



**Designation: A 881/A881M – 99**

## **Standard Specification for Steel Wire, Deformed, Stress-Relieved or Low-Relaxation for Prestressed Concrete Railroad Ties<sup>1</sup>**

This standard is issued under the fixed designation A 881/A881M; 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.

### **1. Scope**

1.1 This specification covers uncoated, deformed, stress-relieved, and stress-relieved low-relaxation wire for use as prestressed tendons in concrete railroad ties.

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

### **2. Referenced Documents**

#### *2.1 ASTM Standards:*

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products<sup>2</sup>

A 421/A 421M Specification for Uncoated Stress-Relieved Steel Wire for Prestressed Concrete<sup>3</sup>

#### *2.2 U.S. Military Standards:*

MIL-STD-129 Marking for Shipment and Storage<sup>4</sup>

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage<sup>4</sup>

#### *2.3 U.S. Federal Standard:*

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)<sup>4</sup>

### **3. Terminology**

#### *3.1 Definitions of Terms Specific to This Standard:*

3.1.1 *deformed steel wire for railroad ties, n*—a deformed, uncoated steel stress-relieved or low-relaxation wire intended for use as reinforcement in prestressed concrete railroad ties, the wire surface having deformations that reduce longitudinal movement of the wire in such construction, and conform to the provisions of Section 7.

3.1.2 *low-relaxation wire, n*—indented cold-drawn wire, straightened, that receives a suitable continuous thermo-mechanical treatment as the last operation to produce the properties listed.

3.1.3 *stress-relieved wire, n*—indented cold-drawn wire, straightened, that receives a suitable continuous thermal treatment as a last operation to produce the properties listed.

### **4. Ordering Information**

4.1 Orders for deformed wire under this specification should include the following information:

4.1.1 Quantity (mass [weight]),

4.1.2 Name of material (deformed steel stress-relieved or low-relaxation wire for prestressed concrete railroad ties),

4.1.3 Grade (see Table 1),

4.1.4 Nominal diameter,

4.1.5 Packaging,

4.1.6 Stress-relieved or low relaxation,

4.1.7 ASTM designation and year of issue, and

4.1.8 Special requirements, if any.

NOTE 1—A typical ordering description is as follows: 23 000 kg (50 000 lb) Grade 235, deformed stress-relieved steel wire for prestressed concrete railroad ties, 5.03-mm (0.198-in.) diameter wire in approximately 550-kg (1200-lb) coils, ASTM A 881/A 881M-\_\_\_\_\_.

### **5. Materials and Manufacture**

5.1 The steel shall be made by the basic-oxygen, open-hearth, or electric-furnace process.

5.2 The base metal shall be carbon steel of such quality that when drawn and stress relieved, or thermo-mechanically treated at a suitable wire size, shall have the properties and characteristics prescribed in the specification.

### **6. Mechanical Property Requirements**

6.1 *General*—Deformed wire shall be supplied in coils to the specified mechanical properties in Table 1. Nominal diameters of wire not specifically itemized in this specification may be employed providing that the strength is defined and they conform otherwise to the requirements of this specification.

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

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 01.03.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 01.04.

<sup>4</sup> Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094.