HOT WORK TOOL STEELS

Application Segments

Hot Work

Available Product Variants

Long Products* | Open Die Forgings

* Presented data refer exclusivly to long products. Please observe the detailed explanations at the end of the data sheet (pdf).

Product Description

BÖHLER W720 VMR is not a classic hot work tool steel, but an ultra-high strength maraging steel. Compared to quenched and tempered steels, the material generates its high strength not through a hardened and tempered martensitic structure with a high carbon content and secondary hardening carbides, but through the precipitation of intermetallic phases from a tough nickel martensitic matrix. BÖHLER W720 VMR corresponds to material number 1.6358 (X2NiCoMoTi18-9-5) and has proven to be ideally suited for many tool steel applications in cold and hot work (e.g., for extrusion stems) up to 450 °C.

Process Melting

VIM + VAR

Applications

- Extrusion
- Injection Molding
- Fasteners, Bolts, Nuts
- General Components for Mechanical Engineering
- High Pressure Die-Casting

Technical data

Material designation	
1.6358	SEL
K93120	UNS

Chemical composition (wt. %)

C	Si	Mn	Mo	Ni	Co	Ti	Al
≤ 0,030	≤ 0,10	≤ 0,10	5.00	18.50	9.00	0.70	0.10

Delivery condition

Solution annealed

Hardness (HB)	max. 353

Solution annealed + precipitation hardened

Ultimate tensile strength (UTS) (MPa)	min. 1900

Heat treatment

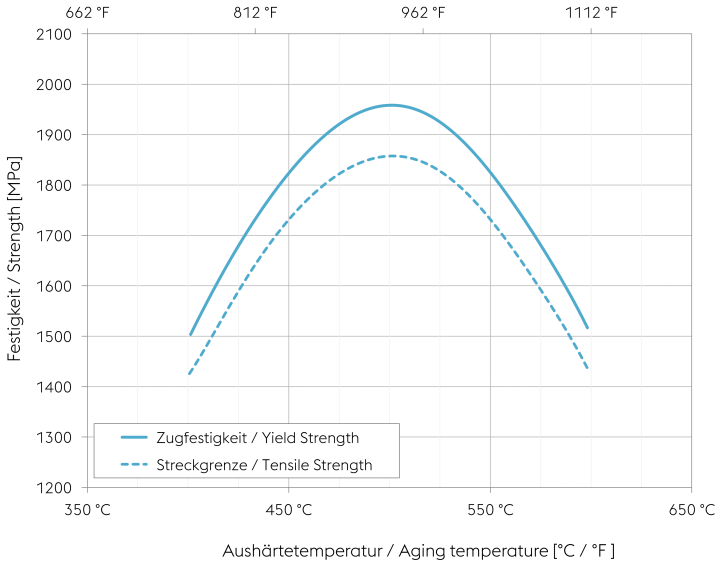
Solution annealing

Temperature	820 °C	1 hour air, gas

Precipitation hardening

Temperature	430 °C	3 hours / air 1720 to 1870 N/mm²
Temperature	480 °C	3 hours / air 1860 to 2000 N/mm²

Ageing chart



Aging:

Solution annealed 820°C (1508°F) / 1 hour / air
Aging time: 3 hours

Physical Properties

Temperature (°C)	**20**
Density (kg/dm³)	8.2
Thermal conductivity (W/(m.K))	14
Specific heat (kJ/kg K)	0.46
Spec. electrical resistance (Ohm.mm²/m)	0.4
Modulus of elasticity (10³N/mm²)	193

Thermal Expansions between 20°C | 68°F and ...

Temperature (°C)	100	200	300	400	500	600
Thermal expansion (10^{-6} m/(m.K))	10.2	10.8	11	11.4	11.8	11.8

voestalpine BÖHLER Edelstahl GmbH & Co KG
Mariazeller Straße 25
8605 Kapfenberg, AT
T. +43/50304/20-0
E. info@bohler-edelstahl.at
https://www.voestalpine.com/bohler-edelstahl/de/

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ONE STEP AHEAD.