1.2083 ESR

Plastic mould steel

1 Main characteristics and applications

Martensitic stainless steel with a high hardenability, good polishing properties, excellent resistance to corrosion and rust.

Its applications are plastic moulds, high wear resistance cavities particularly for processing of acid aggressive plastics (i.e. acetate and PVC), or plastics containing abrasive fillers. Suited for the manufacture of transparent plastics such as moulds for optical and medical products.

2 Comparable standards

UNI	W.Nr	DIN	AFNOR	AISI/SAE	BS
X42Cr13	1.2083	X40Cr14	-	420C	-

3 Chemical composition (typical; in weight %)

C	Mn	Si	Cr	P	S
0.40	0.70	0.50	13	0.025	0.003

4 Critical points

Ac1 790 °C
Ac3 850 °C
Ms 165 °C

5 Production technology

Electro - slag - remelting (ESR) - 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

W1.2083 is delivered annealed condition, with hardness max 241 HB (23 HRC).

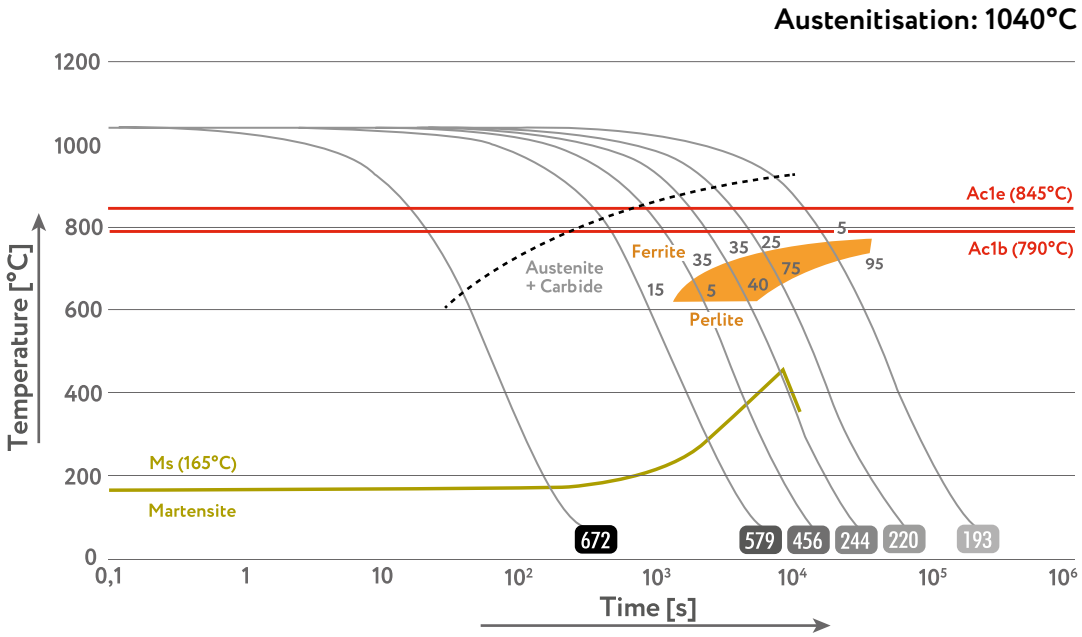
8 Physical properties (reference values)

	20°C	100°C	250°C	500°C
Thermal expansion coefficient (10-6/K)	11.1	11.4	11.8	12.6
Thermal conductivity (W/mk)	20.5	22.1	23.6	25.1
Young modulus (Kn/mm2)	218	210	202	180

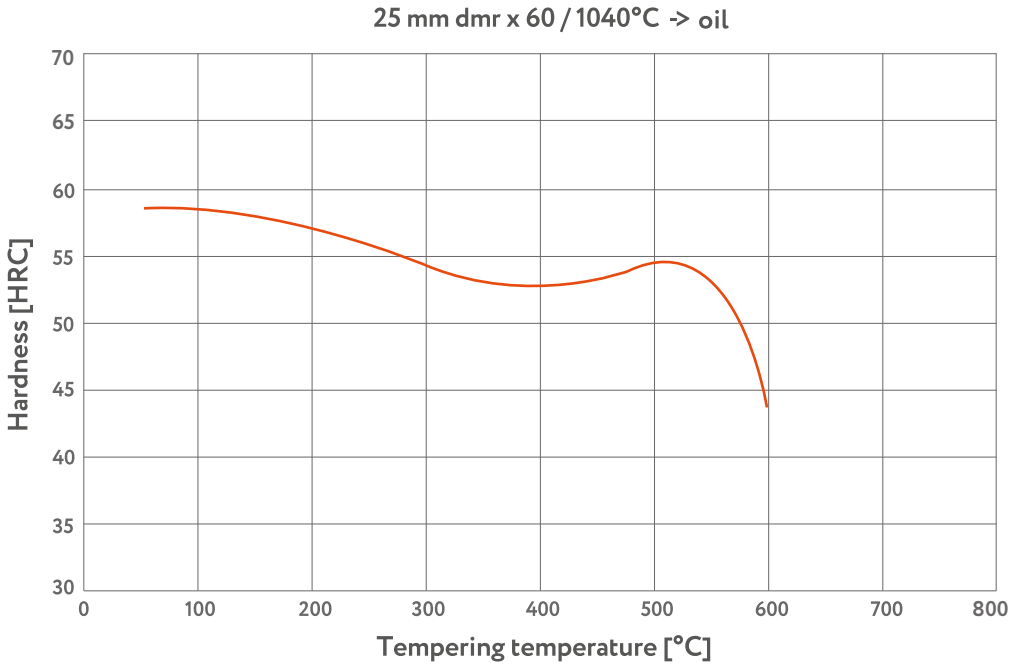
9 Heat treatment

TREATMENT	TEMPERATURE	HOLDING TIME (HT)	COOLING	COMMENTS
Annealing	Heat to 780 - 800 °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
Stress relieving	Heat to 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
Hardening	Heat to 1000-1050 °C	Min. H.T. for 1 minute /mm	Oil – Gas air	-
Tempering	Heat to 170 - 270 °C	Min. H.T. for 3 minute /mm	Air	To be carried out soon after the hardening according to the required hardness; at 170 – 270°C in order to match hardness and resistance to corrosion; permanence for at least 2 hours; tempering must be repeated at least twice at a temperature 30°C lower than the previous

10 C.C.T. curve



11 Tempering curve



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