetric) of Concrete
- T 126 Making and Curing

2.2 ASTM Standards:

- C 778 Specification for Standard Sand
- C 1017 Specification for Chemical Admixtures for Use in Producing Flowing Concrete
- D 1193 Specification for Reagent Water
- E 100 Specification for ASTM Hydrometers

2.3 American Concrete Institute Standard:

- ACI 211.1-77 Practice for Selecting Proportions for Concrete

3. DEFINITIONS

3.1 *Accelerating Admixture*—an admixture that accelerates the setting and early strength development of concrete.

3.2 *Retarding Admixture*—an admixture that retards the setting of concrete.

3.3 *Water-reducing Admixture*—an admixture that reduces the quantity of mixing water required to produce concrete of a given consistency.

3.4 *Water-reducing Admixtures,*

Concrete Test Specimens in the Laboratory

T 127 Sampling Hydraulic Cement

T 152 Air Content of Freshly Mixed Concrete by the Pressure Method

T 160 Length Change of Cement Mortar and Concrete

T 161 Resistance of Concrete to Rapid Freezing and Thawing

T 197 Time of Settling of Concrete Mixtures by Penetration Resistance

¹ Agrees with ASTM C 494-92 except for the addition of Footnote E, Table 1.