

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 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°			
51CrV4	1.8159	50CrV4	(50CrV4)	1.8159	51CrV4	735A51	(6150)

CHEMICAL COMPOSITION (CAST ANALYSIS) (%)

C	Si	Mn	P / max	S	Cr	V	Cu / max	Al
0,47÷0,55	0,10÷0,40	0,60÷1,00	0,025	≤ 0,035	0,80÷1,10	0,10÷0,25	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 _{p0.2} (MPa) min	R _m (MPa)	A ₅ (%) min	Z (%) min	KV (J) min
≤ 16	-	248	900	1100÷1300	9	40	-
> 16 ≤ 40	-	248	800	1000÷1200	10	45	30
> 40 ≤ 100	-	248	700	900÷1100	12	50	30
> 100 ≤ 160	-	248	650	850÷1000	13	50	30
> 160 ≤ 250	-	248	600	800÷950	13	50	30

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)				Cold Drawn +Quenched+Tempered (+C+QT)			as Rolled+Cold Drawn (+A+C)
	Hardness HB max	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	Hardness HB max
≤ 16	248	900	1100÷1300	9	-	900	1100÷1300	9	311
> 16 ≤ 40	248	800	1000÷1200	10	30	800	1000÷1200	10	293
> 40 ≤ 80	248	780	900÷1100	12	30	780	900÷1100	12	287

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	850÷880 → 675	680÷720	820÷860	540÷680



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	62	62	61	60	58	57	55	54	53	53
	Min	57	56	55	54	53	52	50	48	44	41	37	35	34	33	32
+HH	Max	65	65	64	64	63	62	62	61	60	58	57	55	54	53	53
	Min	60	59	58	57	56	55	54	52	49	47	44	42	41	40	39
+HL	Max	62	62	61	61	60	59	58	57	55	52	50	48	47	46	46
	Min	57	56	55	54	53	52	50	48	44	41	37	35	34	33	32

