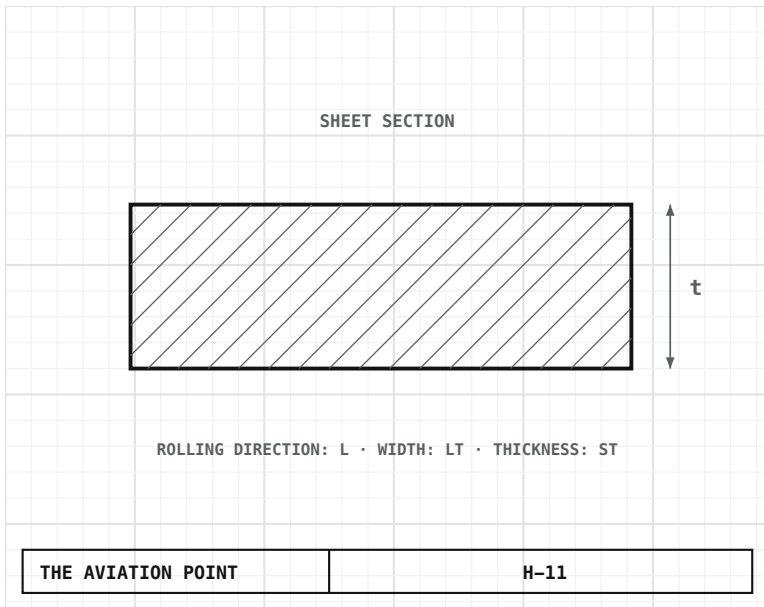
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H-11 — hot-work die steel

The air-hardening steel that keeps its strength to 1,000 °F.



Schematic

Designation

Item	Value
Designation	H-11
Class	Steel and stainless
Type	hot-work die steel

Composition

Item	Limit	Source
Composition	Chromium about 5 %, molybdenum about 1.3 %, vanadium about 0.5 %, carbon 0.38–0.43 %	SAE AMS 6487 title: 5.0Cr - 1.3Mo - 0.50V (0.38 - 0.43C) (H-11)

Properties

Property	Value	Source
Name	MIL-HDBK-5J calls it 5Cr-Mo-V aircraft steel and lists AMS 6487 for it; the title of AMS 6487 names the same chemistry as H-11	MIL-HDBK-5J, par. 2.4.1.0 and Table 2.4.1.0(b); SAE AMS 6487 title
Temperature range	High strength up to 1,000 °F; air hardenable, little distortion in thick sections	MIL-HDBK-5J, par. 2.4.1.0 and Table 2.4.1.0(b); SAE AMS 6487 title
Quality	Consumable electrode vacuum-melted recommended for aerospace	MIL-HDBK-5J, par. 2.4.1.0 and Table 2.4.1.0(b); SAE AMS 6487 title
Sheet, strip, plate	AMS 6437	MIL-HDBK-5J, Table 2.4.1.0(d)
Bars and forgings	AMS 6487 and AMS 6488	MIL-HDBK-5J, Table 2.4.1.0(c)
Heat treatment	1,850 ± 50 °F, hold 15-25 min for sheet or 30–60 min for bar, air cool, temper three times for 2–3 h each, air cool	MIL-HDBK-5J, par. 2.4.1.0 and Table 2.4.1.0(b); SAE AMS 6487 title

Design allowables — 5Cr-Mo-V sheet, strip and plate, quenched and tempered

Property	240 ksi level	260 ksi level	280 ksi level	Unit
Ftu, LT	240	260	280	ksi
Fty, LT	200	220	240	ksi
Fcy, LT	220	240	260	ksi
Fsu	144	156	168	ksi
Elongation, LT, in 2 in (sheet over 0.050 in)	6	5	4	%
Elongation, LT, in 1 in	8	7	6	%
Tempering temperature	1,050	1,030	1,000	°F
Hardness	49–52	52–54	54–56	HRC

The tempering and hardness values are from Table 2.4.1.0(a) pages 2-66 and are listed against Ftu levels 280, 260, 240 and 220 ksi at 1,000, 1,030, 1,050 and 1,080 °F. Design values apply only to parts whose Ftu is substantiated by quality control testing. Source: MIL-HDBK-5J, Table 2.4.1.0(d), p. 2-69.

Notes

- **Vacuum-melted material.** The handbook recommends only that quality for aerospace.
- **Sheet values only here.** Bar values are in Table 2.4.1.0(c).

SOURCES · MIL-HDBK-5J, Metallic Materials and Elements for Aerospace Vehicle Structures · FAA AC 43.13-1B CHG 1 · MMPDS · SAE AMS 6487K, Steel, Bars, and Forgings 5.0Cr - 1.3Mo - 0.50V

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