

STANDARD REFERENCE:
 UNI 5331-64

RODACCIAI REFERENCES AND COMPARABLE STANDARDS

EUROPE		ITALY	GERMANY		FRANCE	UK	USA
EN 10084: 2008 EN 10277-4: 2008		(UNI 5331-64)	(DIN 17210-84)		(NF A 35-551-86)	(BS 970 pt.3 -91)	ASTM A 29
Grade	N°		Werkstoff	N°			
(15NiCr13)	(1.5752)	16NiCr11	-	-	14 NC 11	-	-

CHEMICAL COMPOSITION (CAST ANALYSIS) (%)

C	Si	Mn	P / max	S	Cr	Mo / max	Ni	Al
0,12÷0,18	0,15÷0,40	0,30÷0,60	0,025	0,020÷0,035	0,60÷0,90	0,10	2,50÷3,00	0,020÷0,050

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

Treated to improve sherability (+S)	Annealed to maximum hardness requirements (+A)	Treated to ferrite-pearlite structure and hardness range (+FP)	
≤ 280	≤ 235	≥ 150	≤ 210

*for information only

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	-	-	-	-
> 10 ≤ 16	-	255	-	150÷220
> 16 ≤ 40	235	255	150÷210	150÷220
> 40 ≤ 63	235	255	150÷210	145÷215
> 63 ≤ 100	235	255	150÷210	145÷215

*for reference only **+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

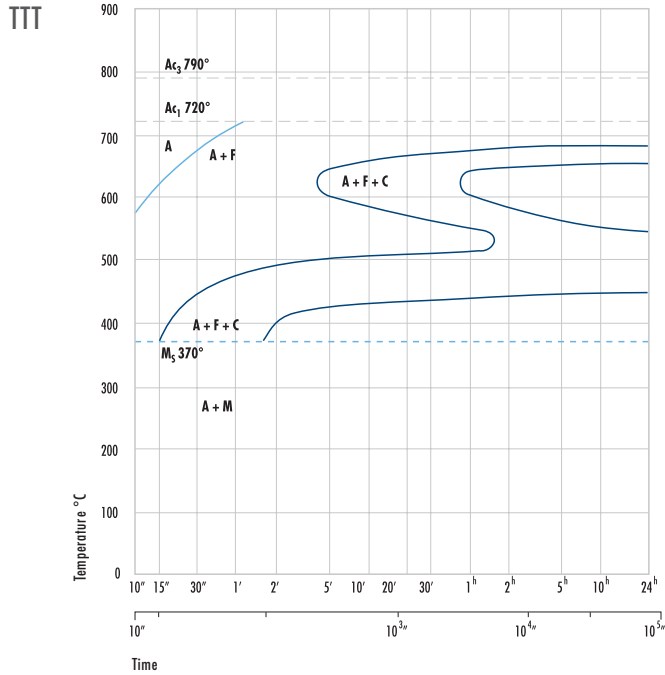
HARDNESS LIMITS (JOMINY TEST)

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	48	46,5	44,5	43	41,5	40	39	37,5	35	32,5	31	29,5	28,5
	Min	39	36,5	34	32	30	28,5	27	26	23,5	21,5	19,5	18	17,5

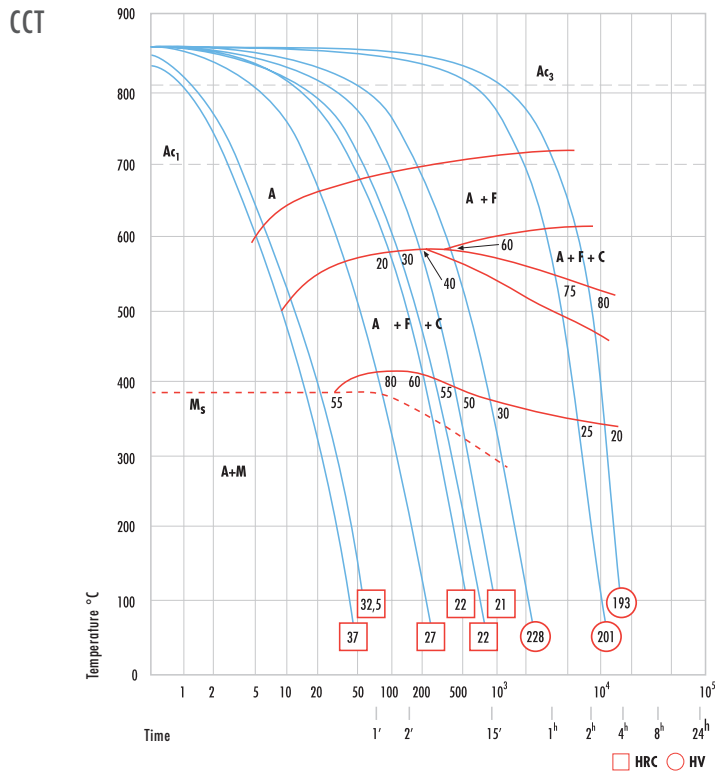
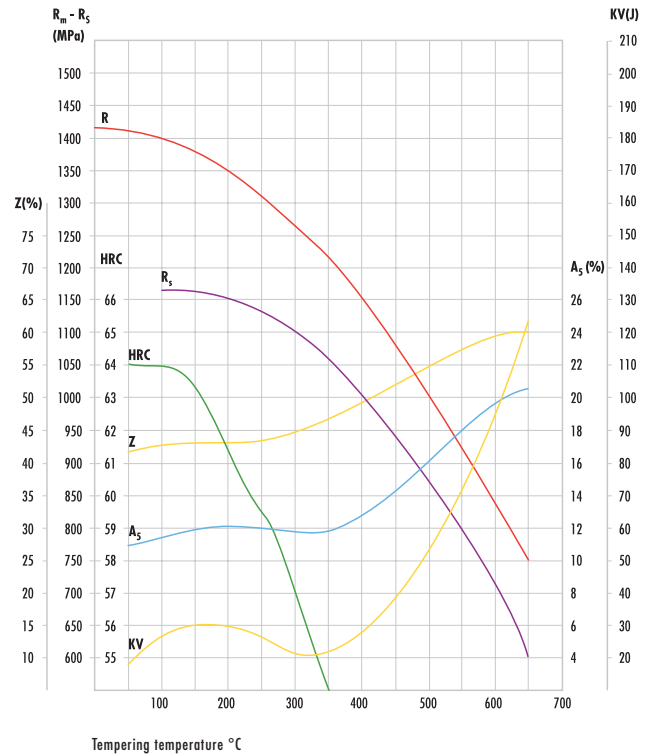


WORKING TEMPERATURES RECOMMENDED

Operation	Hot forgings deformation	Carburizing temperature	Core quenching temperature	Case quenching temperature	Tempering
°C	900÷1150	880÷980	840÷880	780÷820	150÷200



TEMPERING CURVE



rev. 10/2018

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