AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS5626A

Issued 5-1-48
Revised 6-1-51

STEEL, HIGH SPEED
18W - 4Cr - 1V

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

2. FORM: Bars, forgings, and forging stock.

3. APPLICATION: Primarily for parts requiring high strength and hardness, but not high oxidation resistance, at temperatures up to 900 F, or where high density is important.

4. COMPOSITION:

Carbon	0.68 - 0.75
Manganese	0.10 - 0.40
Silicon	0.10 - 0.40
Phosphorus	0.030 max
Sulfur	0.030 max
Chromium	3.75 - 4.50
Molybdenum	1.00 max
Tungsten	17.50 - 18.75
Vanadium	0.90 - 1.25

5. CONDITION:

5.1 Bars: Fully annealed having hardness not higher than Brinell 248 or equivalent, unless otherwise specified. Bars 3 in. and under in diameter or distance between parallel sides shall be cold finished.

5.2 Forgings: As ordered.

5.3 Forging Stock: As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENTS:

6.1 Decarburization:

6.1.1 Bars ordered ground, turned, or polished shall be free from decarburization.

6.1.2 Allowable decarburization of bars ordered for redrawing or forging, or to specified microstructural requirements, shall be as agreed upon by purchaser and vendor.

6.1.3 Decarburization of bars to which 6.1.1 or 6.1.2 above is not applicable shall be not greater than the following:

Nominal Diameter or Distance Between Parallel Sides, Inches	Maximum Depth of Decarburization Inch
0.500 and under	0.010
Over 0.500 to 1.000, incl	0.020
Over 1.000 to 2.500, incl	0.030
Over 2.500 to 4.000, incl	0.047
Over 4.000	0.063

6.1.4 Unless otherwise agreed upon by purchaser and vendor, decarburization shall be measured by the microscopic method, or by Rockwell Superficial 30N scale hardness method, or equivalent hardness testing method, on hardened specimens. Depth of decarburization, when measured by a hardness method, is defined as the distance measured from the nearest original surface to the point at which no increase in hardness is found.

7. QUALITY: Material shall be uniform in quality and condition, clean, sound, and and free from foreign materials and from internal and external defects detrimental to fabrication or to performance of parts.

8. TOLERANCES:

8.1 Hot Finished:

8.1.1 Rounds, Squares, Hexagons and Octagons:

Nominal Diameter or Distance Between Parallel Sides, Inches	Tolerance, Inch plus	Tolerance, Inch minus	Out of Section inch, max
0.5 and under	0.012	0.005	0.010
Over 0.5 to 1.0, incl	0.016	0.010	0.013
Over 1.0 to 1.5, incl	0.020	0.012	0.018
Over 1.5 to 2.0, incl	0.025	0.015	0.021
Over 2.0 to 2.5, incl	0.030	0.020	0.025
Over 2.5 to 3.0, incl	0.040	0.020	0.030
Over 3.0 to 4.0, incl	0.050	0.025	0.035
Over 4.0 to 5.0, incl	0.060	0.025	0.035

8.1.2 Flats, Thickness:

Nominal Width Inches	Thickness Tolerance, Inch Thickness Ranges, Inches							
	0.25 and under		Over 0.25 to 0.50, incl		Over 0.50 to 1.0, incl		Over 1.0 to 2.0, incl	
	plus	minus	plus	minus	plus	minus	plus	minus
1.0 and under	0.010	0.006	0.012	0.008	0.016	0.010	0.020	0.020
Over 1.0 to 2.0, incl	0.014	0.006	0.016	0.008	0.020	0.010	0.024	0.020
Over 2.0 to 3.0, incl	0.018	0.006	0.020	0.008	0.024	0.010	0.027	0.020
Over 3.0 to 4.0, incl	0.020	0.008	0.022	0.010	0.024	0.013	0.030	0.024
Over 4.0 to 5.0, incl	0.020	0.010	0.024	0.012	0.030	0.015	0.035	0.027
Over 5.0 to 6.0, incl	0.020	0.012	0.030	0.014	0.030	0.018	0.035	0.030

8.1.3 Flats, Width:

Nominal Width Inches	Tolerance, Inch	
	plus	minus
1.0 and under	1/32	1/64
Over 1.0 to 3.0, incl	3/64	1/32
Over 3.0 to 5.0, incl	1/16	3/64
Over 5.0	3/32	1/16

8.2 Turned:

Nominal Diameter Inches	Tolerance, Inch Plus only
Under 4.0	0.015

8.3 Cold Finished: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2251, Table I, column headed "over 0.55 or All Carbons Heat Treated".

8.4 Centerless Ground:

Nominal Diameter Inches	Tolerance, Inch Plus and Minus
Under 0.5	0.0015
0.5 and over	0.002