RADHIKA ALLOYS

1.2311 | P-20 | 40CrMnMo7

1.2311 tool steel is a mould materials for plastic injection, it belong to the high quality medium carbon, Pre-hardness (28~34HRc), Cold work plastic mould steel. It doesn't need further heat treatment. So you don't have any worry about distortion or cracking. 2311 steel is most widely used to plastic mould material in injection plastic mould.

Chemical composition

W.nr	EQUIVALENT		C	Si	Mn	S	P	Cr	Mo
	DIN	AISI/ASTM							
1.2311	40CrMnM07	P20	0.35-0.45	0.20-0.40	1.30-1.60	<0.03	<0.03	1.80-2.10	0.15-0.25

Delivery condition

1.2311 is delivered in quenched and tempered condition, with hardness range 280 - 325 HB (29 - 34 HRC).

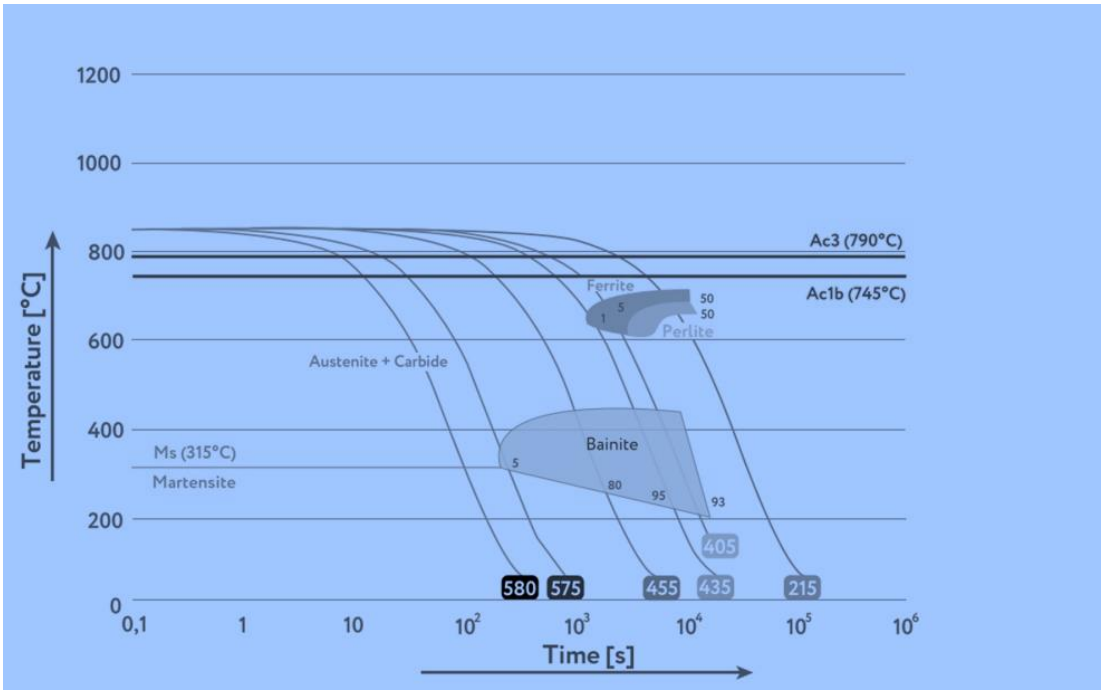
Physical properties (reference values)

Properties	20°C	100°C	250°C	500°C
Thermal expansion coefficient (10-6/K)	12.1	12.4	12.9	14.1
Thermal conductivity (W/mk)	36.1	36.2	36.4	33.5
Young modulus (Kn/mm2)	212	205	200	175

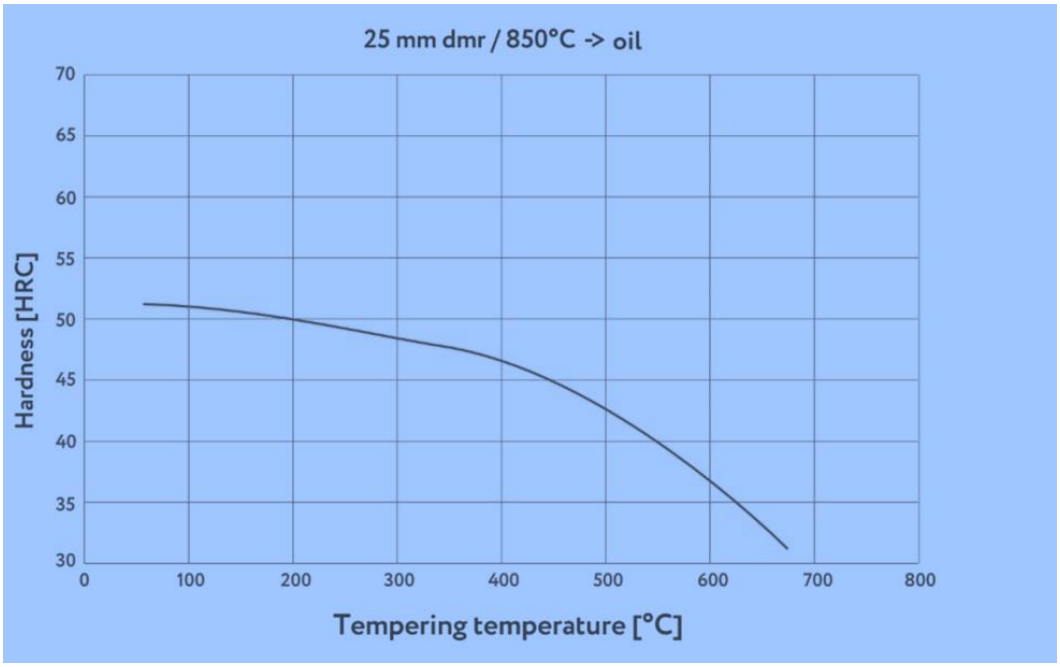
Heat treatment

TREATMENT	TEMPERATURE	HOLDING TIME (HT)	COOLING	COMMENTS
Annealing	Heat to 700 - 720 °C	Min. H.T. for 2 minute /mm	Air or furnace	In order to obtain hardness lower than 250 HB (24 HRC) to improve machinability
Stress relieving	Heat to 560 - 600 °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
Hardening	Heat to 860-880°C	Min. H.T. for 1 minute /mm	Polymer	-
Tempering	In the range 550 – 600°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



Tempering curve



Application

Plastic moulds, die holder, backers, rams for plastic pressure dies, hydro forming mould tools. Bolsters, die holders. Also suitable for other applications such as rails, shafts and wear strips.