

**STANDARD REFERENCE:**

UNI EN 10083-3: 2006 (Hot-rolled products) | UNI EN 10277-5: 2008 (Bright products)

**RODACCIAI REFERENCES AND COMPARABLE STANDARDS**

	EUROPE		ITALY	GERMANY		FRANCE	UK	USA
	UNI EN 10083-3: 2006 UNI 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°			
<b>RK4</b>	41Cr4	1.7035	41Cr4	41Cr4	1.7035	42 C 4	530M40	-
<b>RK4S</b>	41CrS4	1.7039		41CrS4	1.7039			

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

	Europe	C	Si / max	Mn	P / max	S	Cr	Al
<b>RK4</b>	41Cr4	0,38÷0,45	0,40	0,60÷0,90	0,025	≤ 0,035	0,90÷1,20	0,020÷0,050
<b>RK4S</b>	41CrS4					0,020÷0,040		

**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	800	1000÷1200	11	30	30
> 16 ≤ 40	255	241	660	900÷1100	12	35	35
> 40 ≤ 100	255	241	560	800÷950	14	40	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	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	295
> 10 ≤ 16	-	-	-	-	750	1000÷1200	8	285
> 16 ≤ 40	241	660	900÷1100	12	670	900÷1100	9	280
> 40 ≤ 63	241	560	800÷950	14	570	800÷950	10	270
> 63 ≤ 100	241	560	800÷950	14	570	800÷950	11	270

\*For reference only \*\*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

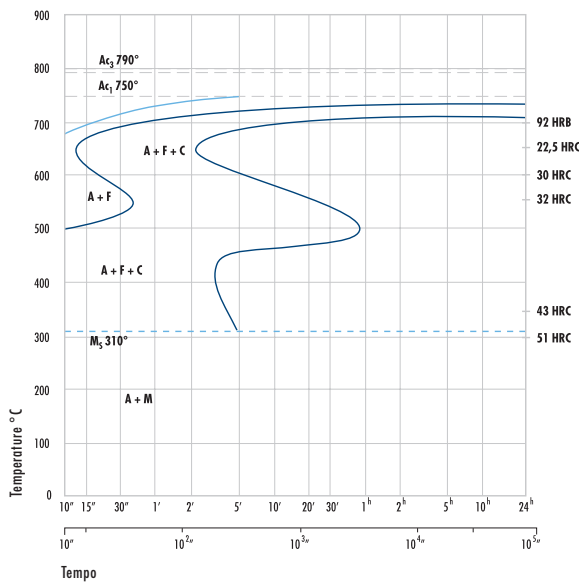
**WORKING TEMPERATURES RECOMMENDED**

Operation	Hot forgings deformation	Isothermal annealing	Soft annealing	Quenching in oil	Tempering
°C	850÷1150	850=880 → 675	680=720	830=860	540=660

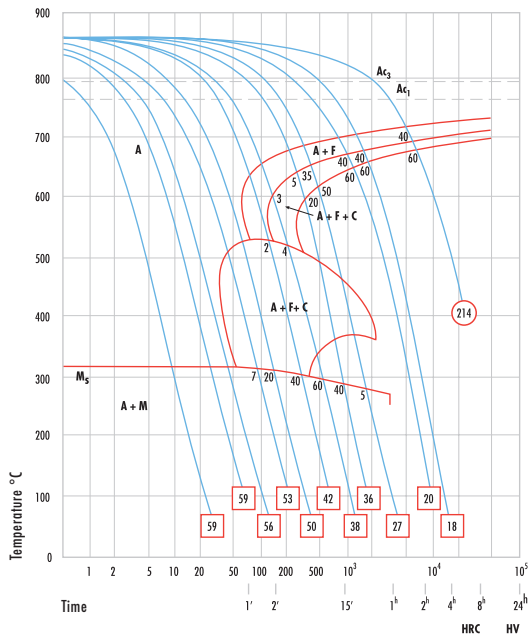
## HARDNESS LIMITS (JOMINY TEST)

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	60	59	58	56	54	52	46	42	40	38	37	36	35
	Min	53	52	50	47	41	37	34	32	29	26	23	21	-	-	-
+HH	Max	61	61	60	59	58	56	54	52	46	42	40	38	37	36	35
	Min	56	55	53	51	47	43	41	39	35	31	29	27	26	25	24
+HL	Max	58	58	57	55	52	50	47	45	40	37	34	32	31	30	29
	Min	53	52	50	47	41	37	34	32	29	26	23	21	-	-	-

### TTT



### CCT



### TEMPERING CURVE

