

440A Stainless Steel Heat Treatment

The chemistry, the hardening cycle and the tempering response of 440A martensitic stainless 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 440A

Source, heat treating reference information for 440A, printed page 201.

Element	Percent
Carbon	0.70
Manganese	1.00
Silicon	1.00
Chromium	17.00
Molybdenum	0.75
Phosphorus	0.04 max
Sulfur	0.03 max

The card prints one figure for each element rather than a specification range. Vanadium and tungsten 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. Phosphorus and sulfur are printed as maxima.

Hardening 440A

Source, heat treating reference information for 440A, printed page 201.

Step	440A
Preheat	1400 °F (760 °C)
Harden	1900 °F (1040 °C)
Quench	Air or oil quench

The card prints one preheat step, one hardening temperature and two quench media for the grade, with no section-size condition against any of them, so the figures stand for the load as written.

Tempering response of 440A

Source, heat treating reference information for 440A, printed page 201.

Temper, °F	°C	440A, HRC
300	150	57
400	205	56
500	260	54
600	315	52
700	370	51
800	425	50

The card leaves the as quenched row without a figure, so that row is left out of the table. Tempering runs from 300 °F to 800 °F in 100 °F steps with one Rockwell C figure on each row, and the hardness falls from the first row onwards with no second rise.

The card carries 0.70% carbon and 17.00% chromium with phosphorus and sulfur printed as maxima, hardens the grade in air or oil from 1900 °F (1040 °C) after a 1400 °F (760 °C) preheat, and steps the tempering line from 57 HRC at 300 °F (150 °C) down to 50 HRC at 800 °F (425 °C), with no figure printed on the as quenched row.

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 440A come from the heat treating reference information on printed page 201.

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