

<b>Quality</b>	<b>C48</b>
According to standard	<b>UNI 7847: 1979</b>

Number

## Chemical composition

C%	Si%	Mn%	P% max	S max	Deviations allowed for analysis product
0,45-0,52	0,15-0,40	0,50-0,80	0,030	0,030	
± 0.02	± 0.03	± 0.04	+ 0.005	+ 0.005	

Max Cr, Mo, Ni, Cu values can be agreed at the time of order placement

## Temperature °C

Hot-forming	Normalizing	Quenching	Quenching	Tempering	Stress-relieving
1100-850	860 air	830 water		550-650 air	180
Soft annealing	Isothermal annealing	Natural state	End quench hardenability test	Pre-heating welding	Stress-relieving after welding
700 air (HB max 238)	790 furnace cooling to 660, then air (HB 165-223)	(HB max 243)		not recommended	
				<b>Ac1</b> <b>Ac3</b>	<b>Ms</b> <b>Mf</b>
				730   770	330   120

## Mechanical properties

**Hot-rolled** mechanical properties obtained on test blanks after **normalizing** treatment UNI 7847: 1979. Use only as reference

test blanks diameter (mm)		Testing at room temperature (longitudinal)					
from	to	R	Rp 0.2	A%	C%	Kcu	HB
		N/mm <sup>2</sup>	N/mm <sup>2</sup> min.	min.	min.	J min.	<i>for information</i>
16	100	610-760	335	16			183-226

**Hot-rolled** mechanical properties on test blank after **quenching and tempering** (values valid for untreated products)

For quenched and tempered material supply, values must be guaranteed on the product

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test blanks diameter (mm)		Testing at room temperature (longitudinal)					
from	to	R	Rp 0.2	A%	C%	Kcu	HB
		N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min.	min.	J min	<i>for information</i>
	16	730-875	510	13		20	224-262
16	40	680-830	430	14		15	208-249
40	100	630-770	400	15		15	192-231

For dimensions over 100 mm, mechanical properties can be agreed before order placement

## Cold-drawn

diameter mm		Testing at room temperature (longitudinal)			
from	to	R N/mm <sup>2</sup>	Rp 0.2 N/mm <sup>2</sup> min	A% min	HB

No indications from reference standards; use C45E – C50E values as reference

<b>Jominy test HRC</b>															Min. surface hardness after hardening and stress-relieving		
mm distance from quenched extremity																	
	1.5	3	5	7	9	11	13	15	20	25	30	35	40	45	50		
<b>min</b>	No indications from reference standards; use C 50E values as reference															HRC	56
<b>max</b>																	

EUROPE EN	ITALY UNI	CHINA GB	GERMANY DIN	FRANCE AFNOR	U.K. B.S.	RUSSIA GOST	USA AISI/SAE
	C48						1049