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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Steel Screw Spikes¹

This standard is issued under the fixed designation A 66; 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.

This standard has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

1. Scope

1.1 This specification covers steel screw spikes used as fastenings between railroad rails, tie plates, and ties.

1.2 Supplementary Requirement S1 specifying copper content is provided. It shall apply only when specified by the purchaser.

1.3 The values stated in inch-pound units are to be regarded as the standard.

2. Referenced Documents

2.1 ASTM Standards:

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

2.2 Military Standards:

MIL-STD-129 Marking for Shipment and Storage³

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage³

2.3 Federal Standard:

Federal Standard No. 123 Marking for Shipments (Civil Agencies)³

3. Ordering Information

3.1 Orders for screw spikes under this specification shall include the following information as appropriate:

3.1.1 *Quantity* (weight),

3.1.2 *Style of Head*—A, B, or C⁴ or other, including drawings if necessary,

3.1.3 *Type of Point*—pilot point or not pointed,

3.1.4 *Dimensions*—diameter and length, under head,

3.1.5 *Supplementary Requirement* if to apply (see S1), and

3.1.6 *Certification* (see 11.1).

4. Manufacture

4.1 The steel shall be made by any of the following

processes: open-hearth, electric-furnace, basic-oxygen.

4.2 The steel may be cast by a continuous process, or in ingots.

4.3 The heads and threads of the spikes may be formed by hot- or cold-forming methods.

5. Mechanical Requirements

5.1 Tensile Requirements:

5.1.1 The material as represented by a tension test of a full-size finished spike, or a specimen machined from a finished spike, shall conform to the requirements prescribed in Table 1.

5.1.2 Tension tests of full-size spikes shall be performed using a 10° wedge as described in Test Methods A 370, Supplement S11.1.5.

5.1.3 Where the design of the spike is such that full-size testing is impracticable, the tension test may be made on a specimen machined from a finished spike. Dimensions of the test specimen shall conform to the requirements of Test Methods A 370.

5.1.4 When a machined specimen test is performed, the elongation requirement prescribed in Table 1 shall apply.

5.1.5 The yield point shall be determined by the drop of the beam or halt in the gage of the testing machine.

5.2 *Bend Requirement*—The body of a full-size finished spike shall withstand the bend test described in Table 2 without cracking on the outside of the bent portion.

5.3 Number of Tests:

5.3.1 One tension test and one bend test shall be made from each lot of 100 kegs or fraction thereof.

5.3.2 If, during the test, a previously undiscovered material or manufacturing flaw should be disclosed that interferes with the test or interpretation of results, the substitution of another sample spike shall be permitted after it is demonstrated to the satisfaction of the purchaser or his representative, that the condition is not typical of the remainder of the lot.

6. Dimensions and Permissible Variations

6.1 The finished spikes shall conform to the dimensions specified by the purchaser, subject to the permissible variations prescribed in Table 3.

6.2 The threads shall be sharp and true to gage and of the design specified by the purchaser.

¹ 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 A01.01 on Steel Rails and Accessories.

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² *Annual Book of ASTM Standards*, Vol 01.03.

³ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

⁴ Consult manufacturer's literature for design details for A, B, and C-style heads.

TABLE 1 Tension Test Requirements

	Specimen	
	Full size	Machined
Tensile strength, min, psi (MPa)	60 000 (415)	60 000 (415)
Yield point, min	0.5 × tensile strength	0.5 × tensile strength
Elongation in 2 in. or 50 mm, min, %	...	18

TABLE 2 Bend Test Requirement

Body bend, cold	90°—around pin 3 times spike diameter
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TABLE 3 Permissible Variations in Dimensions

	Over		Under	
	in.	mm	in.	mm
Diameter, unthreaded portion	1/32	0.8
Diameter, threaded portion	1/32	0.8
Reach of head	1/8	3.2	1/16	1.6
Width across flats	0	0.0	1/32	0.8
Length	1/8	3.2	1/8	3.2

7. Workmanship, Finish, and Appearance

7.1 The head of the finished spikes shall be concentric with and firmly joined to the body.

7.2 The material shall be free of injurious imperfections and shall have a workmanlike finish.

8. Number of Tests and Retests

8.1 If the percentage of elongation of a machined tension test specimen is less than that specified in Table 1 and any part of the fracture is more than 3/4 in. (19 mm) from the center of the gage length, as indicated by scribe scratches marked on the specimen before testing, a retest shall be allowed.

8.2 If, during the tension or bend tests, a previously undiscovered material or manufacturing flaw should be disclosed that interferes with the test or the interpretation of results, the substitution of another sample spike shall be permitted after it is demonstrated to the satisfaction of the purchaser or his representative, that the condition is not typical of the remainder of the lot.

9. Inspection

9.1 The manufacturer shall afford the purchaser's inspector all reasonable facilities necessary to satisfy that the material is being produced and furnished in accordance with the specification. Mill inspection by the purchaser shall not interfere unnecessarily with the manufacturer's operations. All tests and inspections shall be made at the place of manufacture, unless otherwise agreed upon.

10. Rejection and Rehearing

10.1 Material that fails to conform to the requirements of this specification may be rejected. Rejections shall be reported to the manufacturer or supplier promptly and in writing. In case of dissatisfaction with the test results, the manufacturer or supplier may make claim for a rehearing.

11. Certification

11.1 When specified in the purchaser order or contract, a manufacturer's certification shall be furnished to the purchaser that the material was produced and tested in accordance with this specification and has been found to meet the requirements.

11.2 When specified in the purchase order or contract, a report of the chemical and mechanical test results shall be furnished.

12. Product Marking

12.1 The manufacturer's symbol shall appear on the head of the spike.

13. U. S. Government Procurement

13.1 When specified in the contract or purchase order, material shall be preserved, packaged and packed in accordance with the requirements of MIL-STD-163. The applicable levels shall be as specified in the contract or order. Marking for shipment of such material shall be in accordance with Fed. Std. No. 123 for civil agencies and MIL-STD-129 for military agencies.

SUPPLEMENTARY REQUIREMENTS

The following supplementary requirement shall apply only when specified by the purchaser in the inquiry, contract, and order.

S1. Copper may be specified to a minimum of 0.20 %.

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