

**STANDARD REFERENCE:**

EN ISO 683-2: 2018 (Hot-rolled products) | EN 10277: 2018 (Bright products)

**RODACCIAI REFERENCES AND COMPARABLE STANDARDS**

EUROPE		ITALY	GERMANY		FRANCE	UK	USA
EN 10083-3: 2006		(UNI 7845-78)	(DIN 17200-86)		(NF A 35-552-86)	(BS 970 pt.3-96)	ASTM A 29
Grade	N°		Werkstoff	N°			
50CrMo4	1.7228	-	50CrMo4	1.7228	-	-	4150

**CHEMICAL COMPOSITION (CAST ANALYSIS) (%)**

C	Si	Mn	P / max	S	Cr	Mo	Cu / max	Al
0,46÷0,54	0,10÷0,40	0,50÷0,80	0,025	0,020÷0,035	0,90÷1,20	0,15÷0,30	0,40	0,020÷0,050

**MECHANICAL PROPERTIES - AS ROLLED CONDITION**

Size mm	HB max to condition		Quenched and tempered (+QT)				
	Treated to improve shearability (+S)	Soft annealing (+A)	R <sub>p0,2</sub> (MPa) min	R <sub>m</sub> (MPa)	A <sub>5</sub> (%) min	Z (%) min	KV (J) min
≤ 16		248	900	1100÷1300	9	40	-
> 16 ≤ 40	where the shearability is of importance, this steel should be ordered in the "soft annealed" condition	248	780	1000÷1200	10	45	30
> 40 ≤ 100		248	700	900÷1100	12	50	30
> 100 ≤ 160		248	650	850÷1100	13	50	30
> 160 ≤ 250		248	550	800÷950	13	50	30

**MECHANICAL PROPERTIES - BRIGHT PRODUCTS CONDITION**

Size mm	as Rolled+Turned (+A+SH)	Quenched+Tempered+Turned (+QT+SH)*				Quenched+Tempered+Cold Drawn (+QT+C)			as Rolled+Cold Drawn(+A+C)
	Hardness HB max	R <sub>p0,2</sub> (MPa) min	R <sub>m</sub> (MPa)	A <sub>5</sub> (%) min	KV (J) min	R <sub>p0,2</sub> (MPa) min	R <sub>m</sub> (MPa)	A <sub>5</sub> (%) min	Hardness HB max
≥ 5 ≤ 10	-	-	-	-	-	770	1000÷1200	6	315
> 10 ≤ 16	-	-	-	-	-	750	1000÷1200	7	305
> 16 ≤ 40	248	780	1100÷1200	10	30	720	1000÷1200	7	300
> 40 ≤ 63	248	680	900÷1100	12	30	680	900÷1200	8	295
> 63 ≤ 100	248	650	900÷1100	12	30	650	900÷1200	8	295

\*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	Isothermal annealing	Soft annealing	Quenching in water or oil	Tempering
°C	850÷1150	820÷860 → 640	680÷720	820÷860	540÷680

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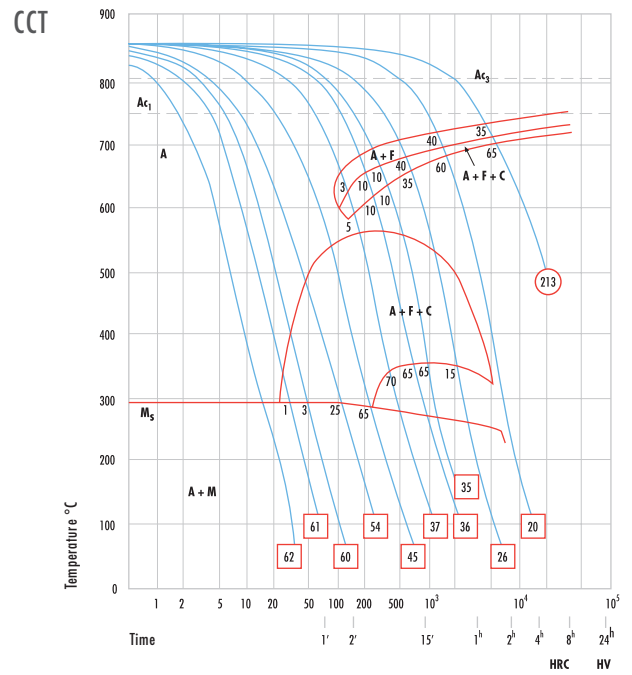
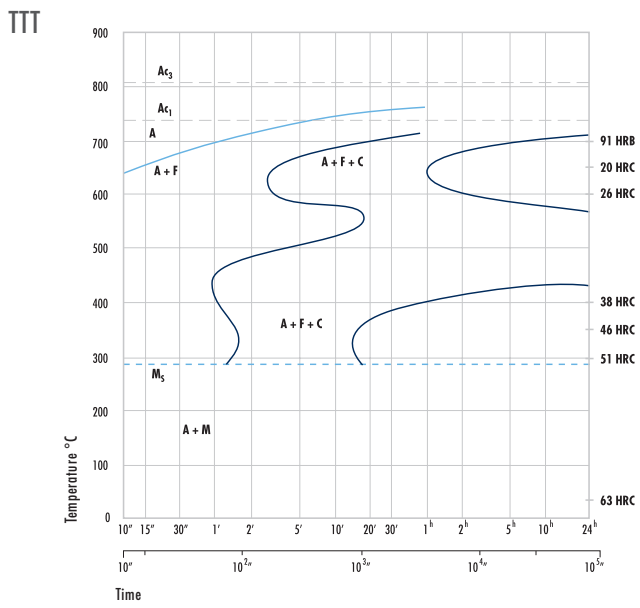
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**QUENCHING AND TEMPERING  
 ALLOYED**
**50CRM04**


**HARDNESS LIMITS (JOMINY TEST)**

Limits of range	Hardness HRC at a distance from quenched end of test pieces (mm)															
	1,5	3	5	7	9	11	13	15	20	25	30	35	40	45	50	
+H	Max	65	65	64	64	63	63	63	62	61	60	58	57	55	54	54
	Min	58	58	57	55	54	53	51	48	45	41	39	38	37	36	36
+HH	Max	65	65	64	64	63	63	63	62	61	60	58	57	55	54	54
	Min	60	60	59	58	57	56	55	53	50	47	45	44	43	42	42
+HL	Max	63	63	62	61	60	60	59	57	56	54	52	51	49	48	48
	Min	58	58	57	55	54	53	51	48	45	41	39	38	37	36	36



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