

**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 10083-2: 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°			
42CrMo4	1.7225	42CrMo4	42CrMo4	1.7225	42 CD 4	708M40	4140
42CrMoS4	1.7227		42CrMoS4	1.7227			

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

EUROPE	C	Si	Mn	P / max	S	Cr	Mo	Cu / max	Al	Pb
42CrMo4					≤ 0,035					-
42CrMoS4	0,38÷0,45	0,10÷0,40	0,60÷0,90	0,025	0,020÷0,040	0,90÷1,20	0,15÷0,30	0,40	0,020÷0,050	-
42CrMoS4Pb					0,020÷0,040					0,15÷0,30

**MECHANICAL PROPERTIES - AS ROLLED CONDITION**

Size mm	HB max to condition		Quenched and tempered (+QT)				
	Treated to improve shearability (+S)*	Soft annealing (+A)	Rp <sub>0,2</sub> (MPa) min	R <sub>m</sub> (MPa)	A <sub>5</sub> (%) min	Z (%) min	KV (J) min
≤ 16	255	241	900	1100÷1300	10	40	-
> 16 ≤ 40	255	241	750	1000÷1200	11	45	35
> 40 ≤ 100	255	241	650	900÷1100	12	50	35
> 100 ≤ 160	255	241	550	800÷950	13	50	35
> 160 ≤ 250	255	241	500	750÷900	14	55	35

\*Depending on the chemical composition of the cast, and on the dimension, particularly in the case of the +HH grades, soft annealing can be necessary

**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	Rp <sub>0,2</sub> (MPa) min	R <sub>m</sub> (MPa)	A <sub>5</sub> (%) min	KV (J) min	Rp <sub>0,2</sub> (MPa) min	R <sub>m</sub> (MPa)	A <sub>5</sub> (%) min	Hardness HB max
≥ 5 ≤ 10	-	-	-	-	-	770	1000÷1200	8	300
> 10 ≤ 16	-	-	-	-	-	750	1000÷1200	8	290
> 16 ≤ 40	241	750	1000÷1200	11	35	720	1000÷1200	9	285
> 40 ≤ 63	241	650	900÷1100	12	35	650	900÷1100	10	280
> 63 ≤ 100	241	650	900÷1100	12	35	650	900÷1100	10	280

\*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



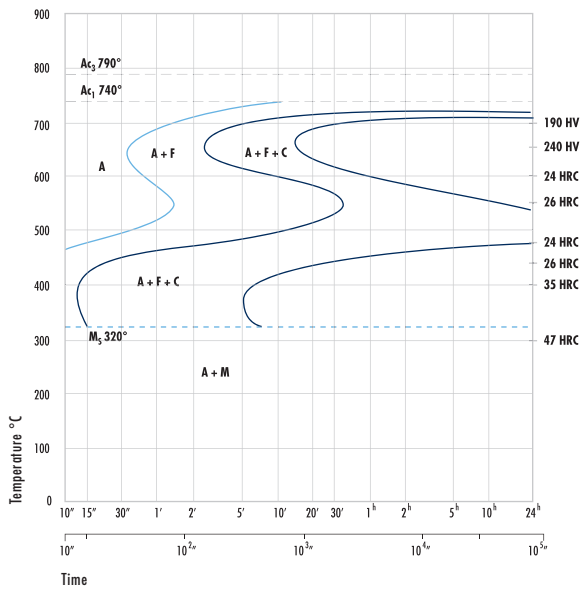
**WORKING TEMPERATURES RECOMMENDED**

Operation	Hot forgings deformation	Isothermal annealing	Soft annealing	Quenching in water or oil	Tempering
°C	850÷1150	830÷860 → 650	680÷720	830÷850	550÷650

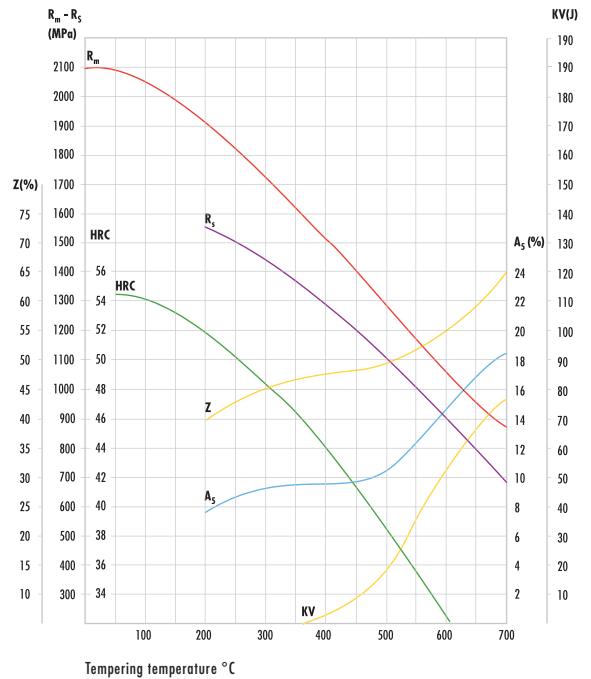
**HARDNESS LIMITS (JOMINY TEST)**

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	61	61	61	60	60	59	59	58	56	53	51	48	47	46	45
	Min	53	53	52	51	49	43	40	37	34	32	31	30	30	29	29
+HH	Max	61	61	61	60	60	59	59	58	56	53	51	48	47	46	45
	Min	56	56	55	54	52	48	46	44	41	39	38	36	36	35	34
+HL	Max	58	58	58	57	56	54	53	51	49	46	44	42	41	40	40
	Min	53	53	52	51	49	43	40	37	34	32	31	30	30	29	29

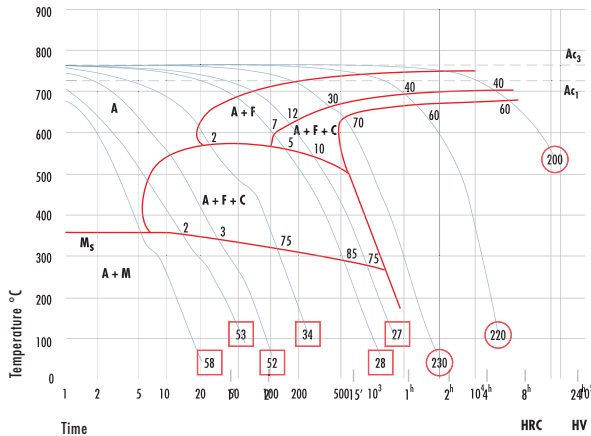
TTT



**TEMPERING CURVE**



CCT



rev. 10/2018

Mark Rodacciai

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**QUENCHING AND TEMPERING**  
**ALLOYED**

**RK1 - RK1PB**

