



Designation: A3 – 01 (Reapproved 2006)

# Standard Specification for Steel Joint Bars, Low, Medium, and High Carbon (Non-Heat-Treated)<sup>1</sup>

This standard is issued under the fixed designation A3; 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.

*This standard has been approved for use by agencies of the Department of Defense.*

## 1. Scope

1.1 This specification covers steel joint bars for connecting steel rails in mine, industrial, and standard railroad track.

1.2 Three grades of joint bars are defined for applications where non-heat treated bars are suitable:

1.2.1 Grade 1, low-carbon, primarily for industrial and mine use.

1.2.2 Grade 2, medium-carbon, primarily for industrial and mine use.

1.2.3 Grade 3, high-carbon, for general use in standard railroad track. They may be used in the production of insulated track joints.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

## 2. Referenced Documents

2.1 *ASTM Standards*:<sup>2</sup>

A370 Test Methods and Definitions for Mechanical Testing of Steel Products

A700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Shipment

## 3. Ordering Information

3.1 Orders for joint bars under this specification shall include the following information as appropriate:

3.1.1 *Quantity*—number of pairs of bars,

3.1.2 *Type*—design or type bar along with section designation and weight of rails being joined,

3.1.3 *Grade*—in accordance with 1.2 and Table 1 and Table 2,

3.1.4 *Dimension*—overall length,

<sup>1</sup> 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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<sup>2</sup> 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.

TABLE 1 Chemical Requirements

Elements	Composition, %		
	Grade 1	Grade 2	Grade 3
Carbon, min	...	0.30	0.45
Phosphorus, max	0.05	0.05	0.04

TABLE 2 Product Analysis

	Allowance Beyond Limits of Specified Chemical Analysis	
	Percent under min limit	Percent over max limit
Carbon	0.04	0.04
Phosphorus	...	0.008

3.1.5 *Punching*—type (elliptical, oval, round, or combinations), size, number, location, spacing, and elevation of punched holes, with dimensional drawing if necessary,

3.1.6 *Special Requirements*—notching, shearing, bundling, etc., including details, and

3.1.7 *Certification and Test Report Requirements*—(Section 11).

## 4. Manufacture

4.1 The steel shall be made by one or both of the following processes: basic-oxygen or electric-furnace.

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

4.2 Grade 2, medium-carbon, joint bars may be punched, slotted, and shaped in the case of special designs, either hot or cold. Joint bars that are punched, slotted, or shaped cold shall be subsequently annealed.

4.3 Grade 3, high-carbon, joint bars shall be uniformly heated for punching, slotting, and shaping.

## 5. Chemical Requirements

5.1 The steel shall conform to the requirements as to chemical composition prescribed in Table 1.

5.2 *Heat or Cast Analysis*—An analysis of each heat or cast shall be made by the manufacturer to determine the percentages of carbon, manganese, phosphorus, and sulfur. The