

46MnVS3 All

General Information

46MnVS3 is a micro-alloyed steel suitable for forging where no further heat-treatment is necessary. SB9850 is treated to give excellent machinability. Two available variants are SB9850 and 382K.

* Designation followed by "*" is not an official EN standard grade but named according to the rules in EN 10027.

Similar designations

SB9850 - S620*, 1.1305

Chemical composition

Variant	Cast	Weldability		C%	Si%	Mn%	P%	S%	Cr%	Ni%	Mo%	V%	Ti%	Cu%	Al%	N%
SB9850	CC	CEV 0.65 _{max}	Min	0.42	0.15	0.70	-	0.040	-	-	-	0.070	-	-	-	0.0090
		Pcm 0.55 _{max}	Max	0.46	0.40	1.00	0.035	0.060	0.30	-	0.08	0.200	0.010	-	0.030	0.0200
382K	IC	CEV 0.75 _{max}	Min	0.42	0.25	0.85	-	0.045	0.15	-	-	0.080	-	-	0.015	0.0090
		Pcm 0.57 _{max}	Max	0.46	0.40	1.00	0.035	0.060	0.25	0.30	-	0.100	-	0.25	0.030	0.0140
46MnVS3 EN 10267:1998 (ref)	Std	CEV 0.71 _{max}	Min	0.42	0.15	0.60	-	0.020	-	-	-	0.080	-	-	-	0.0100
		Pcm 0.56 _{max}	Max	0.49	0.80	1.00	0.025	0.060	0.30	-	0.08	0.200	-	-	-	0.0200

Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A_5 [%]	Reduction of area Z_{min} [%]	Hardness
SB9850	+AR	Round bar	15 < 23	620**	775-890	18	35	235-270 HB
		Round bar	24 < 30	580**	775-890	16	-	235-270 HB
		Round bar	31 < 50	560**	775-890	16	-	235-270 HB
		Round bar	51 < 90	540**	775-890	16	-	235-270 HB
46MnVS3 EN 10267:1998 (ref)	+AR	All formats	-	450**	700-900	14	30	-

$R_{p0.2}$ * R_{eh} , ** R_{el}

The limits for 46MnVS3 are valid for bars after controlled cooling. Forging will increase yield and tensile strength and decrease elongation and reduction of area.

Transformation temperatures

	Temperature °C
MS	314
AC1	733
AC3	794

Other properties (typical values)

Youngs module (GPa)	Poisson´s ratio (-)	Shear module (GPa)	Density (kg/m3)
210	0.3	80	7800
Average CTE 20-300°C (µm/m°K)	Specific heat capacity 50/100°C (J/kg°K)	Thermal conductivity Ambient temperature (W/m°K)	Electrical resistivity Ambient temperature (µΩm)
12	460 - 480	40 - 45	0.20 - 0.25

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