AERONAUTICAL
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 2310

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Revised

TRANSVERSE STRENGTH AND DUCTILITY REQUIREMENTS FOR STEEL
Tensile Strength 260,000 psi, min

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily for parts and structures subject to severe transverse service requirements, fabricated from steels capable of being hardened to a minimum tensile strength of 260,000 psi.

3. TECHNICAL REQUIREMENTS:

3.1 Material: Shall conform to the requirements of this specification in addition to those of applicable material specification for the steel specified.

3.2 Heat Treatment: Unless otherwise specified, test specimens obtained from the billets or bars, shall be heat treated in a manner compatible with the type of steel ordered.

3.3 Transverse Tensile Properties: Shall conform to the following requirements after heat treatment as in 3.2:

Cross Sectional Area Sq In.	Tensile Strength psi	Reduction of Area, %	
		Average	Minimum
100 or less	260,000 - 280,000	15	6
Over 100	260,000 - 280,000	10	6

3.4 Inspection and Testing:

3.4.1 Heat Examination:

3.4.1.1 In a heat where all the billets or bars produced have average cross sectional areas all over or all under 100 sq in., specimens shall be tested from one end of billets or bars representing the top and bottom of the first, middle, and last ingots from the heat.

3.4.1.2 In a heat where some of the billets or bars produced have an average cross sectional area over 100 sq in. and some have average cross sectional areas under 100 sq in., specimens shall be tested from the end of billets or bars representing the top and bottom of the first and last ingots used to produce each size range.

3.4.2 Ingot Examination: (Additional examination of ingots is not necessary, if ingots are from qualified heat.)

3.4.2.1 When ingots are to be qualified and the sequence of pouring from the heat is not known, specimens shall be tested from one end of the billets or bars representing the top and bottom of each ingot selected.

3.4.2.2 When three or more ingots of a given heat are to be qualified and the pouring sequence is known, the following procedures shall be used:

3.4.2.2.1 When 10 ingots or less are to be examined, specimens shall be tested from one end of billets or bars representing the top and bottom of the first ingot poured and last ingot poured of the ingots to be qualified.

3.4.2.2.2 When more than 10 ingots are to be examined, specimens shall be tested from one end of billets or bars representing the top and bottom of the first, middle, and last ingots poured of the ingots to be qualified.

3.4.3 Billet or Bar Examination: (Additional examination of billets and bars is not required if heat or ingot from which billets or bars are produced has been previously qualified.)

3.4.3.1 Specimens shall be tested from both ends of each billet or bar.

3.4.4 Preparation of Specimens:

3.4.4.1 A full transverse cross sectional specimen having a minimum thickness of 3/4 in. shall be cut from the billet or bar, as required for qualification of heat, ingot, or individual billets or bars. Unless otherwise specified, the specimen shall be taken from the billet or bar having a minimum cross section of 5 in. or over. When billets or bars have a minimum cross sectional dimension under 5 in., the specimen shall be cut from the parent product (i.e., when billets or bars are to be reduced to below 5 in., specimens shall be cut from billet or bar before final reduction and while it has minimum dimensions of 5 in. or greater). Each specimen shall be identified with its location in the ingot, ingot number, and ingot position in the heat.

3.4.4.2 When permitted, the test coupons may be obtained from a billet or bar that has been reduced by forging an amount agreed upon by purchaser and vendor.

3.4.4.3 From the mid-radius of each cross section, two 0.505 in. diameter tensile test specimens shall be taken in the transverse direction from round or square stock and in the short direction from rectangular stock (see Fig. 1). Subsize specimens may be used if the size of the cross section does not permit the larger test specimen.

3.5 Re-Test:

3.5.1 Heat Consisting of Three or More Ingots Where Pouring Sequence is Known: If a specimen from any single cross section does not meet the requirements of 3.3, an additional cross section shall be cut from each of the two ingots closest in the pouring sequence to that of the failed ingot. Specimens shall be machined from these cross sections and tested in the same manner as the initial test. If the results of re-test meet the specified requirements, the material, except billets and bars from the ingot that failed initial qualification test, shall be accepted. The failed ingot may be cropped and retested in accordance with the procedure for examination of individual ingots, 3.4.2.1, and accepted if it meets the minimum requirements of 3.3. If re-test is satisfactory as a result of additional cropping, all ingots in the heat shall be cropped the same amount unless the two ingots closest in the pouring sequence to the failed ingot have been examined and the properties of the specimens cut from the two ingots meet the minimum requirements specified.

3.5.2 Ingots Not From a Qualified Heat or Pouring Sequence is Not Known: If a specimen fails to meet the properties specified in 3.3, one additional cross section shall be taken from the opposite end of the billet or bar previously tested and a specimen prepared and tested in the manner prescribed for the initial test. If properties obtained in the re-test meet specified requirements, the remaining portion of the ingot shall be considered acceptable and the tested billet or bar shall be discarded.

3.5.3 Billets or Bars Not From Qualified Heat or Ingot: No re-testing is permitted.

4. REPORTS:

4.1 Unless otherwise specified, the vendor of the product shall include in the report required with each shipment of the product the results of tests on each size from each heat to determine conformance to the technical requirements of this specification and a statement of specific heat treating temperatures and cycles used to provide reported tensile properties. The results of the mechanical properties of each specimen shall be identified with the cross section from which the specimen was obtained and the cross section location in the ingot, ingot number, and ingot position in the heat.

4.2 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, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

5. IDENTIFICATION:

5.1 Bars, Billets, and Forging Stock: In addition to the identification required in the applicable material specification, the material shall be stamped "Special Quality, AMS 2310", within 2 in. of one end.

6. REJECTIONS: Material not conforming to this specification or to authorized modifications will be subject to rejection.