

OCELE PRE PRÁCU ZA STUDENA

Dostupné výrobné profily

[Tyčové polotovary*](#)[Plechý](#)

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

Popis produktu

Upínacie nástroje (klieštiny, trne, sklučovadlá), nože nožníc, dierovadlá, priebojníky, narážacie trne, vytlačacie kolíky, jamkáre, skrutkovače, kladivá.

Spôsob výroby

[Konvenčná výroba](#)

Vlastnosti

- > Húževnatosť a odolnosť proti plastickej deformácii : veľmi vysoká
- > Pevnosť v tlaku : dobré
- > Rozmerová stabilita : dobré
- > Pevnosť v ťahu / Medza klzu : vysoká

Aplikácia

- > Tvárnenie za studena
- > Diely pre všeobecné strojárstvo
- > Výroba normalizovaných dielov (strižníky, platne, kolíky, razníky)
- > Komponenty pre recykláciu

Technické údaje

| Označenie materiálu | |
|---------------------|-----|
| 1.2101 | SEL |
| 62SiMnCr4 | EN |

Chemické zloženie

| C | Si | Mn | Cr |
|------|------|------|------|
| 0,63 | 1,10 | 1,10 | 0,60 |

Porovnanie vlastnosti materiálu

| | Odolnosť proti tlakovému zaťaženiu | Rozmerová stabilita počas tepelného spracovania | Húževnatosť | Odolnosť proti abrazívnemu opotrebovaniu |
|--------------------|------------------------------------|---|-------------|--|
| BÖHLER K245 | ★★ | ★ | ★★★★★ | ★ |
| BÖHLER K455 | ★★★ | ★ | ★★★★★ | ★ |
| BÖHLER K460 | ★★★★ | ★ | ★★★★ | ★★ |
| BÖHLER K720 | ★★ | ★ | ★★★★ | ★ |

Stav pri dodaní

Žiháný

| | |
|--------------|----------|
| Tvrdosť (HB) | max. 235 |
|--------------|----------|

Tepelné spracovanie

Žihanie

| | | |
|---------|---------------|---|
| Teplota | 710 až 750 °C | Slow controlled cooling in furnace at a rate of 50 to 68°F/hr (10 to 20°C/hr) down to approx. 1112°F (600°C), further cooling in air. |
|---------|---------------|---|

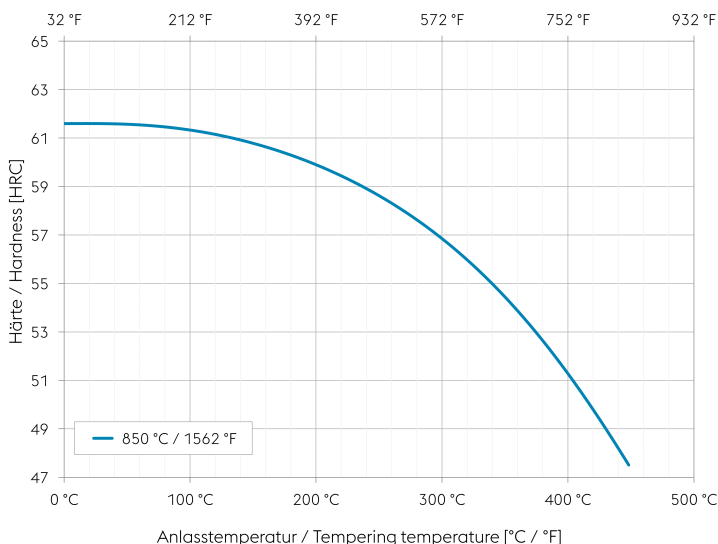
Žihanie na odstránenie pnutí

| | | |
|---------|--------|--|
| Teplota | 650 °C | Slow cooling in furnace; Intended to relieve stresses set up by extensive machining, or in complex shapes. After through heating, hold in neutral atmosphere for 1 to 2 hours. |
|---------|--------|--|

Kalenie a popúšťanie

| | | |
|---------|---------------|--|
| Teplota | 830 až 860 °C | Oil, salt bath (for small sizes) Holding time at hardening temperature: 15 to 30 minutes. After hardening, tempering to the desired working hardness, see tempering chart. |
|---------|---------------|--|

Tempering chart



Tempering:

Specimen size: square 0,787 inch (20 mm)

Slow heating to tempering temperature immediately after hardening.

Time in furnace 1 hour for each 0,787 inch (20 mm) of workpiece thickness but at least 2 hours.

Slow cooling to room temperature after each tempering step is recommended.

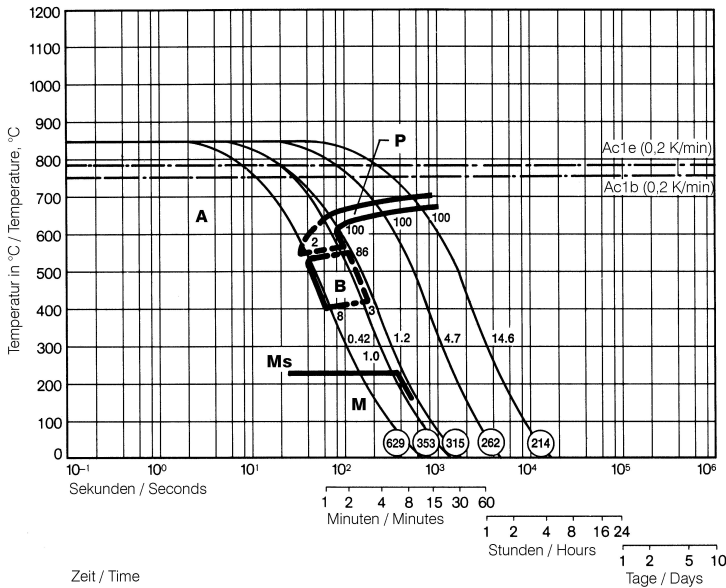
1. Tempering at 392 to 482 °F (200 to 250 °C) to working hardness

2. Partial tempering at 932 to 1022 °F (500 to 550 °C) to spring hardness

Please refer to the tempering chart for guide values for the hardness achievable after tempering.

Tempering for stress relieving 86 to 122 °F (30 to 50 °C) below the highest tempering temperature.

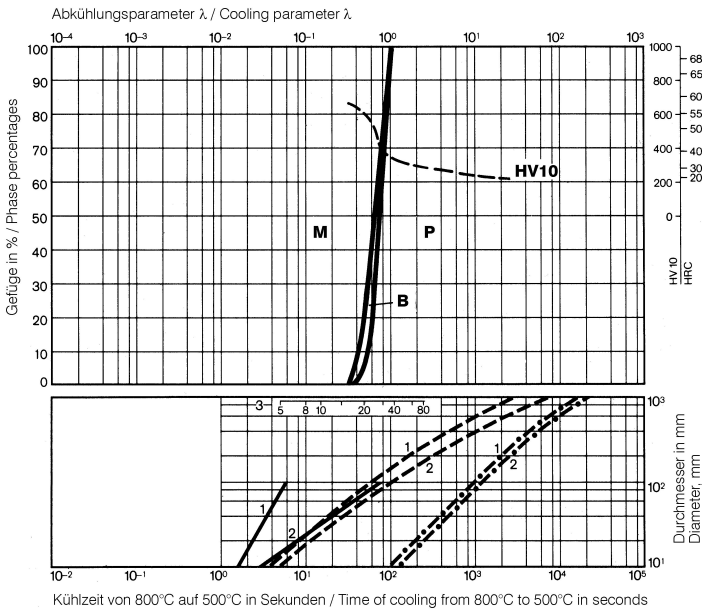
Continuous cooling CCT curves



Austenitising temperature: 845°C / 1553°F
Holding time: 15 minutes

O Vickers hardness
2...100 phase percentages
0.42...14.6 cooling parameter, i.e. duration of cooling from 800°C to 500°C (1472°F to 932°F) in $s \times 10^{-2}$

Quantitative phase diagram

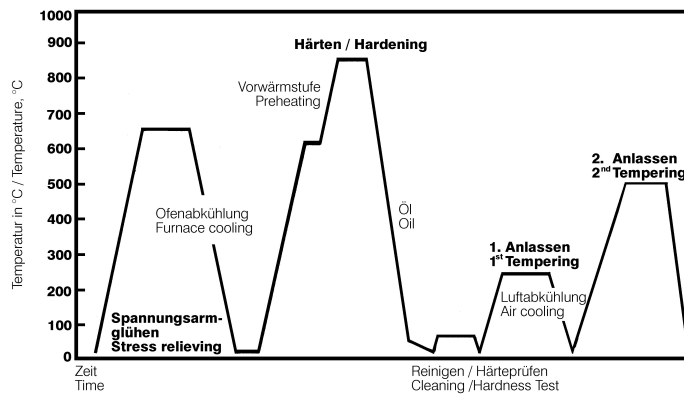


A... Austenite
B... Bainite
P... Pearlite
M... Martensite

— Watercooling
- - - Oil cooling
- · - Air cooling

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

Heat treatment sequence



Fyzikálne vlastnosti

| | |
|--|------|
| Teplota (°C) | 20 |
| Hustota (kg/dm ³) | 7,7 |
| Tepelná vodivosť (W/(m.K)) | 30 |
| Merná tepelná kapacita (kJ/kg K) | 0,46 |
| Merný elektrický odpor (Ohm.mm ² /m) | 0,35 |
| Modul pružnosti (10 ³ N/mm ²) | 210 |

Tepelná roztažnost

| Teplota (°C) | 100 | 200 | 300 | 400 | 500 |
|---|------|------|------|------|-----|
| Tepelná roztažnost (10 ⁻⁶ m/(m.K)) | 12,4 | 12,1 | 12,6 | 12,8 | 13 |

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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