



AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5335B

Superseding AMS 5335A

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STEEL CASTINGS, SAND

0.65Cr - 0.75Ni - 0.20Mo (0.25 - 0.33C) (SAE 8630 Modified)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. APPLICATION: Primarily for parts requiring higher strength than cast carbon steel and which may be heat treated or welded.
3. COMPOSITION:

	min	max
Ø Carbon	0.25	0.33
Manganese	0.60	0.95
Silicon	0.50	0.90
Phosphorus	--	0.025
Sulfur	--	0.025
Chromium	0.40	0.90
Nickel	0.40	1.10
Molybdenum	0.15	0.25
Copper	--	0.35

4. CONDITION: Normalized and tempered, unless otherwise specified.

5. TECHNICAL REQUIREMENTS:

- 5.1 Heat Treatment: Castings shall be normalized by heating to 1700 - 1750 F (926.7 - 954.4 C), holding at heat for not less than 1 hr per inch of maximum section but in no case less than 1 hr, and cooling in air. They shall then be tempered by heating to a temperature not lower than 1150 F (621 C), holding at heat for not less than 1 hr, and cooling in air.
- 5.2 Hardness: Castings shall have hardness of Brinell 183 - 229 or equivalent.
- 5.3 Tensile Properties: When specified on the drawing or when agreed upon by purchaser and vendor, tensile test specimens shall be machined from castings selected at random from the shipment. Size and location of such specimens and required properties shall be as shown on the drawing or as agreed upon by purchaser and vendor.
- 5.4 Resampling and Retesting: In the event any test specimen fails to meet the specified requirements, at least two additional test specimens shall be tested for each non-conforming specimen. All such additional specimens shall conform to specified requirements. Failure of any retest specimen to conform to specified requirements shall be cause for rejection of the castings from that shipment. Results of all tests shall be reported.

6. QUALITY:

- 6.1 Castings shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts. Castings shall have smooth surfaces and shall be well cleaned.

- 6.2 When castings are broken for fracture test, the fracture shall have uniform color and be substantially free from oxides and other imperfections.
- 6.3 Unless otherwise specified, castings shall be produced under radiographic control. This shall consist of radiographic examination of castings until proper foundry technique, which will produce castings free from harmful internal imperfections, is established for each part number and of production castings as necessary to ensure maintenance of satisfactory quality.
- 6.4 Radiographic and other quality standards shall be as agreed upon by purchaser and vendor.
- 6.5 Castings shall not be repaired by plugging, welding, or other methods without written permission from purchaser.

7. REPORTS:

- 7.1 Unless otherwise specified, the vendor of castings shall furnish with each shipment three copies of a report of the results of tests for chemical composition of each heat represented and a statement that the heat treatment has been performed in accordance with the requirements of this specification. When properties of test specimens cut from castings are specified, the report shall include the results of tests to determine conformance to such requirements. This report shall include the purchase order number, heat number, material specification number and its revision letter, part number, and quantity from each heat.
- 7.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number and its revision letter, contractor or other direct supplier of castings, part number, and quantity. When castings for making parts are produced or purchased by the parts vendor, that vendor shall inspect each lot of castings to determine conformance to the requirements of this specification, and shall include in the report a statement that the castings conform, or shall include copies of laboratory reports showing the results of tests to determine conformance.

8. IDENTIFICATION: Unless otherwise specified, castings shall be identified in accordance with the latest issue of AMS 2804.

9. APPROVAL:

- 9.1 Sample castings from new or reworked patterns and the casting procedure shall be approved by purchaser before castings for production use are supplied; unless such approval be waived.
- 9.2 Vendor shall establish for production of sample castings of each part number the control factors of processing which will produce acceptable castings; this shall constitute the approved casting procedure and shall be used for producing production castings. If necessary to make any change in control factors of processing which could affect quality or properties of the castings, vendor shall submit for reapproval a detailed statement of the revised operations and, when requested, sample castings. No production castings incorporating the revised operations shall be shipped prior to receipt of reapproval.

- 9.2.1 Control factors for producing castings include, but are not limited to the following:

Type of furnace and its capacity
Size of furnace charge
Furnace atmosphere
Fluxing or deoxidation procedure
Variations of more than ± 50 F (± 28 C) in pouring temperature
Solidification rate and subsequent cooling procedures
Cleaning operations
Methods of routine inspection