

# HOT WORK TOOL STEELS

## Available Product Variants

Long Products

## Product Description

BÖHLER W722 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 W722 VMR corresponds to material number 1.2709 (X3NiCoMoTi18-9-5) and has proven to be ideally suited for many tool steel applications in cold and hot work up to 450 °C. The Steel also is available as powder material for metal-3D-printing under the brand name BÖHLER W722 AMPO.

## Process Melting

VIM + VAR

## Applications

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

## Technical data

Material designation	
1.2709	SEL

## Chemical composition (wt. %)

C	Si	Mn	Mo	Ni	Co	Ti
≤ 0,03	≤ 0,10	≤ 0,15	4.90	18.00	9.30	1.10

## Delivery condition

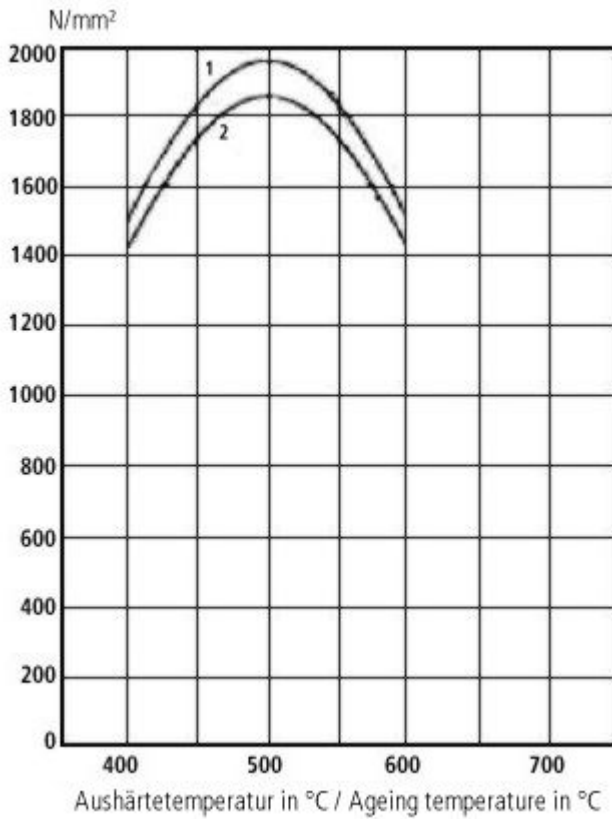
Solution annealed	
Hardness (HB)	max. 353

## Heat treatment

Solution annealing		
Temperature	820 °C   1,508 °F	1 hour air, gas

Precipitation hardening		
Temperature	490 °C   914 °F	6 hours air

Ageing chart



Solution annealed 820°C / 1 hour / air  
 Age hardening: 3h  
 For maximum hardness there is also the possibility to age 6h at 490°C

Physical Properties

Temperature (°C   °F)	20   68
Density (kg/dm <sup>3</sup>   lb/in <sup>3</sup> )	8.1   0.29
Thermal conductivity (W/(m.K)   BTU/ft h °F)	21   12.13
Specific heat (kJ/kg K   BTU/lb °F)	0.42   0.1003
Spec. electrical resistance (Ohm.mm <sup>2</sup> /m   10 <sup>-4</sup> Ohm.inch <sup>2</sup> /ft)	0.42   1.98
Modulus of elasticity (10 <sup>3</sup> N/mm <sup>2</sup>   10 <sup>3</sup> ksi)	200   29.01

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

Temperature (°C   °F)	100   212	200   392	300   572	400   752	500   932
Thermal expansion (10 <sup>-6</sup> m/(m.K)   10 <sup>-6</sup> inch/inch.°F)	10.3   5.7	10.7   5.9	11   6.1	11.3   6.3	11.6   6.4

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For additional specifications and technical requirements, please contact our regional voestalpine BÖHLER sales companies.

*The data contained in this brochure is merely for general information and therefore shall not be binding on the company. We may be bound only through a contract explicitly stipulating such data as binding. Measurement data are laboratory values and can deviate from practical analyses. The manufacture of our products does not involve the use of substances detrimental to health or to the ozone layer.*

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ONE STEP AHEAD.