

**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 10084: 2008		(UNI 7845-78)	(DIN 17200-86)		(NF A 35-552-86)	(BS 970 pt.3-96)	ASTM A 29
Grade	N°		Werkstoff	N°			
34CrMo4	1.7220	35CrMo4	34CrMo4	1.7220	35 CD 4	-	4135
34CrMoS4	1.7226		34CrMoS 4	1.7226			

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

Europe	C	Si	Mn	P /max	S	Cr	Mo	Cu / max	Al	Pb
34CrMo4					≤ 0,035					-
34CrMoS4	0,30÷0,37	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	-
34CrMoS4Pb					0,020÷0,040					0,15÷0,30

**CARATTERISTICHE MECCANICHE LAMINATI**

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) min	A <sub>5</sub> (%) min	Z (%) min	KV (J) min
≤ 16	255	223	800	1000÷1200	11	45	-
> 16 ≤ 40	255	223	650	900÷1100	12	50	40
> 40 ≤ 100	255	223	550	800÷950	14	55	45
> 100 ≤ 160	255	223	500	750÷900	15	55	45
> 160 ≤ 250	255	223	450	700÷850	15	60	45

\* Depending on the chemical composition of the cast, and on the dimension, particularly in the case of the +HH grades, soft annealing may 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	-	-	-	-	-	750	1000÷1200	8	285
> 10 ≤ 16	-	-	-	-	-	720	1000÷1200	8	275
> 16 ≤ 40	223	650	900÷1100	12	40	650	900÷1100	9	270
> 40 ≤ 63	223	550	800÷950	14	45	600	800÷950	10	265
> 63 ≤ 100	223	550	800÷950	14	45	550	800÷950	10	265

\*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



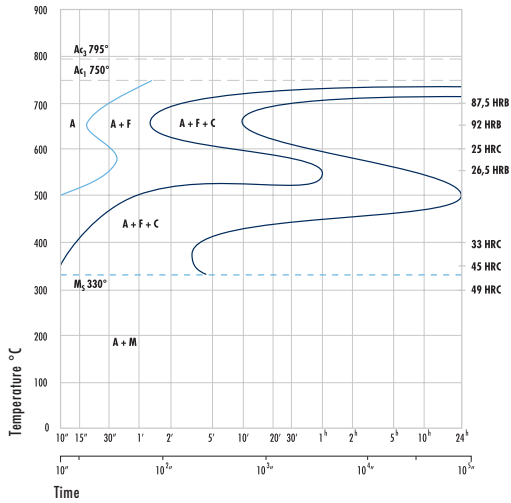
**HARDNESS LIMITS (JOMINY TEST)**

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	57	57	57	56	55	54	53	52	48	45	43	41	40	40	39
	Min	49	49	48	45	42	39	36	34	30	28	27	26	25	24	24
+HH	Max	57	57	57	56	55	54	53	52	48	45	43	41	40	40	39
	Min	52	52	51	49	46	44	42	40	36	34	32	31	30	29	29
+HL	Max	54	54	54	52	51	49	47	46	42	39	38	36	35	35	34
	Min	49	49	48	45	42	39	36	34	30	28	27	26	25	24	24

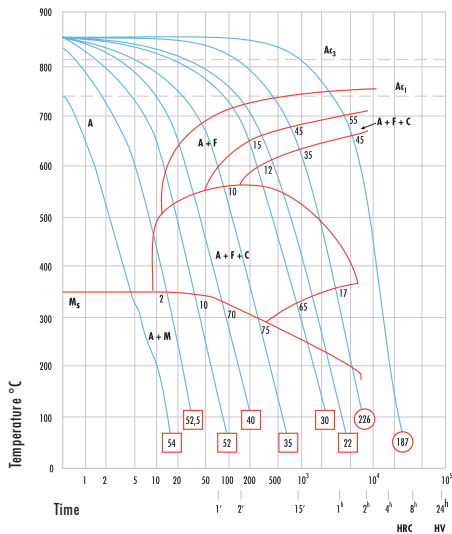
**WORKING TEMPERATURES RECOMMENDED**

Operation	Hot forgings deformation	Isothermal annealing	Soft annealing	Quenching in water or oil	Tempering
°C	850÷1150	830÷870 → 650	680÷720	840÷860	550÷650

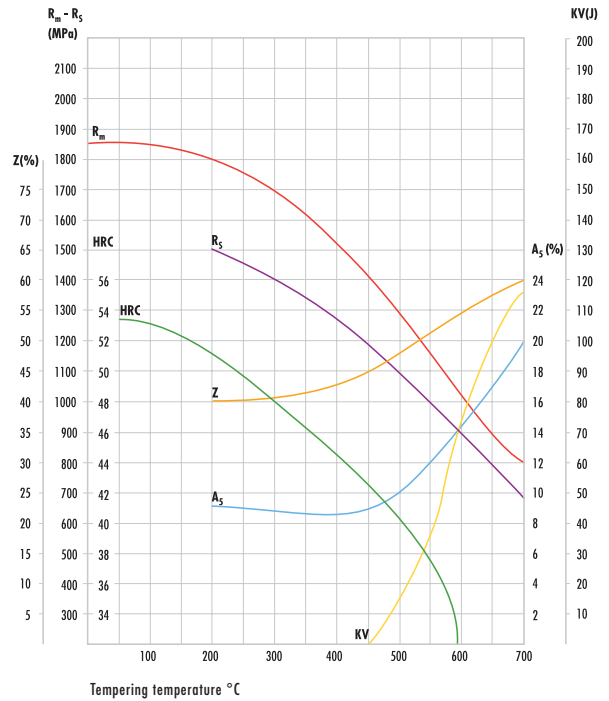
TTT



CCT



TEMPERING CURVE



rev. 10/2018

Mark Rodacciai

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

**RD6 - RD6PB**

