

H12 Tool Steel Heat Treatment

The chemistry, the hardening cycle and the tempering response of H12 chromium-tungsten hot work steel, from the reference page on aobosteel.com. A reference summary of published practice and not an Aobo Steel specification.

Reference only. The chemistry, the hardening cycle and the tempering response are reproduced from the source named at the foot of this sheet. The figures are shop reference values rather than a specification, and the card carries no tolerances. Run a trial part before committing production work to this cycle.

Chemistry of H12

Source, heat treating reference information for H12, printed page 187.

Element	Percent
Carbon	0.35
Manganese	0.30
Silicon	1.00
Chromium	5.00
Molybdenum	1.60
Vanadium	0.30
Tungsten	1.30

The card prints one figure for each element rather than a specification range. Cobalt and sulfur appear on the card with no figure against them and are left out of the table rather than shown as a zero.

Hardening H12

Source, heat treating reference information for H12, printed page 187.

Step	H12
Preheat	1200 °F (650 °C)
Harden	1850 °F (1010 °C)
Quench	Air quench

The card prints one hardening temperature and one quench medium for the grade, with no oil or salt alternative alongside the air quench. Its preheat of 1200 °F (650 °C) sits below the 1500 °F (815 °C) the hardening and tempering chart on this site prints for H11 and H12, and the card attaches no size condition to the step.

Tempering response of H12

Source, heat treating reference information for H12, printed page 187.

Temper, °F	°C	H12, HRC
As quenched	No temper	56
300	150	53
400	205	52
600	315	52
800	425	53
1000	540	54
1200	650	36

The card steps from 300 °F to 1200 °F and prints no 500 °F row. The first row is the hardness as quenched, before any temper.

The card carries 0.35% carbon with 5.00% chromium, 1.60% molybdenum and 1.30% tungsten, hardens at 1850 °F (1010 °C) from a 1200 °F (650 °C) preheat into air, and steps the tempering line from 56 HRC as quenched down to 52 HRC at 600 °F (315 °C), back up to 54 HRC at 1000 °F (540 °C) and down to 36 HRC at 1200 °F (650 °C), with cobalt and sulfur left without a figure on the card.

Aobo Steel, tool steel supplier

Aobo Steel supplies tool steel to distributors and mold, tool and die shops, including D2, D3, O1, O2, A2, S7, H13, H11, H12, M2, L6, P20 and 420 and 440C stainless. Forged or hot rolled, annealed or pre-hardened, cut to your sizes, with test certificates.

Reference data compiled from Heat Treatment, Selection, and Application of Tool Steels (William E. Bryson, second edition, Hanser). The chemistry, the hardening cycle and the tempering response for H12 come from the heat treating reference information on printed page 187.

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