

STANDARD REFERENCE:

EN ISO 683-4: 2018 (Hot-rolled products) | EN 10277: 2018 (Bright products)

RODACCIAI REFERENCES AND COMPARABLE STANDARDS

EUROPE		ITALY	GERMANY		FRANCE	UK	USA
EN 10087: 1998 EN 10277-3: 2008		(UNI 4838-80)	(DIN 1651-88)		(NF A 35-562-86)	(BS 970 pt.3-91)	ASTM A 29
Grade	N°		Werkstoff	N°			
46SPb20	1.0757	-	45 SPb 20	1.0757	-	-	-

CHEMICAL COMPOSITION (CAST ANALYSIS) (%)

C	Si / max	Mn	P / max	S	Pb
0,42÷0,50	0,40	0,70÷1,10	0,060	0,15÷0,25	0,15÷0,35

MECHANICAL PROPERTIES - AS ROLLED CONDITION

Size mm	as Rolled and/or as Rolled + Turned (+SH)		as Rolled and/or as Rolled + Turned + Quenched + Tempered (+SH +QT)		
	Hardness HB max	R _m (MPa)	R _{p0,2} (MPa) min	R _m (MPa)	A ₅ (%) min
≥5 ≤10	234*	590÷800*	490	700÷850*	12*
>10 ≤16	228*	590÷780*	490	700÷850*	12*
>16 ≤40	222	590÷760	430	650÷800	13
>40 ≤63	213	580÷730	370	630÷780	14
>63 ≤100	207	560÷710	370	630÷780	14

*Values valid only for hot rolled products
 For size <5 mm the mechanical properties may be agreed at the time of enquiry and order

MECHANICAL PROPERTIES OF BRIGHT STEEL

Size mm	Cold Drawn (+C)			Quenched + Tempered + Peeled (+QT +SH)*			Quenched + Tempered + Cold Drawn (+QT +C)		
	R _{p0,2} (MPa) min	R _m (MPa)	A ₅ (%) min	R _{p0,2} (MPa) min	R _m (MPa)	A ₅ (%) min	R _{p0,2} (MPa) min	R _m (MPa)	A ₅ (%) min
≥5 ≤10	570	740÷980	5	-	-	-	595	850÷1000	8
>10 ≤16	470	690÷930	6	-	-	-	560	800÷950	9
>16 ≤40	400	640÷880	7	430	650÷800	13	490	700÷850	10
>40 ≤63	380	610÷850	8	370	630÷780	14	490	700÷850	11
>63 ≤100	340	580÷820	8	370	630÷780	14	455	650÷850	11

*This values are valid also for Cold Drawn - Quenched + Tempered Condition (+C +QT)
 For size <5 mm the mechanical properties may be agreed at the time of enquiry and order

WORKING TEMPERATURES RECOMMENDED

Operation	Hot forgings deformation	Normalizing	Soft annealing	Quenching in oil or water	Tempering
°C	950÷1200	850÷880	650÷700	840÷870	540÷680

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FREE-CUTTING STEELS
DIRECT-HARDENING
46S20PB
