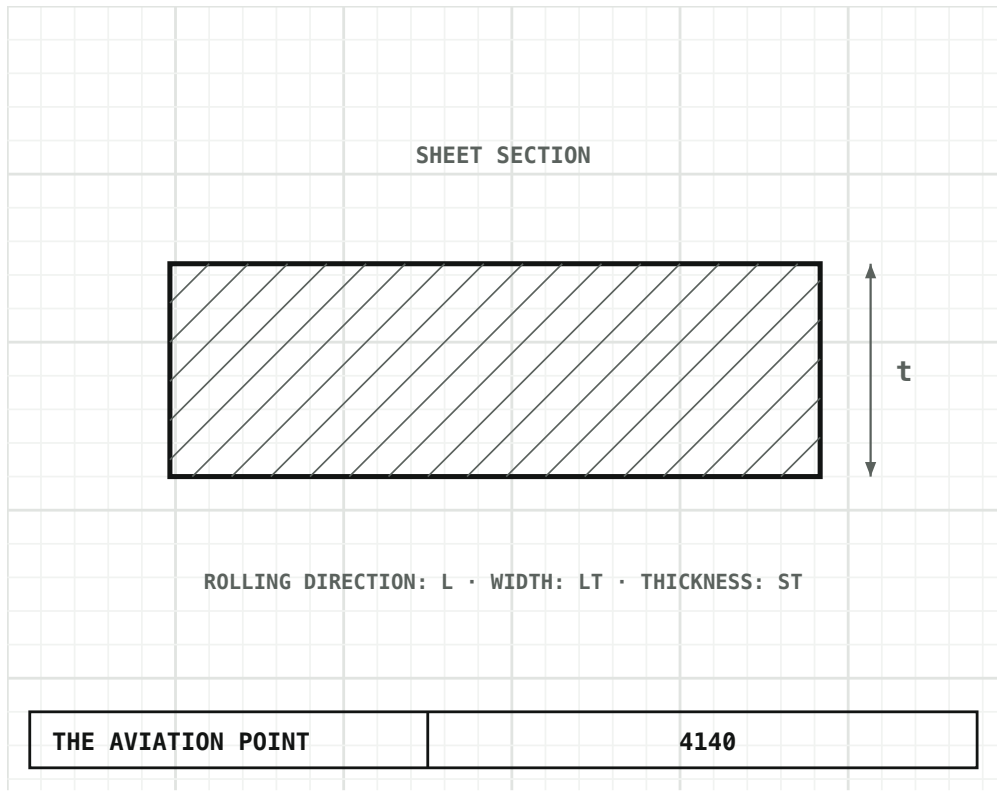
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4140 — alloy steel

4130's heavier cousin: more carbon, so it hardens in thicker sections and reaches higher strength.



Schematic

Designation

Item	Value
Designation	4140
Class	Steel and stainless
Type	alloy steel

Composition

Item	Limit	Source
Composition	Chromium 0.80–1.10 %, molybdenum 0.15–0.25 %, carbon 0.38–0.43 %	AZoM AISI 4140 composition table; the 41 means Cr-Mo steel and 40 about 0.40 % carbon (AMT Handbook, p. 5-16)

Properties

Property	Value	Source
Against 4130	Can be heat treated in thicker sections and to higher strength levels than 4130	MIL-HDBK-5J, par. 2.3.1.0
Typical use	Structural machined and forged parts one-half inch and over in thickness	MIL-HDBK-5J, par. 2.3.1.0
Sheet, strip, plate	AMS 6395	MIL-HDBK-5J, Table 2.3.1.0(a)
Bars and forgings	AMS-S-5626, AMS 6382, AMS 6349, AMS 6529	MIL-HDBK-5J, Table 2.3.1.0(a)
Tubing	AMS 6381	MIL-HDBK-5J, Table 2.3.1.0(a)
Alternate	AISI 8740 is listed as the alternate to 4140	MIL-HDBK-5J, par. 2.3.1.0
Welding rod	4140 rod, AMS 6452, AWS A5.28	AC 43.13-1B CHG 1, Table 4-15

The handbook gives no design allowables for 4140: its Table 2.3.1.0(a) marks these specifications as not containing minimum mechanical properties. The strength depends on the heat treatment shown on the part drawing or certificate.

Notes

- **No allowables on this page** because the public handbook has none for 4140. Use MMPDS or the drawing.
- **Not a welding recommendation.** TIG weld only with the procedure the SRM or the drawing gives.
- **Not a substitute for 4130 tube.** Different carbon, different weld behaviour.

SOURCES · MIL-HDBK-5J, Metallic Materials and Elements for Aerospace Vehicle Structures · FAA AC 43.13-1B CHG 1 · FAA-H-8083-31B, Aviation Maintenance Technician Handbook, Airframe, Volume 1 · MMPDS · AZoM, AISI 4140 alloy steel

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theaviationpoint.com/parts/materials/4140/

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