

A10 Tool Steel Heat Treatment

The chemistry, the hardening cycle and the tempering response of A10 graphitic tool 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 A10

Source, heat treating reference information for A10, printed page 183.

Element	Percent
Carbon	1.35
Manganese	1.80
Silicon	1.25
Molybdenum	1.50
Graphite	0.35
Nickel	1.80

The card prints one figure for each element rather than a specification range. Chromium, vanadium, tungsten, 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 printed as blanks. Graphite is the free graphite the card prints for the grade, which is what gives the grade its name.

Hardening A10

Source, heat treating reference information for A10, printed page 183.

Step	A10
Preheat	1200 °F (650 °C)
Harden	1475 °F (800 °C)
Quench	Air quench

The card prints one preheat step, one hardening temperature and one quench medium for the grade, with no section-size condition against any of them, so the figures stand for the load as written. The hardening temperature the site lists for A10 in the hardening and tempering temperature chart is 1450 to 1500 °F (790 to 815 °C), and the single figure on this card sits inside that range.

Tempering response of A10

Source, heat treating reference information for A10, printed page 183.

Temper, °F	°C	A10, HRC
As quenched	No temper	62
300	150	61
400	205	60
500	260	60
600	315	59
700	370	58
800	425	57
900	480	55
1000	540	51

The card prints one Rockwell C figure on each row. Unlike some cards in the same set, this one carries a figure on the as quenched row, 62 HRC, so that row is shown with no tempering temperature against it. The temperatures run to 1000 °F (540 °C) and the hardness falls from the first row downwards with no second rise. The card carries 1.35% carbon with graphite printed as a row of its own at 0.35%, hardens in air from 1475 °F (800 °C) after a 1200 °F (650 °C) preheat, and steps the tempering line from 62 HRC as quenched down to 61 HRC at 300 °F (150 °C) and 51 HRC at 1000 °F (540 °C), with chromium, vanadium, tungsten, 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, 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 A10 come from the heat treating reference information on printed page 183.

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