

<b>Quality</b>	<b>C48</b>	<b>Flame and Induction Hardening Steel</b>	<i>Technical card</i>
According to standard	<b>UNI 7847: 1979</b>		<b>Lucefin Group</b>
Number	-		rev. 2018

### Chemical composition

C%	Si%	Mn%	P% max	S max	
0,45-0,52	0,15-0,40	0,50-0,80	0,030	0,030	Product deviations are allowed
± 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 +N	Quenching +Q	Quenching +Q	Tempering +T	Stress-relieving +SR		
1100-850	860 air	830 water	-	550-650 air	180		
Soft annealing +A	Isothermal annealing +I	Natural state +U	End quench hardability 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

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

UNI 7847:1979. Use only as reference

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

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

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

### Jominy test HRC

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

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