

M7 Tool Steel Heat Treatment

The chemistry, the hardening cycle and the tempering response of molybdenum high speed steel M7, 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 a production tool to this cycle.

Chemistry of M7

Source, heat treating reference information for M7, printed page 192.

Element	Percent
Carbon	1.00
Manganese	0.30
Silicon	0.40
Chromium	3.75
Molybdenum	8.75
Vanadium	2.00
Tungsten	1.75

The card prints one figure for each element rather than a specification range. Cobalt and sulfur are listed on the card with no figure against them, so those rows are left out of the table instead of being shown as a zero.

Hardening M7

Source, heat treating reference information for M7, printed page 192.

Step	M7
Preheat	1500 °F (815 °C)
Harden	2200 °F (1205 °C)
Quench	Oil or salt quench

The card prints one preheat, one hardening temperature and one quench medium for the grade. This card carries no asterisk on the preheat, unlike the O1 and O6 cards alongside it, so 1500 °F is printed for the load as written rather than as a step conditional on section size.

Tempering response of M7

Source, heat treating reference information for M7, printed page 192.

Temper, °F	°C	M7, HRC
As quenched	No temper	66
900	480	65
950	510	66
1000	540	66
1050	565	65
1100	595	64
1150	620	58
1200	650	54

The card steps the tempering temperatures by 50 °F from 900 °F to 1200 °F and prints one Rockwell C figure on each row. The first row is the hardness as quenched, before any temper. The figures hold within one point of the as-quenched value up to 1050 °F and fall away after that, and the card stops at 1200 °F.

The card carries 8.75% molybdenum and 1.75% tungsten with no cobalt figure, hardens the grade in oil or salt from 2200 °F (1205 °C) after a 1500 °F (815 °C) preheat, and holds 66 HRC as quenched within one point up to 1050 °F (565 °C) before the tempering line falls to 54 HRC at 1200 °F (650 °C).

Aobo Steel, tool steel supplier

Aobo Steel supplies tool steel to distributors and mold, tool and die shops, including D2, D3, O1, O2, O6, A2, S7, H13, H11, M2, L6, P20 and 420 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 M7 come from the heat treating reference information on printed page 192.

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