



Designation: A 739 – 90a (Reapproved 2000)

# Standard Specification for Steel Bars, Alloy, Hot-Wrought, for Elevated Temperature or Pressure-Containing Parts, or Both<sup>1</sup>

This standard is issued under the fixed designation A 739; 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<sup>2</sup> covers hot-wrought, ferritic alloy steel bars for elevated temperature or pressure-containing parts suitable for fusion welding or both.

1.2 The bars are furnished in the following grades:

Grade B 11: 1.25 % chromium, 0.55 % molybdenum

Grade B 22: 2.25 % chromium, 1.00 % molybdenum

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*:

A 29/A 29M Specification for Steel Bars, Carbon and Alloy, Hot-Wrought and Cold-Finished, General Requirements for<sup>3</sup>

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products<sup>4</sup>

## 3. Ordering Information

3.1 Orders for material under this specification should include the following information:

3.1.1 Quantity (weight or number of pieces),

3.1.2 Name of material (ferritic alloy steel bars),

3.1.3 Condition (hot wrought, normalized and tempered, machine straightened and descaled),

3.1.4 Dimensions (cross-sectional shape, size, and length),

3.1.5 ASTM designation and date of issue,

3.1.6 Grade (Table 1),

3.1.7 Additions to the specification, and

3.1.8 End use.

<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 A01.15 on Bars.

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<sup>2</sup> For ASME Boiler and Pressure Vessel Code applications see related Specification SA-739 in Section II of that code.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 01.05.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 01.03.

TABLE 1 Chemical Requirements

Element	Composition, %	
	Grade B 11	Grade B 22
Carbon, max	0.05–0.20	0.05–0.15
Manganese	0.40–0.65	0.30–0.60
Phosphorus, max	0.035	0.035
Sulfur, max	0.040	0.040
Silicon	0.50–0.80	0.50 max
Chromium	1.00–1.50	2.00–2.50
Molybdenum	0.45–0.65	0.90–1.10

NOTE 1—A typical description is as follows: 10 000 lb, Ferritic Alloy Steel Bars, Hot Wrought Normalized and Tempered, and Descaled, 1.000-in. diameter by 10 ft, ASTM A 739 dated\_\_\_\_, Grade B 11, Special Straightened, Special Machined Fittings.

## 4. Materials and Manufacture

4.1 *Melting Practice*—The steel shall be made by one or more of the following primary processes: open-hearth, basic-oxygen, or electric-furnace. The primary melting may incorporate separate degassing or refining and may be followed by secondary melting using electroslag remelting or vacuum arc remelting. Where secondary melting is employed, the heat shall be defined as all of the ingots remelted from a single primary heat.

4.2 *Condition*—Unless otherwise specified, bars shall be hot wrought, heat treated, and descaled.

4.3 *Heat Treatment*:

4.3.1 The bars shall be normalized and tempered.

4.3.2 Austenitizing temperature shall be within the range from 1700 to 1800°F (927 to 982°C).

4.3.3 Cooling from the austenitizing temperature may be accomplished by cooling in still air or moving air, at the producer's option. When permitted by the purchaser, cooling from the austenitizing temperature may be accelerated by spray or liquid quenching.

4.3.4 The minimum tempering temperature shall be 1200°F (649°C) for Grade B 11 and 1250°F (677°C) for Grade B 22.

## 5. Chemical Composition

5.1 The heat analysis shall conform to the limits for chemical composition specified in Table 1 for the grade ordered.