

# KOUDVERVORMSTAAL

## Beschikbare uitvoeringen

Stafstaal\*

Plaat

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

## Product omschrijving

Snijdgereedschappen (matrijzen en stempels), stansgereedschappen, draadsnijgereedschappen, gereedschappen voor houtbewerking, machinemessen in de hout-, papier- en metaalindustrie, meetwerktuigen, kunststofmatrijzen.

## Smeltroute

Airmelted

## Eigenschappen

- > Taaiheid & Vervormbaarheid : hoog
- > Slijtageweerstand : goed
- > Samenpersende sterkte : zeer hoog
- > Dimensionale stabiliteit : goed
- > Slijpbaarheid : hoog

## Toepassingen

- > Cold Forming
- > Fijn stanswerk / ponsen / stampen
- > Standaardonderdelen (matrijzen, platen, pennen, ponsen)

## Technische gegevens

| Materiaal aanduiding |      | Normen |        |
|----------------------|------|--------|--------|
| 1.2510               | SEL  | 4957   | EN ISO |
| T31501               | UNS  | A681   | ASTM   |
| 100MnCrW4            | EN   |        |        |
| O1                   | AISI |        |        |
| ~SKS3                | JIS  |        |        |

## Chemische samenstelling

| C    | Si   | Mn   | Cr   | V    | W    |
|------|------|------|------|------|------|
| 0,95 | 0,25 | 1,10 | 0,55 | 0,10 | 0,55 |

### Materiaaleigenschappen

|                    | Drukbelastingcapaciteit | Dimensionale stabiliteit tijdens warmtebehandeling | Taatheid | Slijtvast abrasief |
|--------------------|-------------------------|--|----------|--------------------|
| <b>BÖHLER K460</b> | ★★★★                    | ★  | ★★★★     | ★★                 |
| <b>BÖHLER K245</b> | ★★                      | ★  | ★★★★★    | ★                  |
| <b>BÖHLER K455</b> | ★★★                     | ★  | ★★★★★    | ★                  |
| <b>BÖHLER K720</b> | ★★                      | ★  | ★★★★     | ★                  |

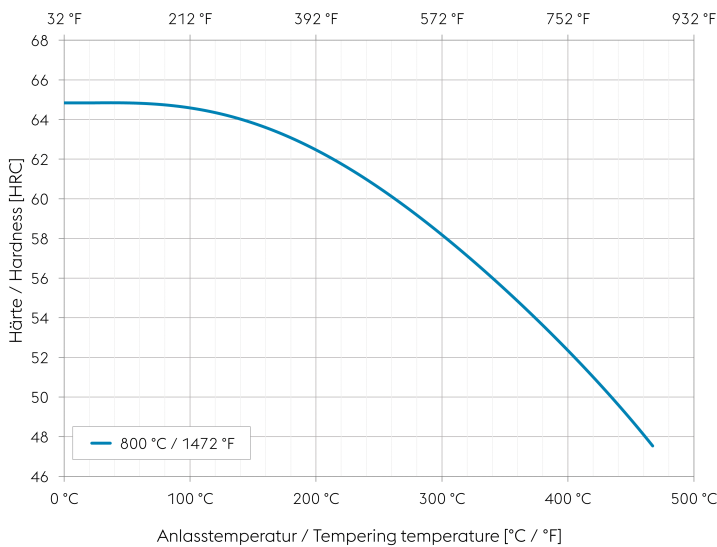
### Leveringsconditie

|                 |          |
|-----------------|----------|
| <b>gegloeid</b> |          |
| Hardheid (HB)   | max. 220 |

### Warmtebehandeling

|                           |                 |   |
|---------------------------|-----------------|---|
| <b>Annealing</b>          |                 |   |
| Temperatuur               | 710 naar 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.   |
| <b>Stress relieving</b>   |                 |   |
| Temperatuur               | 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 1-2 hours.   |
| <b>Harden en ontlaten</b> |                 |   |
| Temperatuur               | 780 naar 820 °C | Oil. Salt bath 392 to 482°F (200 to 250°C), up to 0,787 inch (20 mm) thickness. Holding time after temperature equalization: 15 to 30 minutes. After hardening, tempering to the desired working hardness, see tempering chart. |

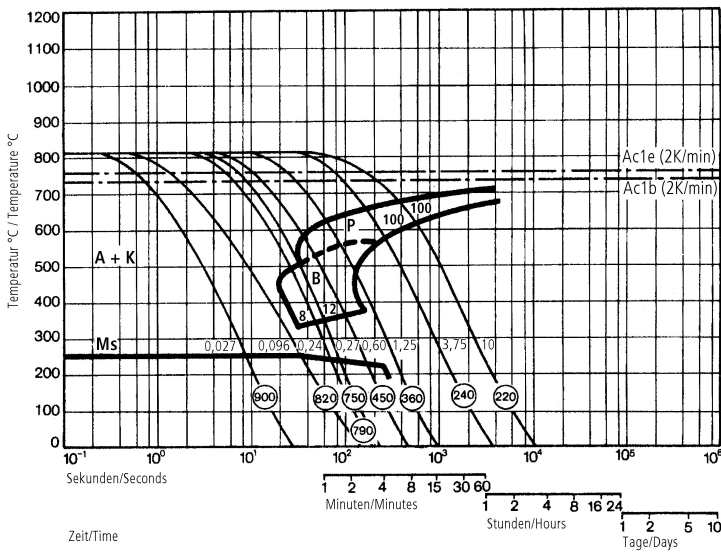
### Tempering chart



**Tempering:**

Hardening temperature:  
800°C  
 Specimen size: square 20 mm

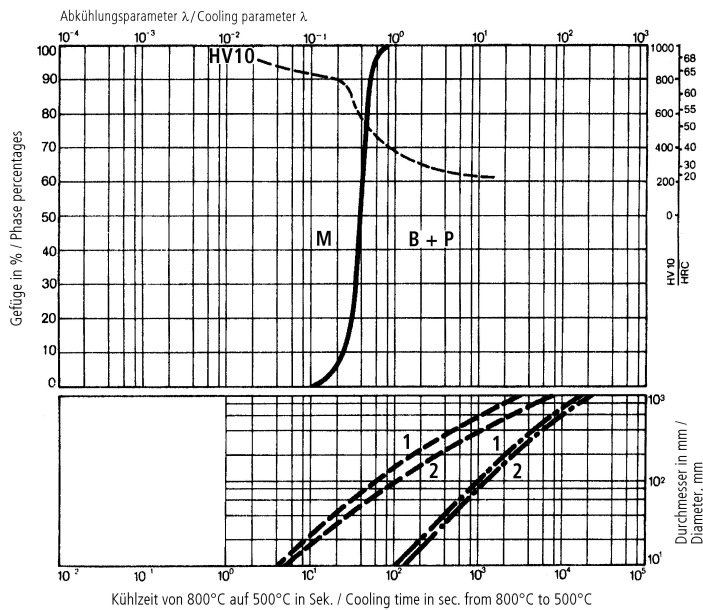
**Continuous cooling CCT curves**



Austenitising temperature: 1490°F (810°C)  
Holding time: 15 minutes

O Vickers hardness  
8...100 phase percentages  
0.027...10 cooling parameter (λ), i.e. duration of cooling from 1472 to 932°F (800 to 500°C) in s x 10<sup>-2</sup>

**Quantitative phase diagram**

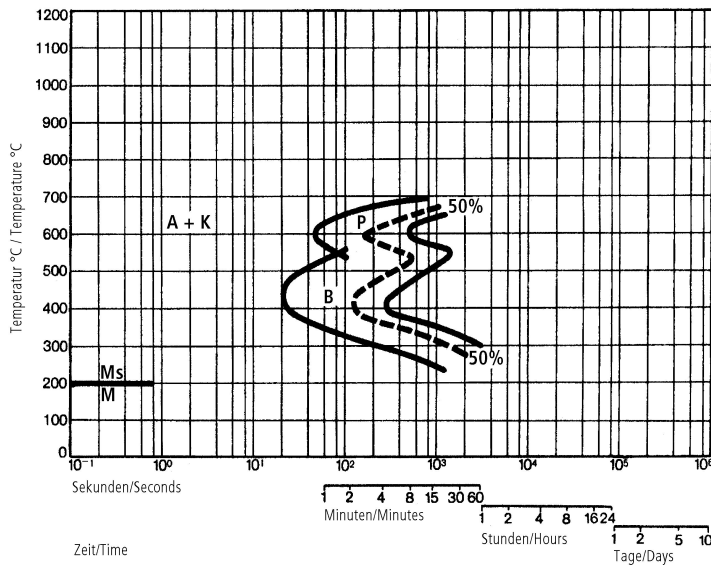


A... Austenite  
B... Bainite  
K... Carbide  
M... Martensite  
P... Pearlite

----- Oil cooling  
- · - Air cooling

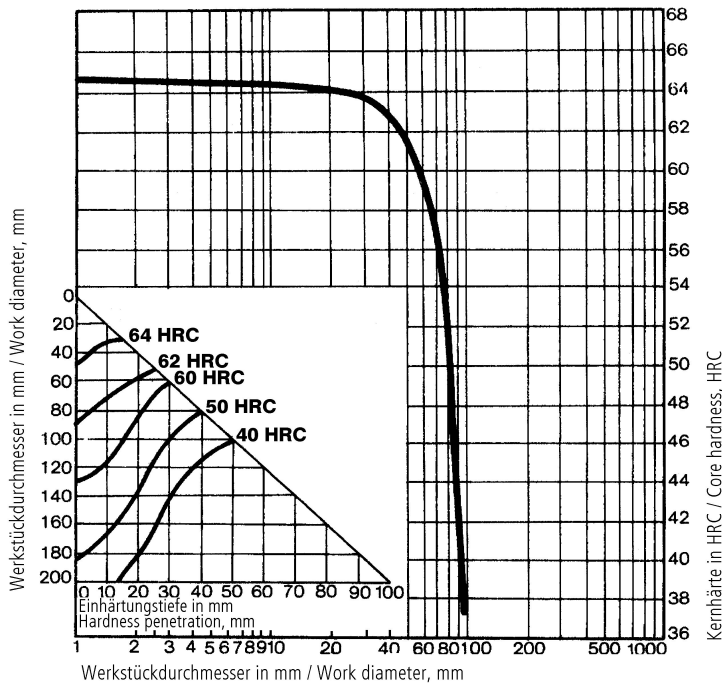
1... Edge or face  
2... Core

**Isothermal TTT curves**



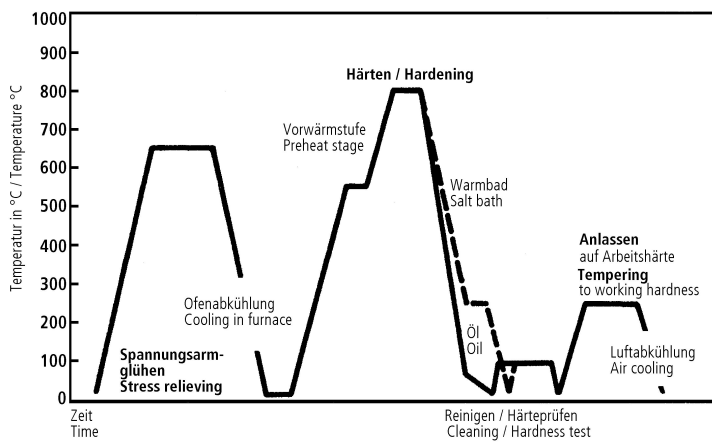
Austenitising temperature: 810°C / 1490°F  
Holding time: 15 minutes

**Influence of work diameter on core hardness and hardness penetration**



Quenched from: 800°C / 1472°F  
Agent: Oil

## Heat treatment sequence



## Fysische eigenschappen

|   |      |
|---|------|
| Temperatuur (°C)  | 20   |
| Soortelijk gewicht (kg/dm <sup>3</sup> )                  | 7,85 |
| Thermische conductiviteit (W/(m.K))                       | 30   |
| Soortelijke warmte (kJ/kg K)                              | 0,46 |
| Specifieke elektrische weerstand (Ohm.mm <sup>2</sup> /m) | 0,35 |
| Elasticiteitsmodus (10 <sup>3</sup> N/mm <sup>2</sup> )   | 210  |

## Thermische expansie

| Temperatuur (°C)                               | 100  | 200 | 300  | 400  | 500  |
|--|------|-----|------|------|------|
| Thermische expansie (10 <sup>-6</sup> m/(m.K)) | 11,5 | 12  | 12,2 | 12,5 | 12,8 |

**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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