



### Corrispondenze Comparable standards

SIAU	DIN	W.N.	AFNOR	BS	AIISI/SAE
NCM2	(36CrNiMo4)	(1.6511)	(40NCD3)	-	(9840)

### Composizione Chemical analysis

C	Mn	Si	Cr	Ni	Mo	P e S
.35±.43	.50±.80	.15±.40	.60±1.00	.70±1.00	.15±.25	≤ .035

### Temperature per la lavorazione a caldo ed il trattamento termico Hot work and heat treatment temperatures

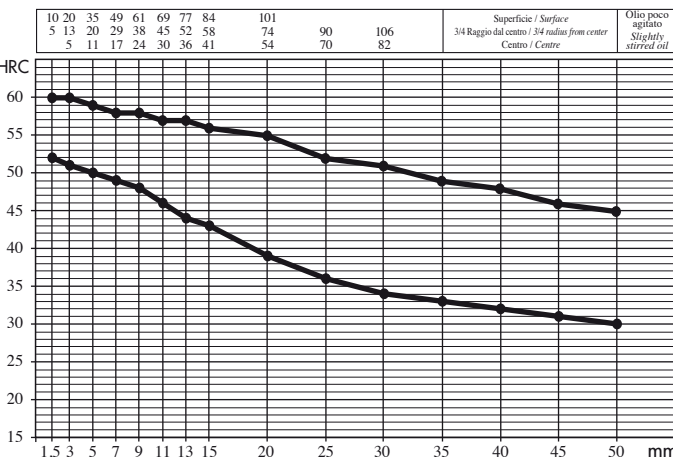
Punti critici Critical points	Fucinatura Forging	Normalizzazione Normalization	Ricottura subcritica Subcritical annealing	Ricottura isotermica Isothermal annealing	Tempra Hardening	Rinvenimento Tempering
Ac1 740				810÷880	830÷860	
Ac3 790	1100÷900	850÷880	650÷700	↓		550÷650
Ms 330				650x3h	olio / oil	

### Caratteristiche meccaniche / Mechanical properties

Stato Condition	Saggio Ø mm. Specimen Ø mm.	Re min. N/mm <sup>2</sup>	Rm N/mm <sup>2</sup>	A min. %	KCU min. J	Durezze HB allo stato HB hardness in the following conditions
	16	785	980±1180	11	30	Ricotto lavorabile / Soft-annealed ≤ 240
Bonificato Hardened and tempered	> 16	735	930±1130	11	30	Ricotto isoteramico / Isothermal annealed 180±240
	> 40	685	880±1080	12	30	Ricotto sferoidale / Spheroidal annealed ≤ 206
	> 100	635	830±980	12	30	
	> 160 ≤ 250	540	740÷880	13	30	

### Temprabilità Hardenability

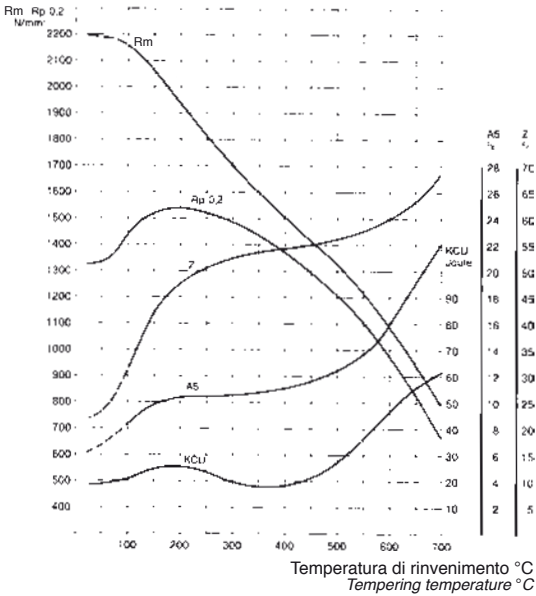
HRC / % Martensite	Diametro temprabile mm. / Hardenable diameter mm.
90%	50%
olio / oil	acqua / water
53	42
	85
	120



### Temprabilità Jominy Jominy hardenability

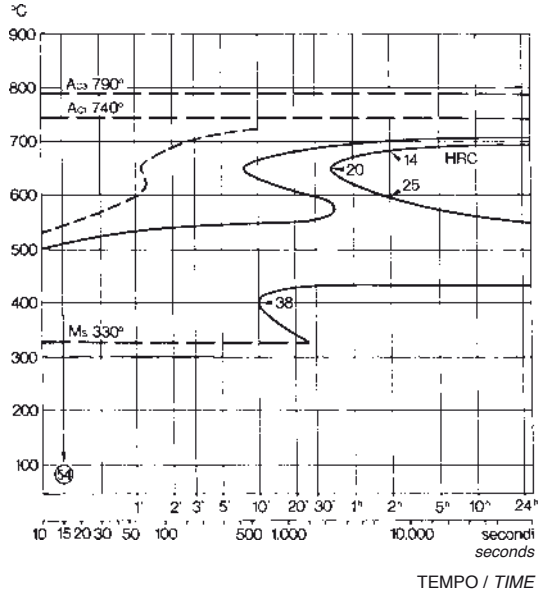
Distanza dall'estremità temprata Distance from quenched end	Durezza Rockwell Rockwell hardness	
mm.	HRC min	HRC max
1,5	52	60
3	51	60
5	50	59
7	49	58
9	48	58
11	46	57
13	44	57
15	43	56
20	39	55
25	36	52
30	34	51
35	33	49
40	32	48
45	31	46
50	30	45

## Diagramma di Rinvenimento Tempering curve



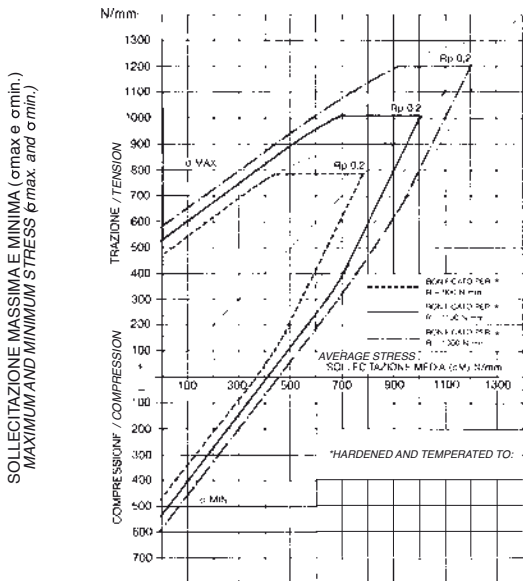
Tratt.: su Ø 11 mm    Tempra: 850 °C olio    Rinv. per 2 ore  
 Treatment: on Ø 11 mm    Hardening: 850 °C oil    Tempering for 2 hours

## Diagramma T.T.T. T.T.T. diagram



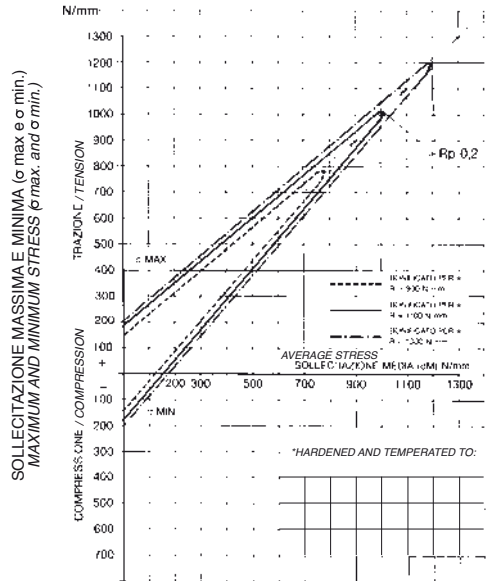
Quadro: 10 mm    Austenizzazione: 850 °C  
 Square: 10 mm    Austenitizing: 850 °C

## Diagramma di Goodman-Smith - Goodman-Smith diagram



Provette non tagliate Ø 10 mm. con superficie speculare (Ra ≤ 0.1 micron)  
 10 mm Ø non-notched test specimens with mirror surface (ra ≤ 0.1 micron)

## Diagramma di Goodman-Smith - Goodman-Smith diagram



Provette Ø 10 mm. con intaglio profondo 0,92 mm e raggio di raccordo a fondo intaglio = 0,21 mm (corrispondente alla filettatura M 10 passo grosso)  
 sollecitazione unitaria calcolata sulla sezione di fondo intaglio.

10 mm diameter test specimens with 0.92 mm deep notch and radius at bottom of notch = 0.21 mm (corresponding to M 10 large pitch thread) unitary stress calculated on the bottom of notch section.