Designation: A 66 – 07

Standard Specification for Steel Screw Spikes[1]

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.

1. Scope*

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

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:* [2]

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

A 700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Shipment

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 C[3] 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)

3.1.6 *Certification and Test Report* (see 11.1).

4. Manufacture

4.1 The steel shall be made by any of the following processes: electric-furnace or 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. If a screw spike is machined and the specimen is tested and reported. the elongation meets or exceeds 18 %, the bend test is not required. See 5.2.

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.

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.

[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 A01.01 on Steel Rails and Accessories.

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

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

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TABLE 1 Tension Test Requirements

	Specimen	
	Full size	Machined
Tensile strength, min, psi (MPa)	60 000 (415)	60 000 (415)
Yield point, min	30 000 (205)	30 000 (250)
Elongation in 2 in. or 50 mm, min, %	....	18

TABLE 2 Bend Test Requirement

Body bend, cold	90°—around pin 3 times spike diameter

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

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

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

8.2 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 ¾ 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.

8.3 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.

8.4 If any test specimen fails because of mechanical reasons such as failure of testing equipment or improper specimen preparation, it may be discarded and another specimen taken.

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 and Test Report

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.

11.3 A Material Test Report, Certificate of Inspection, or similar document printed from or used in electronic form from an electronic data interchange (EDI) transmission shall be regarded as having the same validity as a counterpart printed in the certifier's facility. The content of the EDI transmitted document must meet the requirements of the invoked ASTM standard(s) and conform to any existing EDI agreement between the purchaser and the supplier.

11.4 Notwithstanding the absence of a signature, the organization submitting either a printed document (Material Test Report, Certificate of Inspection or similar document) or an EDI transmission is responsible for the content of the report.

12. Product Marking

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

12.2 *Bar Coding*:

12.2.1 The Automotive Industry Action Group (AIAG) Bar Code Standard for Primary Metals for Steel Products may be considered as a possible auxiliary method of identification on the containers. Use of this method shall be by agreement between purchaser and supplier.

13. U. S. Government Procurement

13.1 When specified in the contract or purchase order, material shall be prepared for shipment and storage in accordance with the requirements of Practices A 700.

14. Keywords

14.1 rails; railway applications; steel screw spikes; track spikes

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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 %. The maximum copper content shall be determined upon mutual agreement between the purchaser and the manufacturer.

SUMMARY OF CHANGES

Committee A01 has identified the loactions of several changes made to this standard since the last edition (A 66 – 01). Approved May 2007.

(1) Deleted references to S1 in the Scope
(2) Clarified 5.1.4
(3) Revised Table 1.
(4) Changed wording of S1.

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