1.2842

Cold working steel

1 Main characteristics and applications

Low hardening distortion and good wear resistance. The chemical composition of this steel permits fairly simple in service heat treatment (low hardening temperature with therefore limited distortion).
Main applications are taps, shear knives, small moulds for plastic materials, gauges, cutting and stamping tools.

2 Comparable standards

UNI	W.Nr	DIN	AFNOR	AISI/SAE	BS
(90Mn-VCr8KU)	1.2842	90MnCrV8	(90MV8)	(O2)	(BO2)

3 Chemical composition (typical; in weight %)

C	Mn	Si	Cr	V
0.90	2	0.30	0.30	0.10

4 Critical points

Ac1	725 °C
Ac3	770 °C
Ms	160 °C

5 Production technology

EAF – LF – VD - Forging – Heat treatment +A

6 US specification

In according to standard EN10228-3 Class 4 and standard SEP 1921 Class E/e

7 Delivery condition

W1.2842 is delivered in annealed condition, with hardness max 230 HB (21 HRC).

8 Physical properties (reference values)

	20°C	100°C	250°C	500°C
Thermal expansion coefficient (10-6/K)	12.1	12.5	12.9	14
Thermal conductivity (W/mk)	45	44.7	44	37.9
Young modulus (Kn/mm2)	212	209	200	175

9 Heat treatment

TREATMENT	TEMPERATURE	HOLDING TIME (HT)	COOLING	COMMENTS
Annealing	Heat to 700 - 720 °C	Min. H.T. for 2 minute /mm	Furnace to 600°C than in air	-
Stress relieving	Heat to 600 - 650 °C	Min. H.T. for 2 minute /mm	Air or furnace	-
Hardening	Heat to 790-820 °C	Min. H.T. for 1 minute /mm	Oil or pressure gas (vacuum)	Quenched hardness surface 63-65 HRC

The average hardness values that can be obtained with hardening in oil from 800 – 820°C are indicated below:

780°C 64 HRC **800°C 65 HRC** **820°C 65 HRC**

And the average hardness values and hardness penetration in oil from 800 – 820°C:

Ømm	40	50	60	70
Hrc surface	65	65	64	64
HRC ½ radius	64	64	63	58
HRC center	64	63	62	52

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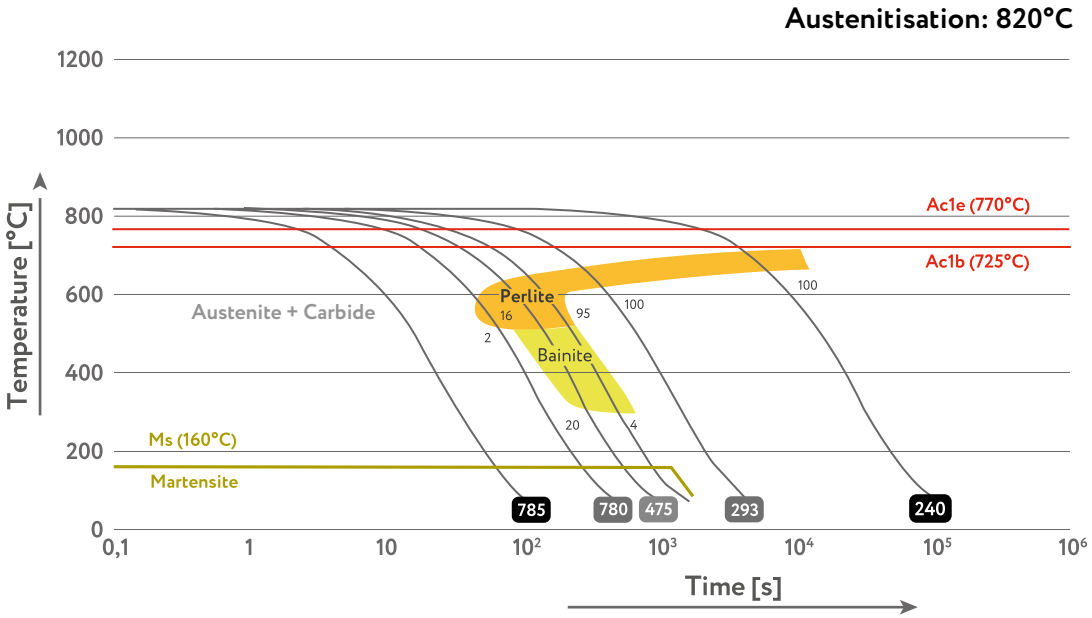
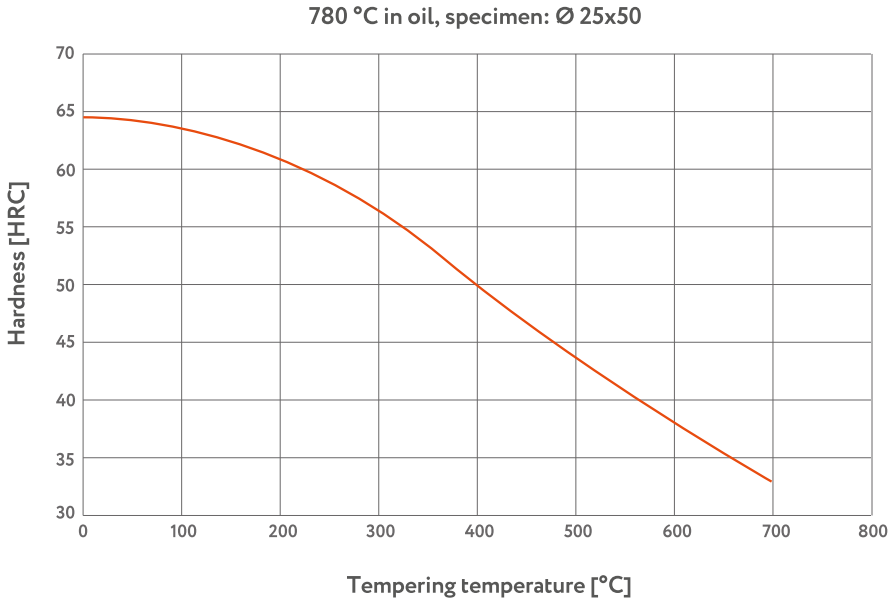
Tempering
• To be carried out in the range 150 – 250°C for at least 2 hours according to hardness requirements and operating conditions
• Cooling in still air
• To achieve maximum stability with tempering at the lower temperature limit, tempering must be repeated several times (at least twice) and for long periods.

10 C.C.T. curve



11 Tempering curve



NLMK Verona S.p.A
Via Antonio Salieri, 22 - 37050 Vallese di Oppeano (VR) - Italy
Tel. : +39 045 69 97 900 - Fax : +39 045 69 97 915
toolsteel.verona@eu.nlmk.com - toolsteels.nlmk.com