



Designation: A290/A290M – 05(Reapproved 2010)

Standard Specification for Carbon and Alloy Steel Forgings for Rings for Reduction Gears¹

This standard is issued under the fixed designation A290/A290M; 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.

1. Scope

1.1 This specification covers normalized and tempered, and quenched and tempered, carbon and alloy steel forged or rolled rings for reduction gears.

1.2 Several grades and classes of steel are covered as follows:

1.2.1 Grade 1, Classes A and B, and Grade 2, Classes C and D, are carbon steel.

1.2.2 Grade 3, Classes E and F, Grade 4, Classes G, H, I, J, K and L, Grade 5, Classes M and P, and Grade 6, Class T, are alloy steel.

1.2.3 All grades and classes are considered weldable under proper conditions. Welding techniques are of fundamental importance and it is pre-supposed that welding procedure and inspection will be in accordance with proper methods for the class of material used.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

2. Referenced Documents

2.1 *ASTM Standards*:²

[A275/A275M Practice for Magnetic Particle Examination of Steel Forgings](#)

[A370 Test Methods and Definitions for Mechanical Testing of Steel Products](#)

[A388/A388M Practice for Ultrasonic Examination of Steel Forgings](#)

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 A01.06 on Steel Forgings and Billets.

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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.

[A788/A788M Specification for Steel Forgings, General Requirements](#)

3. Terminology

3.1 Definitions of the terms used may be found in Specification [A788/A788M](#).

4. Ordering Information and General Requirements

4.1 In addition to the ordering information required by Specification [A788/A788M](#), the purchaser shall specify in the inquiry, contract, and order the grade and class desired and the supplementary requirements, if any, which should apply.

4.2 Material supplied to this specification shall conform to the requirements of Specification [A788/A788M](#), which outlines additional ordering information, manufacturing requirements, testing and retesting methods and procedures, marking, certification, product analysis variations, and additional supplementary requirements.

5. Materials and Manufacture

5.1 *Melting Process*:³ [32cb/astm-a290-a290m-052010](#)

5.1.1 The steel shall be produced by any of the melting requirements in Specification [A788/A788M](#), which may be supplemented by Supplementary Requirement S6, Vacuum Degassing.

5.2 *Discard*—Sufficient discard shall be taken from each ingot to secure freedom from piping and undue segregation.

5.3 *Forging Process*—The forgings shall receive their hot mechanical work in accordance with the requirements of Specification [A788/A788M](#).

5.4 *Heat Treatment*:

5.4.1 *Cooling Prior to Heat Treatment*—After forging and before reheating for heat treatment, the forgings shall be allowed to cool in a manner to prevent injury, to accomplish transformation, and prevent flakes.

5.4.2 Heat treatment shall consist of normalizing and tempering for Grade 1 classes A and B and quenching and tempering for all other grades and classes.

5.4.2.1 *Normalizing*—A furnace charge thus treated is termed a normalizing charge.

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