
Standard Specification for Stress-Relieved Steel Wire for Prestressed Concrete

AASHTO Designation: M 204M/M 204-24¹

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ASTM Designation: A421/A421M-21



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Stress-Relieved Steel Wire for Prestressed Concrete



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- 1.1. This specification covers two types of stress-relieved, round, high-carbon steel wire used in prestressed linear concrete construction, as follows:
 - 1.1.1. Type BA wire is used for applications in which cold-end deformation is used for anchoring purposes (Button Anchorage), and
 - 1.1.2. Type WA wire is used for applications in which the ends are anchored by wedges, and no cold-end deformation of the wire is involved (Wedge Anchorage).
- 1.2. A supplementary requirement is provided for use where low-relaxation wire and relaxation testing for that product are required by the purchaser. The supplementary requirement applies only when specified in the purchase order or contract.
- 1.3. This specification is applicable for orders in either SI units (M 204M) or in inch-pound units (M 204). SI units and inch-pound units are not necessarily equivalent. Inch-pound units are shown in brackets in the text for clarity, but they are the applicable values when the material is ordered to M 204.

- 2.1. *AASHTO Standard:*
 - T 244, Mechanical Testing of Steel Products
- 2.2. *ASTM Standards:*
 - A 751, Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
 - E 328, Standard Test Methods for Stress Relaxation Tests for Materials and Structures
- 2.3. *Military Standard:*
 - MIL-STD-129, Marking for Shipment and Storage
- 2.4. *Federal Standard:*
 - Fed. Std. No. 123, Marking for Shipments (Civil Agencies)

3. ORDERING INFORMATION

- 3.1. It shall be the responsibility of the purchaser to specify all requirements that are necessary for material ordered to this specification. Such requirements shall include, but are not limited to, the following:
- 3.1.1. Quantity (m) [ft];
- 3.1.2. Nominal diameter (mm) [in.];
- 3.1.3. Type of wire (BA or WA);
- 3.1.4. Packaging;
- 3.1.5. AASHTO designation and date of issue; and
- 3.1.6. Special requirements, if any.

Note 1—A typical ordering description is as follows: 10,000-kg, 6.35-mm-diameter wire, Type BA in approximately 450-kg, 1.5-m-diameter coils, to M 204M. [22,000-lb, 0.250-in.-diameter wire, Type BA in approximately 1000-lb, 60-in.-diameter coils, to M 204.]

4. MANUFACTURE

- 4.1. *Process*—The steel shall be made by any commercially accepted process.
- 4.2. *Internal Soundness*—A sufficient discard shall be made to ensure freedom from injurious piping and undue segregation.
- 4.3. *Wire*—The wire shall be cold-drawn to size and suitably stress relieved after cold drawing by a continuous heat treatment to produce the prescribed mechanical properties.

5. PHYSICAL REQUIREMENTS

- 5.1. *Tensile Strength*—The tensile strength of Type BA wire and Type WA wire shall conform to the requirements prescribed in Table 1 and shall be determined as prescribed in T 244.

Table 1—Tensile Strength Requirements

Nominal Diameter, mm [in.]	Minimum Tensile Strength, MPa [psi]	
	Type BA	Type WA
4.88 [0.192]	^a	1725 [250,000]
4.98 [0.196]	1655 [240,000]	1725 [250,000]
6.35 [0.250]	1655 [240,000]	1655 [240,000]
7.01 [0.276]	1620 [235,000]	1620 [235,000]

^a This size is not commonly furnished in Type BA wire.

- 5.2. *Yield Strength*:
- 5.2.1. The minimum yield strength for all wire, measured by the one percent extension under load method, shall not be less than 85 percent of the specified minimum tensile strength.