

<b>Quality</b>	<b>46SPb20</b>	<b>Free-cutting Steel</b>	<i>Technical card</i>
According to standard	<b>ISO 683-4: 2018</b>		<b>Lucefina Group</b>
Number	<b>1.0757</b>		rev. 2018

### Chemical composition

C%	Si% max	Mn%	P% max	S%	Pb%	Permissible deviations on the <b>product</b>
0,42-0,50 ± 0.03	0,40 ± 0.03	0,70-1,10 ± 0.04	0,06 ± 0.008	0,15-0,25 ± 0.03	0,15-0,35 +0.03 -0.02	

### Temperature °C

Hot-forming	Natural state +U	Soft annealing +A	Carburizing	Hardening on carburized surface	Stress-relieving +SR
1230-950	(HB 234 max)	680 air			
Normalizing +N	Direct hardening	Direct hardening	Stress-relieving +SR	Pre-heating welding	Stress-relieving after welding
860 air	840 water	860 oil or polymer	540-680 furnace cooling		not recommended

### Mechanical properties

Hot-rolled natural forming condition ISO 683-4: 2018				Hot-rolled quenched and tempered			
Testing at room temperature (longitudinal)				Testing at room temperature (longitudinal)			
size mm		R	HBW	R	Rp 0.2	A%	HBW
from	to	N/mm <sup>2</sup>	max	N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min	for info.
5	10	590-800	234	700-850	490	12	213-253
10	16	590-780	228	700-850	490	12	213-253
16	40	590-760	222	650-800	430	13	200-240
40	63	580-730	213	630-780	370	14	192-232
63	100	560-710	207	630-780	370	14	192-232

Cold-drawn +C EN 10277: 2018						Hot-rolled Peeled +SH			
Values valid also for +C+G						Values valid also for +SH+G			
size mm		Testing at room temperature (longitudinal)				Testing at room temperature (longitudinal)			
		R <sup>a)</sup>	Rp 0.2 <sup>a)</sup>	A%	HB	R	Rp 0.2	A%	HB
from	to	N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min	for info.	N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min	max
5 <sup>b)</sup>	10	740-980	570	5	224-295	-	-	-	-
10	16	690-930	470	6	210-278	-	-	-	-
16	40	640-880	400	7	198-263	590-760	-	-	222
40	63	610-850	380	8	183-253	580-730	-	-	213
63	100	580-820	340	8	172-246	560-710	-	-	207

<sup>a)</sup> for flats and special sections, yield point can be - 10% and tensile strength can be ± 10%

<sup>b)</sup> for thickness < 5 mm, mechanical properties should be agreed before order placement

Cold-drawn + quenching and tempering +C+QT EN 10277: 2018						Quenched and tempered + cold-drawn +QT+C			
size mm		Testing at room temperature (longitudinal)				Testing at room temperature (longitudinal)			
		R <sup>c)</sup>	Rp 0.2 <sup>c)</sup>	A% <sup>c)</sup>	HB <sup>c)</sup>	R	Rp 0.2	A%	HB
from	to	N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min	for info.	N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min	for info.
5 <sup>b)</sup>	10	-	-	-	-	850-1000	595	8	253-298
10	16	-	-	-	-	800-950	560	9	240-286
16	40	650-800	430	13	200-240	700-850	490	10	213-253
40	63	630-780	370	14	192-232	700-850	490	11	213-253
63	100	630-780	370	14	192-232	650-850	455	11	200-253

<sup>c)</sup> values valid also for +C+QT+G and +QT+SH

<sup>b)</sup> for thickness < 5 mm, mechanical properties should be agreed before order placement

EUROPE	ITALY	CHINA	GERMANY	FRANCE	U.K.	RUSSIA	USA
EN	UNI	GB	DIN	AFNOR	B.S.	GOST	AISI/SAE
46SPb20	46SPb20		45SPb20	46SPb20	46SPb20		