

ACCIAI DA UTENSILE PER LAVORAZIONE A CALDO

Granulometria disponibile

Prodotti lunghi*

Forgiatura libera

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

Descrizione del prodotto

Acciaio per lavorazione a caldo con ottime proprietà di resistenza al calore, elevata proprietà di rinvenimento e migliore tenacità, nonché buona resistenza alle cricche termiche, raffreddabile in acqua.

Percorso di fusione

Airmelted

Proprietà

- > Durezza e duttilità : buono
- > Resistenza all'usura : alto
- > Lavorabilità : molto alto
- > Durezza a caldo (durezza rossa) : alto
- > Lucidabilità : buono
- > Conducibilità termica : buono
- > Micropulizia : buono

Applicazioni

- > Estrusione
- > Colata in gravità
- > Forgiatura progressiva (Hatebur)
- > Forgiatura a caldo
- > Pressocolata ad alta pressione
- > Ing. mecc. / Costruzione di macchine Generale
- > Componenti per il settore ingegneria meccanica
- > Formatura a caldo / Stampaggio

Dati tecnici

Corrispondenze		Standard	
1.2367	SEL	4957	EN ISO
X38CrMoV5-3	EN		

Analisi chimica

C	Si	Mn	Cr	Mo	V
0,38	0,40	0,40	5,00	2,80	0,55

Proprietà del materiale

	Resistenza a caldo	Durezza a caldo	Resistenza all'usura a caldo
BÖHLER W303 ISODISC®	★★★★	★★★	★★★★
BÖHLER W300 ISODISC®	★★	★★★	★★
BÖHLER W300 ISOBLOC®	★★	★★★★	★★
BÖHLER W302 ISODISC®	★★★	★★★	★★★
BÖHLER W302 ISOBLOC®	★★★	★★★★	★★★
BÖHLER W320 ISODISC®	★★★	★★	★★★
BÖHLER W350 ISOBLOC®	★★★	★★★★★	★★★
BÖHLER W360 ISOBLOC®	★★★★★	★★★★	★★★★★
BÖHLER W400 VMR®	★★	★★★★★	★★
BÖHLER W403 VMR®	★★★★	★★★★	★★★★

Condizioni di consegna

Ricotto

Durezza (HB)	max. 229
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Hardened and Tempered

Durezza (HRC)	30 a 44
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Trattamento termico

Annealing

Temperatura	750 a 800 °C	Holding time 6 to 8 hours. Slow, controlled furnace cooling at 10 to 20°C/h (50 to 68 °F/hr) to approx. 600°C (1112°F), further cooling in air.
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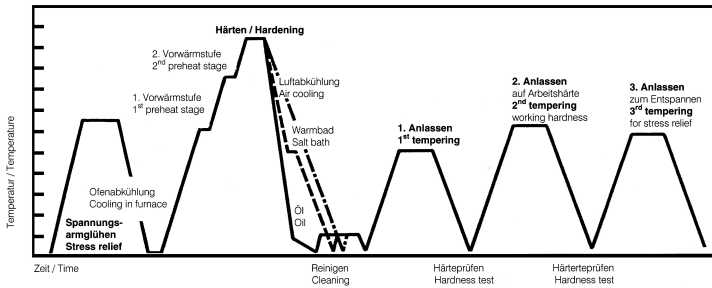
Alleviare lo stress

Temperatura	600 a 670 °C	For stress relief after extensive machining or for complicated tools. Holding time depending on tool size after complete heating 2 - 6 hours in neutral atmosphere. Slow furnace cooling.
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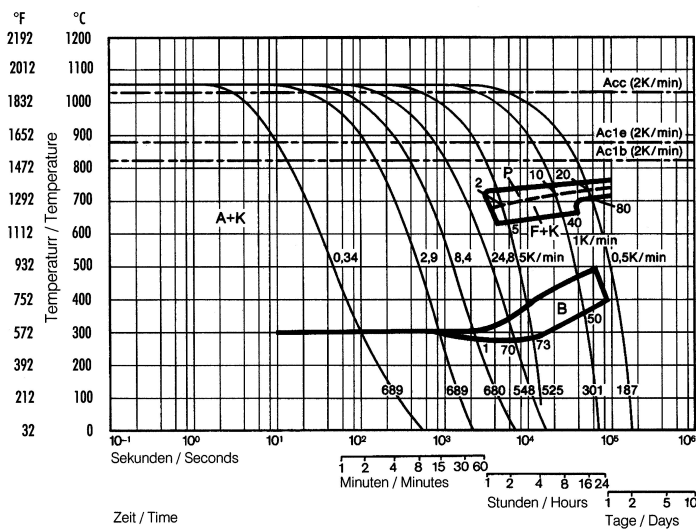
Tempra e rinvenimento

Temperatura	1.030 a 1.080 °C	Holding time after temperature equalization: 15 to 30 minutes; Quenching: Oil, salt bath (500 - 550°C [932-1022°F]), air, vacuum; After hardening, tempering to the desired working hardness (see tempering chart).
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Heat treatment sequence



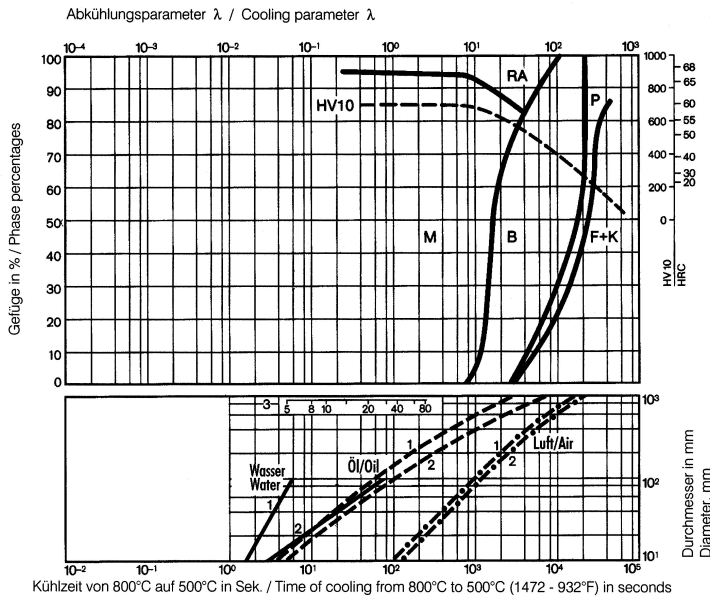
Continuous cooling CCT curves



Austenitising temperature: 1922°F (1050°C)
Holding time: 15 minutes

689 - 187 Vickers hardness
1...80 phase percentages
0.34...24.8 cooling parameter, i.e. duration of cooling from 1472 - 932°F (800-500°C) in $s \times 10^{-2}$
41...32,9°F/min (5...0.5 K/min) cooling rate in °F/min (K/min) in the 1472 - 932°F (800-500°C) range

Quantitative phase diagram

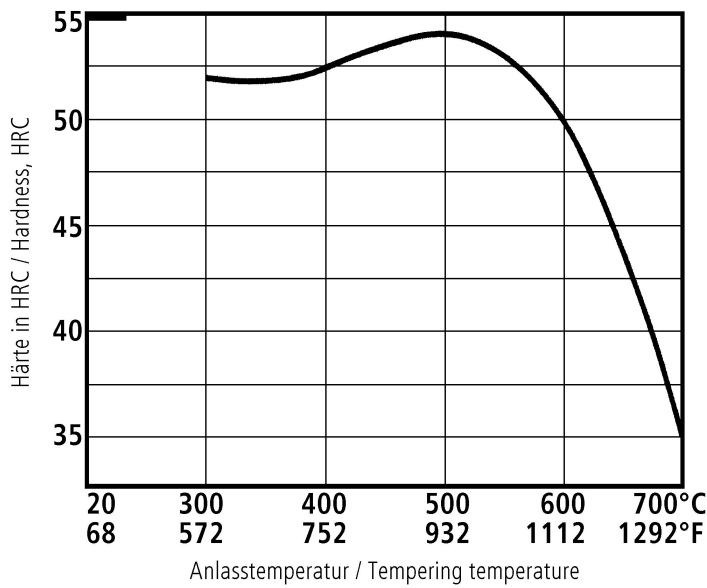


- A... Austenite
- B... Bainite
- F... Ferrite
- K... Carbide
- M... Martensite
- P... Pearlite
- RA... Retained austenite

- - - - Oil cooling
- · - Air cooling

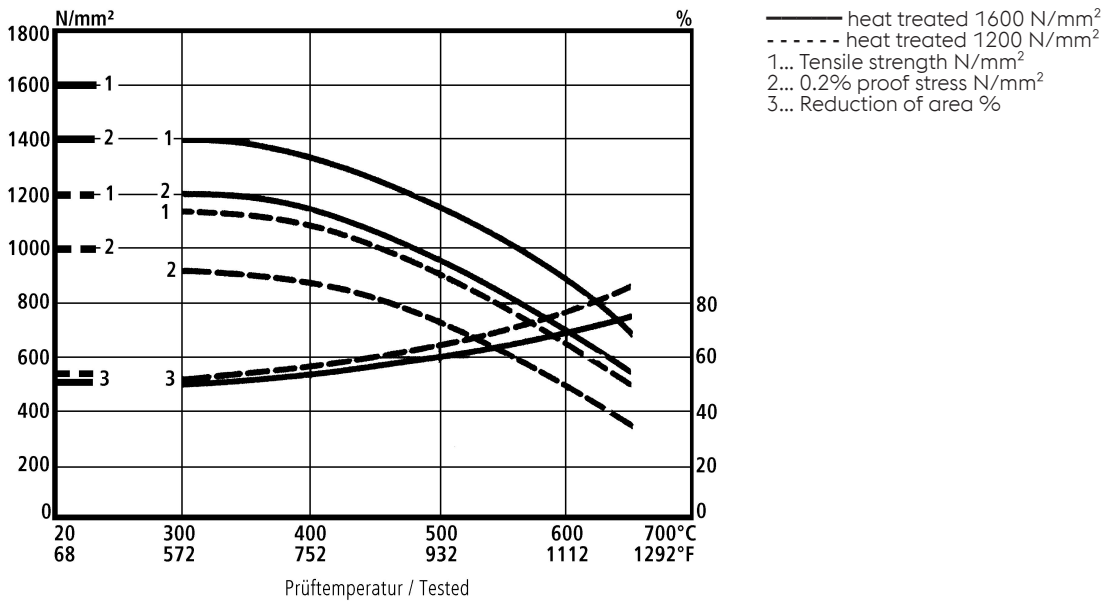
- 1... Edge or face
- 2... Core
- 3... Jominy test: distance from end

Tempering chart



Hardening temperature: 1050°C (1922°F)
Specimen size: square 50 mm

Hot strength chart



Proprietà fisiche

Temperatura (°C)	20
Densità (kg/dm ³)	7,85
Conducibilità termica (W/(m.K))	-
Capacità termica specifica (kJ/kg K)	0,46
Resistenza elettrica specifica (Ohm.mm ² /m)	0,5
Modulo di elasticità (10 ³ N/mm ²)	215

Espansioni termiche

Temperatura (°C)	100	200	300	400	500	600	700
Espansione termica (10 ⁻⁶ m/(m.K))	11,5	12	12,2	12,5	12,9	13	13,2

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

Open Die Forgings: Product Variant may differ in terms of melting process, technical data, delivery, and surface condition as well as available product dimensions. Please contact the business unit Open Die Forgings of voestalpine BÖHLER Edelstahl GmbH & Co KG.

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ONE STEP AHEAD.