M3/2 3344 Steel

Designation by Standards

Mat. No.	DIN	EN	AISI/SAE
1.3344	S6-5-3 †	HS6-5-3	M3/2

Chemical Composition (in weight %)

C	Cr	Mo	Ni	V	W	Others
1.20	4.30	5.10	-	3.30	6.40	-

Description
M3 Type 2 is a tungsten molybdenum high speed tool steel designed to provide the great wear resistance required for severe cutting operations. With a raised C and V content. Because of this the steel has optimum durability and cutting performance.

Applications
It is used for high performance mills, reamers, broaches for processing hard materials as well as in the area of cold work steel e.g. for piercing dies in the manufacture of nuts.

Physical properties (average values) at ambient temperature
Density [g/cm^3]: 8.07

Coefficient of Linear Thermal Expansion 10^{-6} °C^{-1}

20-100°C	20-200°C	20-300°C	20-400°C	20-500°C	20-600°C	20-700°C
11.7	11.9	12.3	12.8	13.0	13.0	13.0

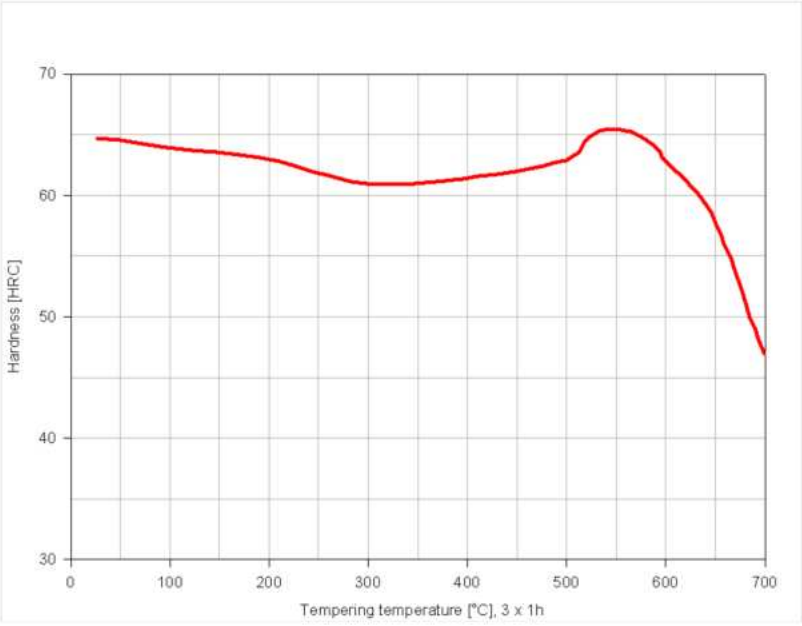
Soft Annealing
Heat to 820-860°C, cool slowly in furnace. This will produce a maximum Brinell hardness of 280.

Hardening
1st pre-heating: 400°C, 2nd pre-heating: 850°C and 3rd pre-heating: 850°C and 1050°C. Harden from a temperature of 1190-130°C followed by oil or air quenching or warm bath at 550°C/air.

Tempering
Tempering temperature: 540-570°C, at least 3 times. Hardness after tempering is 64-66 HRC.

Tempering Temperature (°C) vs. Hardness (HRC)

200°C	300°C	400°C	500°C	525°C	550°C	575°C	600°C	650°C	700°C
63	61	61.5	63	65	65.5	65	63	58	47



Forging

Hot forming temperature: 1100-900°C.

Machinability

M3 type 2 is classified as a "medium" machinability tool steel in the annealed condition. It may be shaped by grinding but is relatively poor in regard to capability of being ground. Its machinability rating is 50% as compared to the W group water hardening steel.

Corrosion Resistance

Not normally employed in applications requiring corrosion resistance.