

STANDARD REFERENCE:

EN ISO 683-1: 2018 (Hot-rolled products) | EN 10277: 2018 (Bright products)

RODACCIAI REFERENCES AND COMPARABLE STANDARDS

EUROPE		ITALY	GERMANY		FRANCE	UK	USA
EN 10083-2: 2006 EN 10277-5: 2008		(UNI 7845-78)	(DIN 17200-86)		(NF A 35-552-86)	(BS 970 pt.3-96)	ASTM A 29
Grade	N°		Werkstoff	N°			
C50E	1.1206	C50	Ck 50	1.1206	-	080M50	1050
C50R Pb	1.0542	C50	Ck 50	1.0542	-	080M50 LEADED	10L50

CHEMICAL COMPOSITION (CAST ANALYSIS) (%)

EUROPE	C	Si	Mn	P / max	S / max	Cr / max	Mo / max	Ni / max	Cu / max	Pb
C50E	0,47÷0,55	0,10÷0,40	0,60÷0,90	0,025	0,035	0,40	0,10	0,40	0,30	-
C50R Pb					0,020÷0,040					0,015÷0,030

MECHANICAL PROPERTIES - AS ROLLED CONDITION

Size mm	HB max to condition		Quenched and tempered (+QT)					Normalized (+N)		
	Treated to improve shearability (+S)	Soft annealing (+A)	R _{p0,2} (MPa) min	R _m (MPa) min	A ₅ (%) min	Z (%) min	KV (%) min	R _{p0,2} (MPa) min	R _m (MPa)	A ₅ (%) min
≤ 16	255	217	520	750÷900	13	30	-	355	650	12
> 16 ≤ 40	255	217	460	700÷850	15	35	-	320	610	14
> 40 ≤ 100	255	217	400	650÷800	16	40	-	320	610	14
> 100 ≤ 160	255	217	-	-	-	-	-	290	590	14
> 160 ≤ 250	255	217	-	-	-	-	-	290	590	14

MECHANICAL PROPERTIES - BRIGHT PRODUCTS CONDITION

Size mm	Rolled+Turned (+SH)		Quenched+Tempered+Turned (+QT+SH)*				Quenched+Tempered+Cold Drawn (+QT+C)			Cold Drawn (+C)		
	Hardness HB	R _m (MPa)	R _{p0,2} (MPa) min	R _m (MPa)	A ₅ (%) min	KV (J) 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	-	-	-	-	-	-	610	870÷1070	7	590	770÷1100	5
> 10 ≤ 16	-	-	-	-	-	-	580	830÷1030	7	520	730÷1080	6
> 16 ≤ 40	179÷269	610÷910	460	700÷850	15	-	555	790÷990	8	440	690÷1050	7
> 40 ≤ 63	179÷269	610÷910	400	650÷800	16	-	510	730÷930	9	390	650÷1030	8
> 63 ≤ 100	179÷269	610÷910	400	650÷800	16	-	475	680÷880	9	-	-	-

*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	Tempering
°C	850÷1150	830÷870	650÷700	810÷850	550÷660

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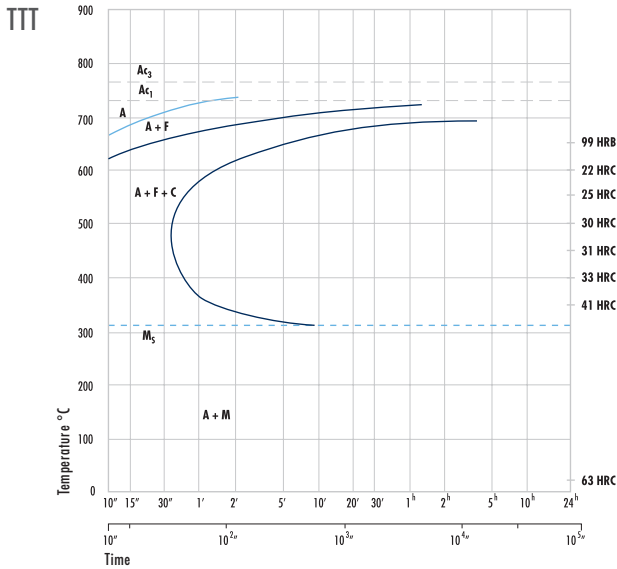
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QUENCHING AND TEMPERING
 NOT ALLOYED

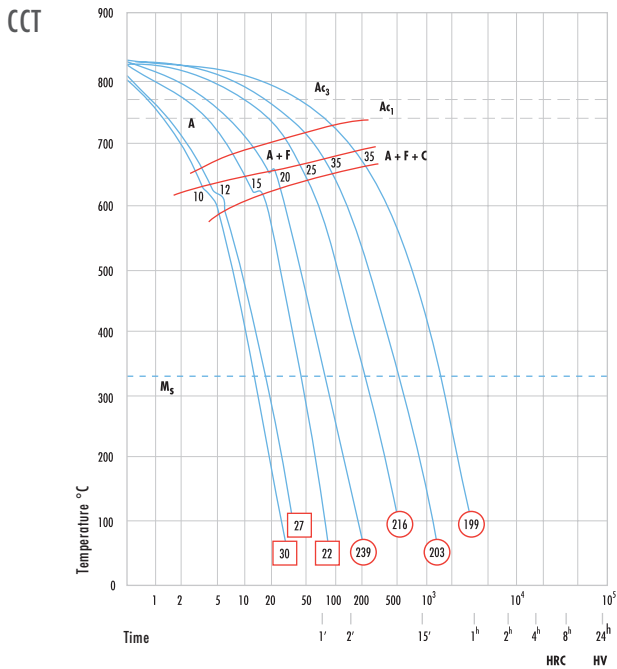
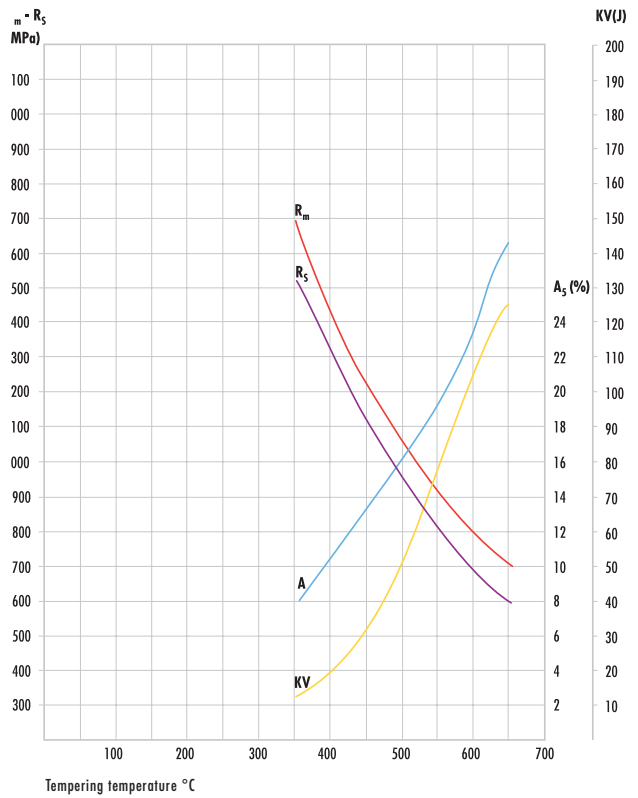
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HARDNESS LIMITS (JOMINY TEST)

Limits of range		Hardness HRC at a distance from quenched end of test pieces (mm)															
		1	2	3	4	5	6	7	8	9	10	11	13	15	20	25	30
+H	Max	63	62	61	60	58	55	50	43	36	35	34	33	32	31	29	28
	Min	56	53	44	34	31	30	30	29	28	27	26	25	24	23	20	-



TEMPERING CURVE



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