

Cr-Mo-V Hot Work Steel Thermal Constants

Thermal conductivity, specific heat, the heat transfer coefficient of the quench surface and the elastic, yield and expansion behaviour of a Cr-Mo-V hot work die steel, printed by the source in the austenite and the bainite condition, together with the start and finish temperature of its transformation.

Reference only. The values on this sheet are reproduced from the source named at the foot of it. They are a published reference rather than a specification of ours, and the sheet carries no tolerances. The steel is named by the source only as a Cr-Mo-V steel, and every figure is given twice, once for austenite and once for bainite.

Thermal constants of the Cr-Mo-V steel in the austenite and the bainite condition

Source, thermal constants of the Cr-Mo-V steel, printed page 4-28 of the report (PDF page 89).

Temp., °C	Conductivity, austenite, W per m per K	Conductivity, bainite, W per m per K	Specific heat, austenite, J per kg per K	Specific heat, bainite, J per kg per K	Heat transfer coefficient, W per sq m per K
20	n/a	44.2	n/a	481	5250
100	n/a	43.5	n/a	480	1750
150	n/a	43	n/a	494	1050
200	24.4	42.6	615	502	700
400	24.4	41.9	624	527	700
600	24.4	41.9	632	553	700
800	26.7	n/a	636	n/a	700
1000	27.9	n/a	645	n/a	700

Austenite and bainite are the two conditions the source prints. It marks a cell with a dot where it has no value and those cells are marked n/a here, so a missing value is not read as a zero. Density is 7800 kg per cubic metre. A reference table only, it is not an Aobo Steel specification.

Mechanical properties of the Cr-Mo-V steel in the austenite and the bainite condition

Source, mechanical properties of the Cr-Mo-V steel, printed page 4-28 of the report (PDF page 89).

Temp., °C	Young's modulus, GN per sq m	Yield stress, austenite, MN per sq m	Yield stress, bainite, MN per sq m	Expansion, austenite, millionths per K	Expansion, bainite, millionths per K
20	205	n/a	860	n/a	11
100	201	n/a	860	n/a	11
150	198	n/a	860	n/a	11
200	194	105	860	21	11
400	173	95	860	21	11
600	145	85	860	23	11
800	115	60	n/a	25	n/a
1000	85	20	n/a	25	n/a

The source prints expansion multiplied by 10 to the power minus 5 per kelvin, from 1.1 to 2.5, and the values are written out here in millionths per kelvin, so 2.1 becomes 21. Poisson's ratio 0.3 and a strain hardening coefficient of 0.05 E belong to the same steel and are stated in the source footnote. A reference table only, it is not an Aobo Steel specification.

Start and finish temperature, latent heat and dilatation of the transformation

Source, characteristics of phase transformation of the Cr-Mo-V steel, printed page 4-28 of the report (PDF page 89).

Start temperature, °C	Finish temperature, °C	Latent heat, kJ per kg	Dilatation, per cent
520	315	753	0.38

The source prints latent heat as 7.53 multiplied by 10 to the power 5 J per kg, which is 753 kJ per kg, and gives no name for the transformation or for the structure it produces. Dilatation is a linear change in per cent. A reference table only, it is not an Aobo Steel specification.

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, M10, H21, M2, M42, 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 Improved Life of Die Casting Dies of H13 Steel by Attaining Improved Mechanical Properties and Distortion Control During Heat Treatment (J. F. Wallace and D. Schwam, US Department of Energy final report DOE/ID/13320-3, October 1998). The three tables are printed together on page 4-28 of that report, which is PDF page 89. Every figure on this page was read from the page image rather than from an automatic text layer.

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