

## Material specification sheet

### Saarstahl - 20MnCrB5

Material No.:	Former brand name:	International steel grades:
1.7168	EC 100 B	BS: AFNOR: SAE:

**Material group:** Boron alloyed case hardening steel

Chemical composition: (Typical analysis in %)	C	Si	Mn	Cr	other
	0,20	0,25	1,15	1,15	+B (+Pb)

**Application:** Boron alloyed case hardening steel for parts with a required core tensile strength of 1000 - 1300 N/mm<sup>2</sup> and good wearing resistance as bushes, piston bolts, camshafts, spindles, gears, shafts and other mechanical controlling and gearing components. Boron increases the hardenability and the toughness of case hardened parts.

<b>Hot forming and heat treatment:</b>	Forging or hot rolling:	1100 - 850°C
	Normalising:	840 - 870°C/air
	Soft annealing:	650 - 700°C/furnace
	Carburising:	870 - 930°C/oil
	Core hardening:	850 - 880°C
	Intermediate annealing:	650 - 700°C
	Case hardening:	810 - 840°C/oil
	Tempering:	170 - 210°C

<b>Mechanical Properties:</b>	Treated for hardness range - BF (+TH):	170 - 217 HB
	Treated for ferrite and pearlite structure and hardness range, +FP:	152 - 201 HB
	Soft annealed, +A:	max. 217 HB

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Condition of heat treatment: blank hardened

Diameter d [mm]	< 11	>11 – 30	>30 – 63
<b>0,2% proof stress</b> R <sub>p0,2</sub> [N/mm <sup>2</sup> ]	min. 730	min. 680	min. 550
<b>Tensile strength R<sub>m</sub></b> [N/mm <sup>2</sup> ]	1100 - 1400	1000 - 1300	800 - 1100
<b>Fracture elongation A<sub>5</sub></b> [%]	min. 7	min. 8	min. 10
<b>Reduction of area Z</b> [%]	min. 30	min. 35	min. 35
<b>Notch impact energy ISO-V</b> [J]	min. 15	min. 20	min. 20