

BRZOREZNI ČELICI

Dostupne varijante proizvoda

Šipkasti proizvodi*

Ploče

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

Opis proizvoda

BÖHLER S390 MICROCLEAN – dekatlonac"

Ova klasa čelika je naš PM čelik i odlikuje se brojnim pozitivnim svojstvima u uporabi. Namijenjen za svrdla, ureznice, alate za dubljenje i primjene u hladnom stanju, BÖHLER S390 MICROCLEAN uvijek pruža visoke performanse.

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Put taljenja

Powder metallurgy

Karakteristike

- > Žilavost i duktilnost : visok
- > Otpornost na habanje : visok
- > Tlačna čvrstoća : vrlo visoka
- > Stabilnost rubova : vrlo visoka
- > Mogućnost brušenja : visok
- > Tvrdća pri visokim temperaturama : vrlo visoka

Korištenje

- > Automobilske utrke
- > Glodala
- > Oblikovanje utiskivanjem praškastih materijala
- > Posebni rezni alati
- > Pill punching dies
- > Strugači i razvrtači
- > Precizno štancanje / štancanje / pečačenje
- > Valjanje
- > Svrdla i konusi
- > Hladno oblikovanje / utiskivanje
- > Izrezivanje zupčanika, alati za brijanje i oblikovanje
- > Rezanje / strojni noževi
- > Potrošni dijelovi

Kemijski sastav

C	Cr	Mo	V	W	Co
1,64	4,80	2,00	4,80	10,40	8,00

Materijal

	Kapacitet tlaka	Brušenje	Vruća tvrdoća	Žilavost	Otpornost na habanje	Točnost rezanja
BÖHLER S390 MICROCLEAN	★★★★	★★★	★★★★	★★★★	★★★★	★★★★
BÖHLER S290 MICROCLEAN	★★★★★	★	★★★★	★★	★★★★★	★★★★
BÖHLER S393 MICROCLEAN	★★★★	★★★	★★★★	★★★★	★★★★	★★★★
BÖHLER S590 MICROCLEAN	★★★★	★★★	★★★★	★★★	★★★	★★★
BÖHLER S592 MICROCLEAN	★★★★	★★★	★★★★	★★★	★★★	★★★
BÖHLER S690 MICROCLEAN	★★★	★★★	★★	★★★★★	★★★	★★
BÖHLER S692 MICROCLEAN	★★★	★★★	★★	★★★★★	★★★	★★
BÖHLER S790 MICROCLEAN	★★★	★★★	★★	★★★★	★★	★★★
BÖHLER S792 MICROCLEAN	★★★	★★★	★★	★★★★	★★	★★★
BÖHLER S793 MICROCLEAN	★★★	★★★	★★★★	★★★	★★★	★★★

Isporuka

Annealed

Tvrdoća (HB)	max. 320 drawn execution max. 320 HB
Vlačna čvrstoća (MPa)	max. 1.080

Hardened and Tempered

Tvrdoća (HRC)	64 do 68
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Toplinska obrada

Annealing

Temperatura	770 do 840 °C	4 h controlled slow cooling in furnace (10 to 20°C/h / (50 to 68°F/h) to 740°C/2h (1364°F/2 h) cooling in furnace,
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Stress relieving

Temperatura	600 do 650 °C	Slow cooling in furnace. To relieve stresses set up by extensive machining or in tools of intricate shape. After through heating, hold in neutral atmosphere for 1 to 2 hours.
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Hardening and Tempering

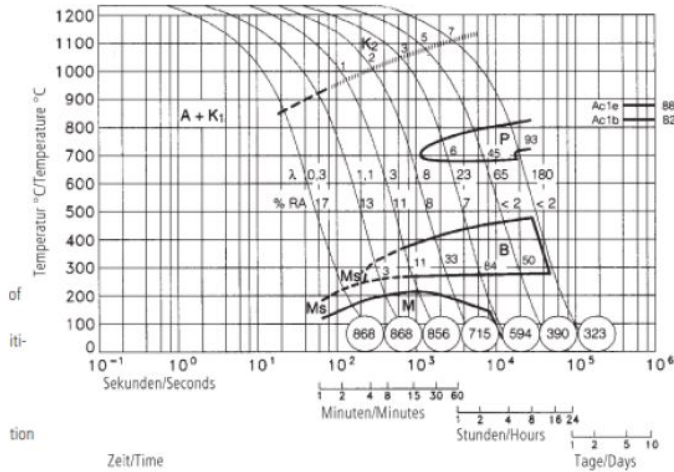
Temperatura	1.100 do 1.230 °C	Salt bath, vacuum Preheating: 1st stage ~ 500 °C (930 °F), 2nd stage ~ 850 °C (1560 °F), 3rd stage ~ 1050 °C (1920 °F) Austenitising: 1100 - 1230 °C (2012 °F - 2246 °F), holding time after complete heating 80 seconds, maximum 150 seconds, to avoid material damage due to overheating. Quenching: oil, warm bath (500 - 550 °C (930 °F - 1020 °F)), gas
Temperatura	550 do 570 °C	Slow heating to tempering temperature immediately after austenitising. Holding time in the furnace 1 hour per 20 mm material thickness (at least 1 hour) Slow cooling to room temperature between each tempering step 3 tempering cycles recommended Hardness see tempering chart

Continuous cooling CCT curves

Austenitising temperature: 1230°C
Haltedauer: 180 Sekunden

Austenitising temperature: 1230°C (2246°F)
Holding time: 180 seconds

Austenitising temperature: 1230°C (2246°F)
Holding time: 180 seconds

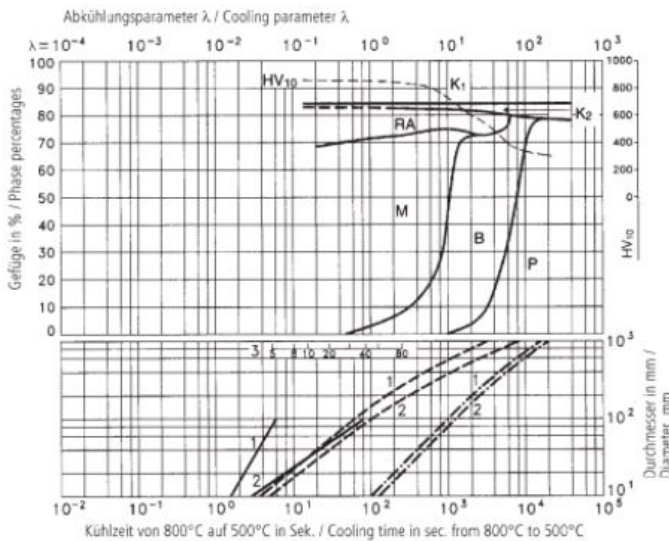


A....Austenite
B....Bainite
K....Carbide
P....Pearlite
M....Martensite
RA...Retained Austenite

Quantitative phase diagram

Austenitising temperature: 1230°C
Haltedauer: 180 Sekunden

Austenitising temperature: 1230°C (2246°F)
Holding time: 180 seconds

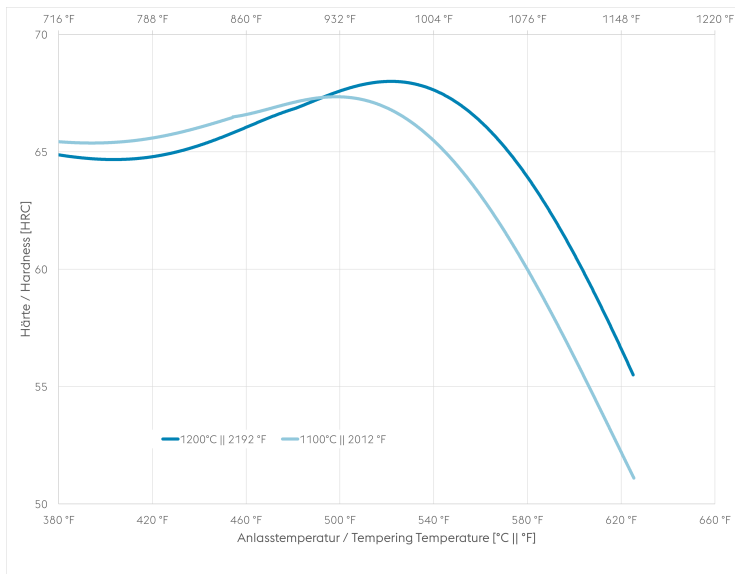


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1....Edge or Face
2....Core
3....Jominy test: distance from quenched end

— watercooling
- - oilcooling
- · - aircooling

Tempering Chart



Holdingtime 3x2 hours

Specimensize: square 25mm

Austenitising in vacuum

Fizička svojstva

Temperatura (°C)	20
Gustoća (kg/dm ³)	8,1
Toplinska vodljivost (W/(m.K))	17
Specifični toplinski kapacitet (kJ/kg K)	0,42
Spec. Otpornik (Ohm.mm ² /m)	0,61
Modul elastičnosti (10 ³ N/mm ²)	231

Toplinska ekspanzija

Temperatura (°C)	100	200	300	400	500	600	700
Toplinska ekspanzija (10 ⁻⁶ m/(m.K))	10	10,5	10,8	11,2	11,3	11,4	11,6

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

Sheet & Plates: Product Variant may differ in terms of melting process, technical data, delivery, and surface condition as well as available product dimensions. Please contact voestalpine BÖHLER Bleche GmbH & Co KG.

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