

# AERONAUTICAL MATERIAL SPECIFICATION

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

## AMS 5223

Issued 8-15-55

Revised

### ALLOY STRIP

Iron Base - 5.2Cr - 4.2Ni - 2.3Ti - 0.5Al

Cold Rolled, 10% Reduction

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. APPLICATION: Primarily for diaphragms, leaf springs, and helical springs, requiring a precipitation-hardening alloy with a coefficient of modulus of elasticity of  $-20$  to  $+20 \times 10^{-6}$  per deg Fahr from  $-50$  to  $+150$  F, after suitable heat treatment.

3. COMPOSITION:

Carbon	0.06 max
Manganese	0.8 max
Silicon	1.0 max
Phosphorus	0.04 max
Sulfur	0.04 max
Chromium	4.9 - 5.5
Nickel + Cobalt	41.0 - 43.0
Cobalt, if determined	1.0 max
Titanium	2.2 - 2.6
Aluminum	0.30 - 0.8
Iron	remainder

4. CONDITION: Solution heat treated and cold rolled with approximately 10% reduction in thickness.

5. TECHNICAL REQUIREMENTS:

- 5.1 Tensile Properties:

Tensile Strength, psi	90,000 - 110,000
Elongation, % in 2 in.	15 min

- 5.2 Hardness: Shall be Rockwell B 83-98 or equivalent.

- 5.3 Properties After Precipitation Heat Treatment: Material 0.020 to 0.250 in., incl, in thickness shall be capable of meeting the following requirements after being heated to  $1350 \text{ F} \pm 15$ , held at heat for 3 hr, and cooled in air. Properties of material of other thickness shall be as agreed upon by purchaser and vendor.

- 5.3.1 Tensile Properties:

Tensile Strength, psi	165,000 min
Yield Strength at 0.2% Offset or at 0.0132 in. in 2 in. Extension Under Load ( $E = 26,000,000$ ), psi	120,000 min
Elongation, % in 2 in.	10 min

- 5.3.2 Hardness: Shall be Rockwell C 34-41 or equivalent.

Section 7C of the SAE Technical Board rules provides that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

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

7. TOLERANCES: Unless otherwise specified, the following tolerances shall apply:

7.1 Thickness:

Nominal Thickness (T) Inch	Thickness Tolerance, Inch, Plus and Minus Width Ranges, Inches		
	3.00 and under	Over 3.00 to 4.00, incl	Over 4.00 to 5.00, incl
0.005 and under	0.0005	---	---
Over 0.005 to 0.015, incl	0.0005	0.0005	---
Over 0.015 to 0.025, incl	0.00075	0.00075	---
Over 0.025 to 0.040, incl	0.001	0.001	0.001
Over 0.040	0.025xT	0.025xT	0.025xT

7.1.1 When premium tolerances are specified on the purchase order, material shall conform to the following:

Nominal Thickness (T) Inch	Thickness Tolerance, Inch, Plus and Minus Width Ranges, Inches		
	3.00 and under	Over 3.00 to 4.00, incl	Over 4.00 to 5.00, incl
0.005 and under	0.0002	---	---
Over 0.005 to 0.010, incl	0.0003	0.0003	---
Over 0.010 to 0.015, incl	0.0004	0.0004	---
Over 0.015 to 0.025, incl	0.0005	0.0005	---
Over 0.025	0.02xT	0.02xT	0.02xT

7.2 Width:

Nominal Width Inches	Width Tolerance, Inch					
	Thickness Ranges, Inch					
	Over 0.005 and under	Over 0.005 to 0.010, incl	Over 0.010 to 0.025, incl	Over 0.025 to 0.040, incl	Over 0.040 to 0.075, incl	Over 0.075
3.00 and under	+0.010 -0.000	---	---	---	---	---
Over 3.00 to 4.00, incl	---	+0.010 -0.000	+0.012 -0.000	---	---	---
Over 4.00 to 5.00, incl	---	---	---	+0.015 -0.000	+0.015 -0.005	+0.015 -0.015