

**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
RCO	Grade	N°		Werkstoff	N°			
	20NiCrMo2-2 20NiCrMoS2-2	1.6523 1.6526	20NiCrMo2	21 NiCrMo 2 21 NiCrMoS 2	1.6523 1.6526	20 NCD 2	805M20	8620

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

	Europe	C	Si / max	Mn	P / max	S	Cr	Mo	Ni	Al
RCO	20NiCrMo2-2	0,17±0,23	0,40	0,65±0,95	0,025	≤ 0,035	0,35±0,70	0,15±0,25	0,40±0,70	0,020±0,050
	20NiCrMoS2-2					0,020±0,040				

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

Treated to improve sherrability (+S)	Annealed to maximum hardness requirements (+A)	Treated to hardness range (+TH)		Treated to ferrite-pearlite structure and hardness range (+FP)	
≤ 255	≤ 212	≥ 161	≤ 212	≥ 149	≤ 194

**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	212	255	149±194	149±240
> 40 ≤ 63	212	255	149±194	149±235
> 63 ≤ 100	212	255	149±194	149±235

\*+A = annealed to maximum hardness requirement

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

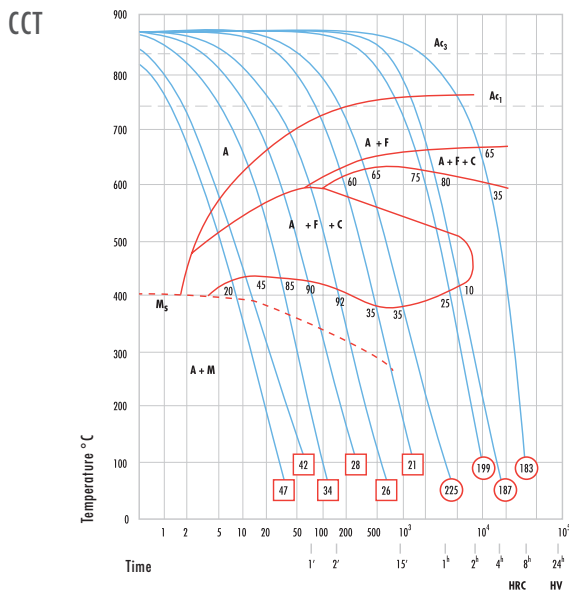
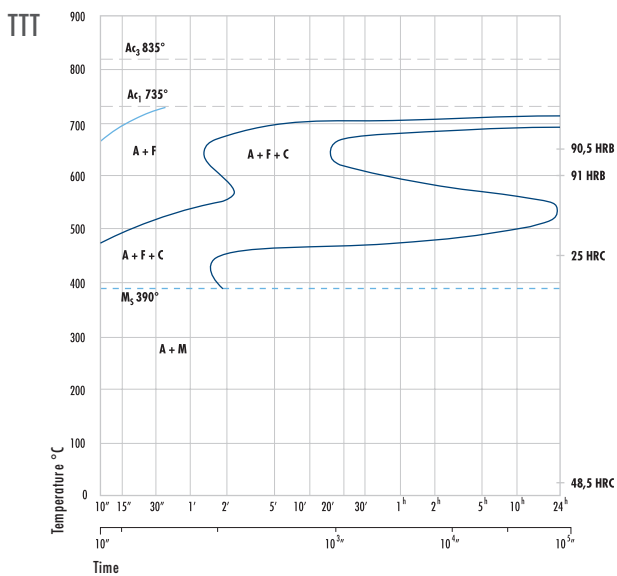
For size <5 mm the mechanical properties may be agreed at the time of enquiry and order

**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	48	45	42	36	33	31	30	27	25	24	24	23
	Min	41	37	31	25	22	20	-	-	-	-	-	-	-
+HH	Max	49	48	45	42	36	33	31	30	27	25	24	24	23
	Min	44	41	36	31	27	24	22	21	-	-	-	-	-
+HL	Max	46	44	40	36	31	29	27	26	23	21	20	20	-
	Min	41	37	31	25	22	20	-	-	-	-	-	-	-



## TEMPERING CURVE

