

HOT WORK TOOL STEELS

Available Product Shapes

- Long Products
- Open Die Forgings

Product Description

Vacuum remelted hot work tool steel with a good temper resistance, but tougher than W403.

Properties

- High toughness & ductility
- High wear resistance
- Good machinability
- High hot hardness
- Mirror finish polishability
- Very high thermal conductivity
- Very high micro-cleanliness
- High resistance to fire cracking
- Excellent homogeneity and isotropy
- Coatable
- Lowest levels of unwanted trace elements
- Can be nitrated

Applications

- > Extrusion
- > Forging (Hot / Semi-hot)
- > General Components for Mechanical Engineering
- > Gravity / Low Pressure Die-Casting
- > High Pressure Die-Casting
- > Injection Molding
- > Press Hardening / Hot Stamping
- > Progressive Forging (Hatebur)
- > Mechanical Engineering / Machine Building General










Technical data

Material designation		Standards	
1.2340	SEL	#207	NADCA
~1.2343			
~T20811	UNS		
~X37CrMoV5-1	EN		
~H11	AISI		
E1810	NADCA		

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	V
0.37	0.2	0.3	5	1.3	0.5

Material characteristics

	High temperature strength	High temperature toughness	High temperature wear resistance	Machinability
	★★	★★★★★	★★	★★★★
	★★	★★★★	★★	★★★★★
	★★	★★★	★★	★★★★★
	★★★	★★★★	★★★	★★★★★
	★★★	★★★	★★★	★★★★★
	★★★★	★★★	★★★★★	★★★★★
	★★★	★★★★★	★★★	★★★★★
	★★★★★	★★★★	★★★★★	★★★★★
	★★★★	★★★★	★★★★	★★★★

Delivery condition

Annealed

Hardness	max. 205 HB
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Heat treatment

Annealing

Temperature (°C °F)	800 1472 to 850 1562	Slow controlled cooling in furnace at a rate of 10 to 20 °C/hr (50 to 68 °F/hr) down to approx. 600 °C (1100°F), further cooling in air.
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Stress relieving

Temperature (°C °F)	600 1112 to 650 1202	Slow cooling in furnace. To relieve stress caused by extensive machining, or for complex shapes. Soak for 1 - 2 hours after temperature equalization (in neutral atmosphere).
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Hardening and Tempering

Temperature (°C °F)	980 1796 to 990 1814	Oil, salt bath (500 - 550 °C [930 - 1020 °F]), air or vacuum with gas quenching. Holding time after temperature equalization: 15 to 30 minutes. In order to prevent coarsening of the grain, hardening must be carried out at the recommended temperature of 980 - 990 °C (1800 - 1815 °F). After hardening, tempering to the desired working hardness, see tempering chart.
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Physical Properties

Temperature (°C °F)	20 68
Density (kg/dm ³ lb/in ³)	7.8 0.28
Thermal conductivity (W/(m.K) BTU (IT) ft/hr/ft ² /F)	31.5 18.2
Specific heat (J/(kg.K) BTU (IT) lb/F)	460 109.87
Spec. electrical resistance (Ohm.mm ² /m 10 ⁻⁴ Ohm.inch ² /ft)	-
Modulus of elasticity (10 ³ N/mm ² 10 ³ ksi)	211 30.65

Thermal Expansions

Temperature (°C °F)									
Thermal expansion (10 ⁻⁶ m/(m.K) 10 ⁻⁶ inch/(inch.F))									

For more information see www.voestalpine.com/boehler-edelstahl

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