

Carbide Volume Fractions in Tool and Knife Steels

How much carbide and nitride each of 38 tool and knife steel grades carries after a typical heat treatment, split by the type of particle that forms it.

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 volumes belong to a typical heat treatment and shift with the austenitizing temperature. A dash is a cell the source leaves empty, which means none of that particle type is present.

Carbide and nitride volume fractions by particle type

Source, carbide volume fractions for different knife steels, Table 8.2 on printed page 84 of the source, which is PDF page 91 of the copy consulted.

Steel	Fe ₃ C	CrC	CrVC	MC	M ₆ C	MN	CrN
CPM M4	-	-	-	6.5	7	-	-
M2	-	-	-	2	10.5	-	-
410	-	3	-	-	-	-	-
420	-	3	-	-	-	-	-
AEB-L	-	6	-	-	-	-	-
Sleipner	-	8	-	-	-	-	-
440A	-	10	-	-	-	-	-
440C	-	12	-	-	-	-	-
D2	-	15.5	-	-	-	-	-
154CM	-	17.5	-	-	-	-	-
ZDP-189	-	36	-	-	-	-	-
CruWear	-	-	5.9	3.4	-	-	-
S35VN	-	-	10.5	2.5	-	-	-
S30V	-	-	10.5	4	-	-	-
S90V	-	-	13	9	-	-	-
S125V	-	-	16	12.5	-	-	-
BG-42	-	-	16	-	-	-	-
Elmax	-	-	16	2	-	-	-
M390	-	-	17.5	2.5	-	-	-
S60V	-	-	21.5	2.1	-	-	-
Vanax	-	-	-	-	-	4	10
LC200N	-	-	-	-	-	-	4.5
3V	-	-	-	5.1	-	-	-
Vanadis 4E	-	-	-	8.2	-	-	-
N690	-	18	-	-	-	-	-
Rex 45	-	-	-	2.5	5.3	-	-
5160	0	-	-	-	-	-	-
1095	3	-	-	-	-	-	-
O1	3	-	-	-	-	-	-
O2	3	-	-	-	-	-	-
52100	6	-	-	-	-	-	-
26C3	8	-	-	-	-	-	-
A2	-	6	-	-	-	-	-
19C27	-	8	-	-	-	-	-
Niolox	-	8	-	1	-	-	-
XHP	-	22	-	-	-	-	-
Vanadis 8	-	-	-	15	-	-	-
10V	-	-	-	17.5	-	-	-

Volumes are per cent of the steel by volume for a typical heat treatment and they shift with the austenitizing temperature. A dash is a cell the source leaves empty, which means none of that particle type is present, and the source prints an explicit zero for the iron carbide in 5160. 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 Knife Engineering, Steel, Heat Treating, and Geometry (Larrin Thomas). Table 8.2 is printed on page 84 of the printed book, which is PDF page 91 of the copy consulted. The values were read from the page image rather than from an automatic text layer.

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