

AERONAUTICAL MATERIAL SPECIFICATION

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Revised

STEEL, HIGH EXPANSION 12.5Ni - 4.5Mn - 4.0Cr (.50 - .60C)

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. **FORM:** Cold-finished rods and bars up to 1 inch in diameter or distance between parallel sides.
3. **APPLICATION:** Primarily bolts and screws requiring a coefficient of expansion similar to that of aluminum alloys. This steel is hardenable only by cold working.
4. **COMPOSITION:**

		Check Analysis	
		Under	Min or Over Max
Carbon	0.50 - 0.60	0.02	0.02
Manganese	3.50 - 5.50	0.04	0.04
Silicon	0.50 max	--	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	3.00 - 5.00	0.10	0.10
Nickel	11.00 - 14.00	0.15	0.15
Molybdenum	0.50 max	--	0.03

5. **CONDITION:** Cold finished.
6. **TECHNICAL REQUIREMENTS:**
 - 6.1 **Hardness:** Rods and bars shall have hardness of Brinell 269-352 or equivalent.
 - 6.2 **Coefficient of Thermal Expansion:** Rods and bars shall be capable of showing a coefficient of thermal expansion not lower than 12.0×10^{-6} per degree Fahrenheit over the temperature range 72-600 F.
7. **QUALITY:** Material shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external defects detrimental to fabrication or to performance of parts.
8. **TOLERANCES:** Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2241 as applicable to cold finished.
9. **REPORTS:**
 - 9.1 Unless otherwise specified, the vendor of bars shall furnish with each shipment three copies of a notarized report of the results of tests for chemical composition of each heat in the shipment. This report shall include the purchase order number, heat number, material specification number, size, and quantity from each heat.

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