

STANDARD REFERENCE:
UNI EN 10084:2008 (Hot-rolled and hot-rolled + turned products) | **UNI EN 10277-4: 2008** (Bright products)

RODACCIAI REFERENCES AND COMPARABLE STANDARDS

	EUROPE		ITALY	GERMANY		FRANCE	UK	USA
	UNI EN 10084: 2008 UNI EN 10277-4: 2008		(UNI 7846-78)	(DIN 17210-84)		(NF A 35-551-86)	(BS 970 pt.1-96)	ASTM A 29
	Grade	N°		Werkstoff	N°			
RM20	20MnCr5	1.7147	20MnCr5	20MnCrS5	1.7149	20 MC 5	-	-
	20MnCrS5	1.7149						

CHEMICAL COMPOSITION (CAST ANALYSIS) (%)

	Europe	C	Si / max	Mn	P / max	S	Cr	Al
RM20	20MnCr5	0,17÷0,22	0,40	1,10÷1,40	0,025	≤ 0,035	1,00÷1,30	0,020÷0,050
	20MnCrS5					0,020÷0,040		

MECHANICAL PROPERTIES - AS ROLLED CONDITION - Hardness (HB) in the condition

Treated to improve sheraability (+S)	Annealed to maximum hardness requirements (+A)	Treated to hardness range (+TH)		Treated to ferrite-pearlite structure and hardness range (+FP)	
≤ 255	≤ 217	≥ 170	≤ 217	≥ 152	≤ 201

MECHANICAL PROPERTIES - BRIGHT PRODUCT CONDITION

Size mm	+A* + Turned (+A +SH)	+A* + Cold drawn (+A+C)	FP** + Turned (+FP +SH)	FP** + Cold drawn (+FP +C)
	Hardness HB max	Hardness HB max	Hardness HB	Hardness HB
≥ 5 ≤ 10	-	270	-	-
> 10 ≤ 16	-	260	-	-
> 16 ≤ 40	217	255	152÷201	152÷250
> 40 ≤ 63	217	250	152÷201	152÷245
> 63 ≤ 100	217	250	152÷201	152÷245

*+A = annealed to maximum hardness requirement

**+FP = treated to ferrite-pearlite structure and hardness range

For size <5 mm the mechanical properties may be agreed at the time of enquiry and order

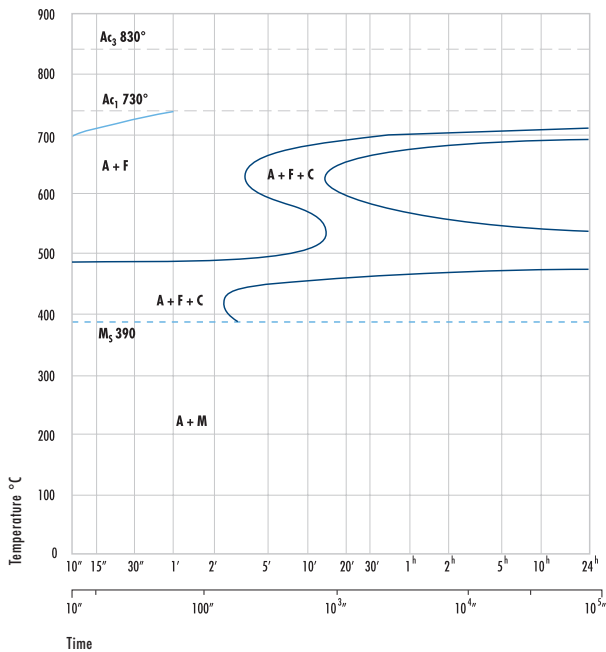
WORKING TEMPERATURES RECOMMENDED

Operation	Hot forgings deformation	Carburizing temperature	Core quenching temperature	Case quenching temperature	Tempering
°C	900÷1150	880÷980	860÷900	780÷820	150÷200

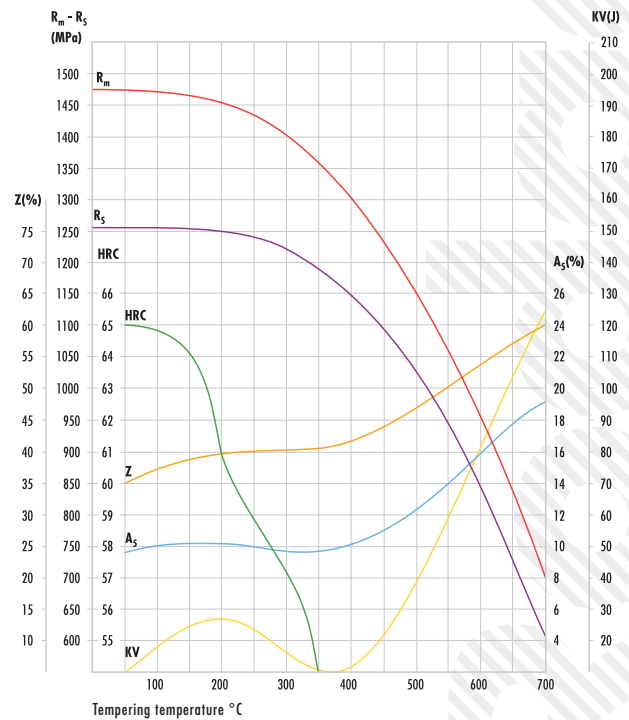
HARDNESS LIMITS (JOMINY TEST)

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	
+H	Max	49	49	48	46	43	42	41	39	37	35	34	33	32
	Min	41	39	36	33	30	28	26	25	23	21	-	-	-
+HH	Max	49	49	48	46	43	42	41	39	37	35	34	33	32
	Min	44	42	40	37	34	33	31	30	28	26	25	24	23
+HL	Max	46	46	44	42	39	37	36	34	32	30	29	28	27
	Min	41	39	36	33	30	28	26	25	23	21	-	-	-

TTT



TEMPERING CURVE



rev. 04/2013

CASE-HARDENING STEELS
ALLOYED

Rodacciai name

RM20

2202