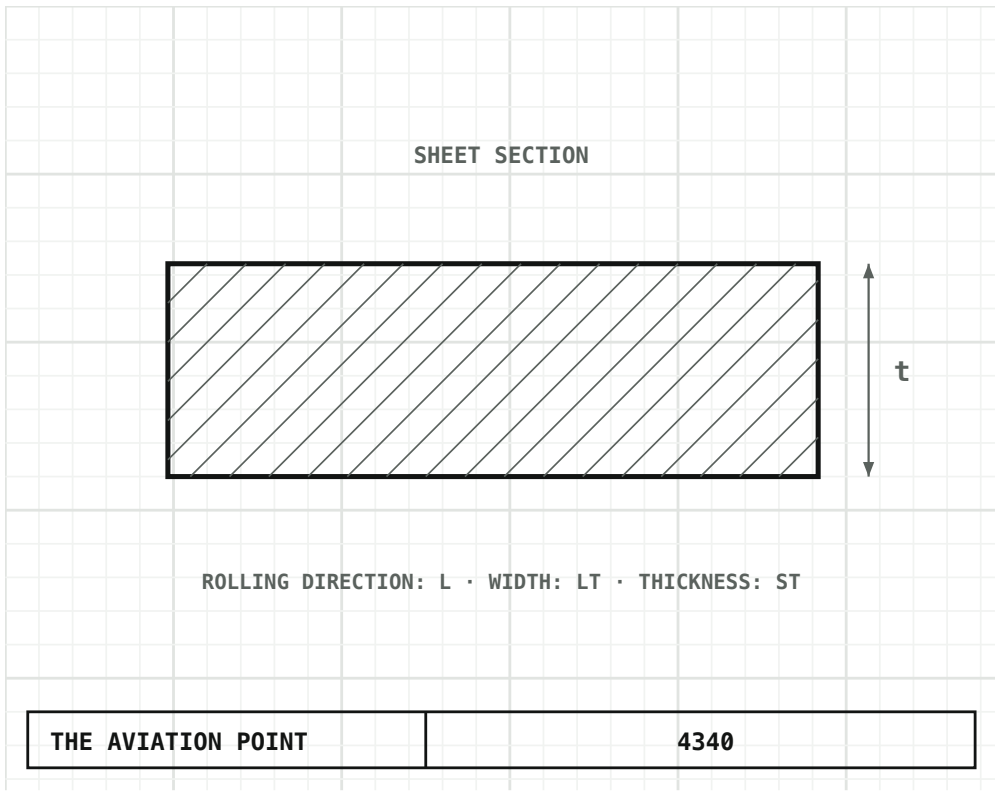
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4340 — alloy steel

The deep-hardening high-strength steel for forgings and bars at 260 ksi and up.



Schematic

Designation

Item	Value
Designation	4340
Class	Steel and stainless
Type	alloy steel

Composition

Item	Limit	Source
Composition	Nickel 1.65-2.00 %, chromium 0.70-0.90 %, molybdenum 0.20-0.30 %, carbon about 0.40 %	AZoM AISI 4340 composition table

Properties

Property	Value	Source
Against 4140	Heat treated in thicker sections and to higher strength levels	MIL-HDBK-5J, par. 2.3.1.0
Bars, forgings, tubing (consumable electrode melted)	AMS 6414	MIL-HDBK-5J, Table 2.3.1.0(b)
Sheet, strip, plate	AMS 6454 (consumable electrode), AMS 6359 (air melted); neither lists minimum properties	MIL-HDBK-5J, Tables 2.3.1.0(a) and (b)
Bars and forgings (air melted)	AMS-S-5000, AMS 6415	MIL-HDBK-5J, Table 2.3.1.0(a)
Strength levels used	Ftu = 260 ksi or higher; not used at 220 ksi	MIL-HDBK-5J, par. 2.3.1.0
Tempering trap	Embrittlement when tempered in the range 500 to 700 °F	MIL-HDBK-5J, par. 2.3.1.0

Design allowables — AISI 4340, quenched and tempered

Property	S basis	Unit
Ftu	260	ksi
Fty	217	ksi
Fcy	235	ksi
Fsu	156	ksi
Elongation, L (S basis)	10	%
Specification	AMS 6414	—

Applicable to consumable-electrode vacuum-melted material only (footnote a), and only to parts for which the Ftu has been substantiated by quality control testing (footnote b). The maximum section depends on the quench; the table's footnotes give it for oil, salt and water. Source: MIL-HDBK-5J (31 Jan 2003), Table 2.3.1.0(f1), p. 2-22. E = 29.0×10^3 ksi and density 0.283 lb/in^3 are printed for the low-alloy steels in Table 2.3.1.0(c1).

Notes

- **Vacuum-melted values only.** They do not apply to air-melted material.
- **Not a repair stock.** Replacement of a 4340 part is by part number, not by a bar from a catalog.
- **No welding or hand-sanding advice.** Corrosion and cracks go to engineering.

SOURCES · MIL-HDBK-5J, Metallic Materials and Elements for Aerospace Vehicle Structures · FAA AC 43.13-1B CHG 1 · MMPDS · AZoM, AISI 4340 alloy steel

SCAN · OPEN THIS DATA SHEET
theaviationpoint.com/parts/materials/4340/

Reference data. The aircraft manufacturer's documentation (SRM / IPC) takes precedence.