

Chinese High Speed Steel Grades: Hardness, Strength and Toughness

Hardness, bending strength, impact toughness and the hardness held at 600 C for the Chinese high speed steel grades, grouped by the alloying route that separates one family from the next.

Reference only. This is a reference summary of published practice and not a specification of ours. Hardness is the value after the quench and temper cycle published for the grade. The table prints 0.20 to 0.80 MJ/m² for W10Mo4Cr4V3Al and no 600 C hardness for W9Mo3Cr4V, W9Mo3Cr4V3Co10 and W9Mo4V5, exactly as the source prints them. Confirm the grade and the heat treatment cycle before the data is written into a process sheet.

Grades and properties

Hardness, bending strength, impact toughness and 600 C hardness

Grade type	Grade	Hardness HRC	Bending strength MPa	Impact toughness MJ/m ²	Hardness at 600 °C, HRC
General purpose	W18Cr4V	63-66	3000-3400	0.18-0.32	48.5
General purpose	W6Mo5Cr4V2	63-66	3500-4000	0.30-0.40	47-48
General purpose	W9Mo3Cr4V	65-67	4000-4500	0.35-0.40	-
Aluminium bearing	W6Mo5Cr4V2Al	68-69	3430-3730	0.23-0.30	55
Aluminium bearing	W10Mo4Cr4V3Al	68-69	3010	0.20-0.80	54
Cobalt bearing	W12Mo3Cr4V3Co5Si	69-70	2350-2650	0.11-0.22	54
Cobalt bearing	W9Mo3Cr4V3Co10	66-69	2310	-	55
Cobalt bearing	W7Mo4Cr4V2Co5	65-68	2450-2950	0.23-0.30	54
Cobalt bearing	W2Mo9Cr4VCo8	66-70	2450-2950	0.23-0.30	55
High carbon high vanadium	W12Cr4V4Mo	63-66	3140	0.10	52
High carbon high vanadium	W6Mo5Cr4V3	63-66	3140	0.24	51.7
High carbon high vanadium	W9Mo4V5	63-66	3140	0.245	-

Compiled from 刀具材料速查手册, Table 2-19, Common high speed steel grades and properties in China, printed page 41. Every figure was read from the searchable text layer of the file and checked grade by grade against the table as printed. It is a reference summary rather than an Aobo Steel specification. Read the two strength columns against the two hardness columns. The general purpose grades carry the highest bending strength and the best impact toughness, the cobalt bearing grades carry the least of both while reaching the highest hardness and holding it at 600 C, and the aluminium bearing grades reach the cobalt hardness band without the cobalt addition.

Aobo Steel, tool steel supplier

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