

# 1.2714 | HOT WORKING STEEL



## Main characteristics and applications

Ni – Cr – Mo die steel characterized by high level hardenability and toughness, good resistance to repeated thermal and good wear resistance.

Main applications:

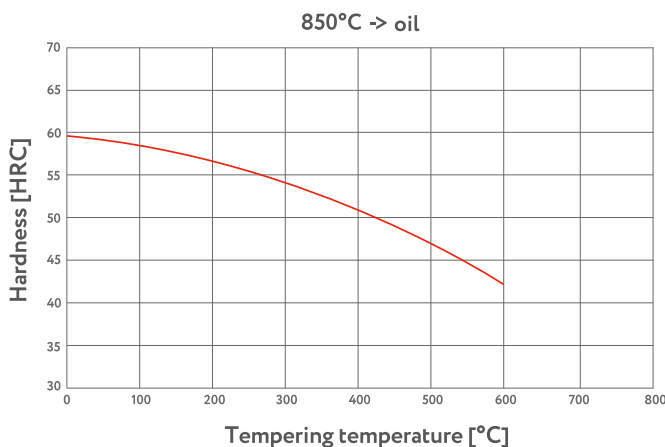
- hammer and press forging dies.
- rams for power hammers.
- hot mill rolls.
- very hard cold work dies and punches.

It is advisable to use the blocks for dies treated at various hardness limits according to the depth cavity complying with the indications given below.

Cavity depth (mm)	HRC	R(N/mm <sup>2</sup> )
20	39÷43	1200/1350
50	36÷42	1100/1320
100	32÷38	980/1170

Before starting machining, preheat the tools to temperatures between 250 – 300°C.

## Tempering curve



## Comparable standards

UNI	W.Nr	DIN	AFNOR	AISI/SAE	BS
(56NiCr-MoV7KU)	1.2714	56NiCr-MoV7	~55NCD07-05	~L6	~224

## Chemical composition (typical; in weight %)

C	Mn	Si	Cr	Ni	Mo	P	S	V
0.52	0.7	0.20	0.75	1,75	0.3	0.025	0.003	0.10

## Critical points

Ac1	Ac3	Ms
730°C	760°C	230°C

## Production technology

EAF – LF – VD - Forging – Heat treatment QT

## US specification

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

## Delivery condition

W1.2714 is delivered in quenched and tempered condition, with hardness range 360 - 410 HB (39 - 44 HRC) or in annealed condition, with hardness max 240 HB (23 HRC)

## Physical properties (reference values)

	20°C	100°C	250°C	500°C
Thermal expansion coefficient (10 <sup>-6</sup> /K)	12.1	12.4	12.9	14.0
Thermal conductivity (W/mk)	36.7	36.9	39.3	35.7
Young modulus (Kn/mm <sup>2</sup> )	212	208	197	175

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## Heat treatment

TREATMENT	TEMPERATURE	HOLDING TIME (HT)	COOLING	COMMENTS	
<b>Annealing</b>	Heat to 700 - 720 °C	Min. H.T. for 2 minute /mm	Air or furnace	In order to obtain hardness lower than 240 HB ( 23 HRC) to improve machinability	
<b>Stress relieving</b>	Heat to 600 - 650 °C (max 30 °C below tempering temperature)	Min. H.T. for 2 minute /mm	Air or furnace	To be carried out after machining, is recommended to eliminate the residual stresses induced by mechanical working	
<b>Hardening</b>	Initial preheating to 350 - 450°C Second preheating to 650 - 750°C Heat to hardening temperature 850 - 870°C and hold at temperature	Min. H.T. for 1 minute /mm	Oil	-	
The average hardness values that can be obtained with hardening in oil in the range 840 - 920°C are given below:					
°C	840	860	880	900	920
HRC	57	58	59	59.5	60
<b>Tempering</b>	Heat to 550 - 630 °C	Min. H.T. for 3 minute /mm	Air or furnace	To be carried out after hardening. 2nd Tempering must be performed to max 30°C below tempering temperature	

## C.C.T. curve

