

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5225

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Revised

ALLOY STRIP

Iron Base - 5.2Cr - 4.2Ni - 2.3Ti - 0.5Al
Cold Rolled, 50% 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 50% reduction in thickness.

5. TECHNICAL REQUIREMENTS:

- 5.1 Tensile Properties:

| | |
|------------------------|-------------------|
| Tensile Strength, psi | 125,000 - 140,000 |
| Elongation, % in 2 in. | 3 min |

- 5.2 Hardness: Shall be Rockwell C 24-32 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 | 190,000 min |
| Yield Strength at 0.2% Offset or at 0.0162 in. in 2 in. Extension Under Load ($E = 27,000,000$), psi | 165,000 min |
| Elongation, % in 2 in. | 5 min |

- 5.3.2 Hardness: Shall be Rockwell C 39-46 or equivalent.

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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 | | | | | |
|----------------------------|---|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------|
| | 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 |