

 SURFACE VEHICLE STANDARD	 J404 JAN2009
	Issued 1911-06 Revised 2009-01
	Superseding J404 JUN2000
Chemical Compositions of SAE Alloy Steels	

RATIONALE

Scope – Deleted reference to SAE J404 not being applicable to certain product forms.

Table 1 – Revised table title and column headings. Fixed errors in table for following grades: 50B46 – added Chromium range, 8615 – revised Carbon range. Added new grade of 52100. Revised Footnotes and added Footnotes 4, 6 and 7.

1. SCOPE

In 1941, the SAE Iron and Steel Division in collaboration with the American Iron and Steel Institute (AISI) made a major change in the method of expressing composition ranges for the SAE steels. The plan, as now applied, is based in general on narrower ladle analysis ranges plus certain product (check) analysis allowances on individual samples, in place of the fixed ranges and limits without tolerances formerly provided for carbon and other elements in SAE steels (reference SAE J408).

ISTC Division 1 has developed a procedure which allows for the maintenance of the grade list in this SAE Standard. This will involve conducting an industry-wide survey to solicit input. This survey will be conducted at a frequency deemed necessary by the technical committee. Criteria have been established for the addition to or deletion of grades from the grade table. A new grade will be considered if it meets standard SAE grade ranges, has a minimum usage or production of 225 tonnes/year (250 tons/year), and has the endorsement of at least two users or producers. New steel compositions will still be considered as Potential Standard (PS) steels, based on the guidelines provided in SAE J1081, until such time as production of the new steel achieves a level of production or usage qualifying it for consideration as a standard steel.

The deletion of a grade from the grade table will be by consensus based on the grade survey results. Deleted grades will be archived in SAE J1249 for future reference.

The compositions in this document may apply to open hearth and basic oxygen, or electric furnace steels. Grades shown in Table 1 with prefix letter E are normally made by the electric furnace process with maximum limits of 0.025% phosphorus and 0.025% sulfur. The nominal chemical limits or ranges in the compositions given in Table 1 are subject to standard variations in check analysis given in SAE J409. Since AISI is no longer issuing steel grade designations, all grades listed in this document are SAE grades.

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2. REFERENCES

2.1 Applicable Publications

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J408 Methods of Sampling Steel for Chemical Analysis

SAE J409 Product Analysis—Permissible Variations from Specified Chemical Analysis of a Heat or Cast of Steel

SAE J1081 Potential Standard Steels

SAE J1249 Former SAE Standard and Former SAE Ex-Steels

SAE J1268 Hardenability Bands for Carbon and Alloy H Steels

SAE J1868 Restricted Hardenability Bands for Selected Alloy Steels

SAE Aerospace Material Specifications (AMS) Index

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM A 506 Specification for Steel Sheet and Strip, Alloy, Hot-Rolled and Cold-Rolled, Regular Quality

ASTM A 507 Specification for Steel Sheet and Strip, Alloy, Hot-Rolled and Cold-Rolled, Drawing Quality

ASTM A 513 Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing

ASTM A 519 Specification for Seamless Carbon and Alloy Steel Mechanical Tubing

3. CROSS INDEX TO EQUIVALENT GRADES AND GOVERNMENT SPECIFICATIONS

Attention is called to the SAE Aerospace Material Specifications (AMS) Index which is published twice a year. This index gives a cross reference to AMS grades, SAE grades, AISI grades, and Government Specifications (MIL, QQS, and so on) for metals, alloys, and nonmetallic materials.