

ACIERS POUR TRAVAIL À FROID

Variantes de produits disponibles

Produit long*
Tôle

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

Description du produit

BÖHLER K110 - acier au chrome à 12 % lédeburitique à faibles variations dimensionnelles. Convient particulièrement pour le durcissement à l'air. Bonne ténacité.

Procédé d'élaboration

Airmelted

Propriétés

- > Résistance à l'usure : bien
- > Stabilité dimensionnelle : bien
- > Acier de deuxième trempe pour travail à froid à faible variation dimensionnelle : bien

Applications

- > Cisailages / couteaux pour machines
- > Frappe à froid (ex. monnaie)
- > Eléments standards (carcasses, ejecteurs, bagues...)
- > Equipements pour l'industrie minière
- > Composants pour la mécanique générale
- > Laminage
- > Découpage et emboutissage fins
- > Vis et cylindres
- > Cylindres
- > Thread rolling (FR)
- > Formage à froid
- > Compactage de poudre
- > Composants pour l'industrie du recyclage
- > Pièces d'usure

Données techniques

Désignation normalisée		Normes	
1.2379	SEL	4957	EN ISO
~T30402	UNS		
X153CrMoV12	EN		
D2	AISI		

Composition chimique

C	Si	Mn	Cr	Mo	V
1,55	0,30	0,30	11,30	0,75	0,75

Comparaison des caractéristiques

	Résistance à la compression	Stabilité dimensionnelle lors du traitement thermique	Ténacité	Résistance à l'usure abrasive	Résistance à l'usure adhésive
BÖHLER K110	★★	★★★	★	★★★	★★
BÖHLER K100	★★	★★	★	★★★	★★
BÖHLER K105	★★	★★	★	★★	★★
BÖHLER K107	★★	★★	★	★★★	★★
BÖHLER K190 MICROCLEAN®	★★★★	★★★★★	★★★★	★★★★	★★★★
BÖHLER K294 MICROCLEAN®	★★★★★	★★★★★	★★★	★★★★★	★★★★★
BÖHLER K340 ECOSTAR®	★★★	★★★	★★	★★	★★
BÖHLER K340 ISODUR®	★★★	★★★★	★★★	★★★	★★★★
BÖHLER K346	★★★	★★★	★★★	★★★★	★★
BÖHLER K353	★★	★★★	★★	★★	★★
BÖHLER K360 ISODUR®	★★★	★★★★	★★★	★★★★	★★★★
BÖHLER K390 MICROCLEAN®	★★★★★	★★★★★	★★★★	★★★★★	★★★★★
BÖHLER K490 MICROCLEAN®	★★★★	★★★★	★★★★	★★★★	★★★★
BÖHLER K497 MICROCLEAN®	★★★★★	★★★★★	★★★	★★★★★	★★★★★
BÖHLER K888 MATRIX	★★★★	★★★★★	★★★★★	★★	★★
BÖHLER K890 MICROCLEAN®	★★★★	★★★★★	★★★★★	★★★	★★★

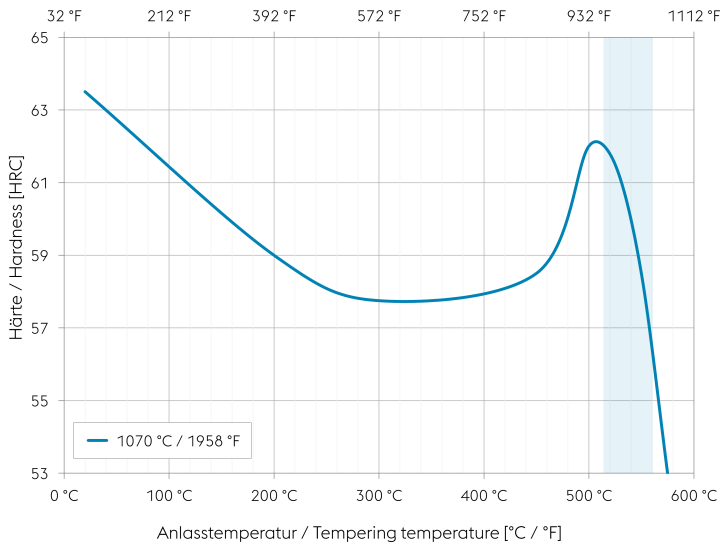
Condition de livraison

Recuit	
Dureté (HB)	max. 250

Traitement thermique

Recuit		
Température	800 jusqu'à 850 °C	Slow controlled cooling in furnace at a rate of 10 to 20°C/hr down to approx. 600°C, further cooling in air.
Recuit de détente		
Température	650 jusqu'à 700 °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.
Trempe et revenu		
Température	1 030 jusqu'à 1 070 °C	Complex shapes / air, simple shapes / air blast, oil, salt bath from (220 to 250°C or 500 to 550°C) or gas. Holding time after temperature equalization: 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. Recommended tempering temperature is indicated by the blue area in the chart.

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

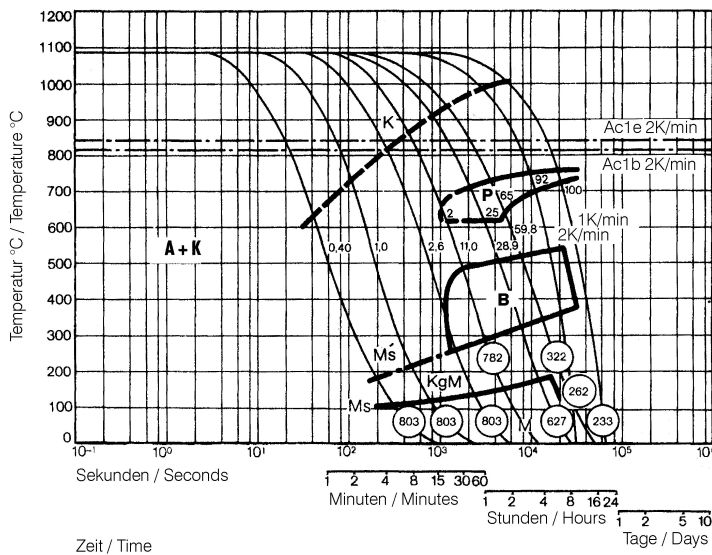
Slow cooling to room temperature after each tempering step is recommended.

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

It is recommended to temper at least three times above the secondary hardness maximum.

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

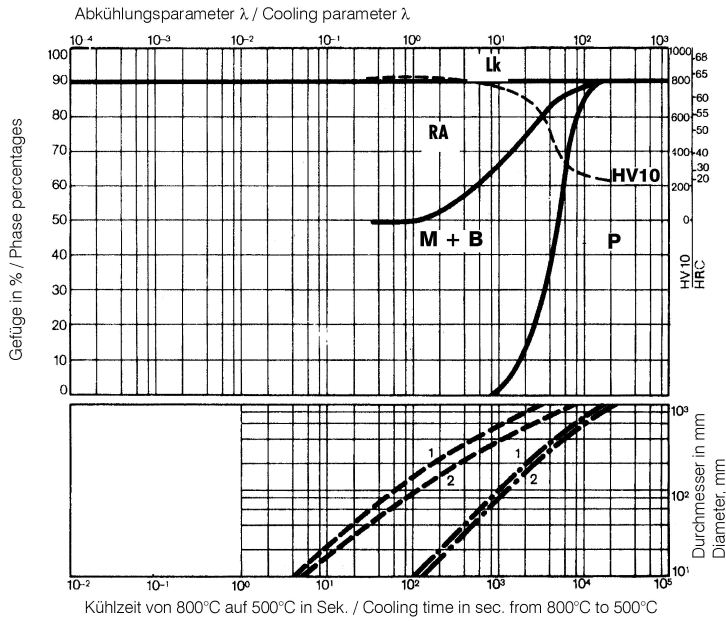
Continuous cooling CCT curves



Austenitising temperature: 1080°C / 1976°F
Holding time: 30 minutes

O Hardness in HV
2...100 phase percentages
0,40...59,8 cooling parameters, i. e. Cooling from 800 - 500°C (1472 - 932°F) in $s \times 10^{-2}$
2...1 K/min cooling rate in K/min in the 800 - 500°C (1472 - 932°F) range
Range of grain boundary martensite formation
KgM... Grain boundary martensite

Quantitative phase diagram

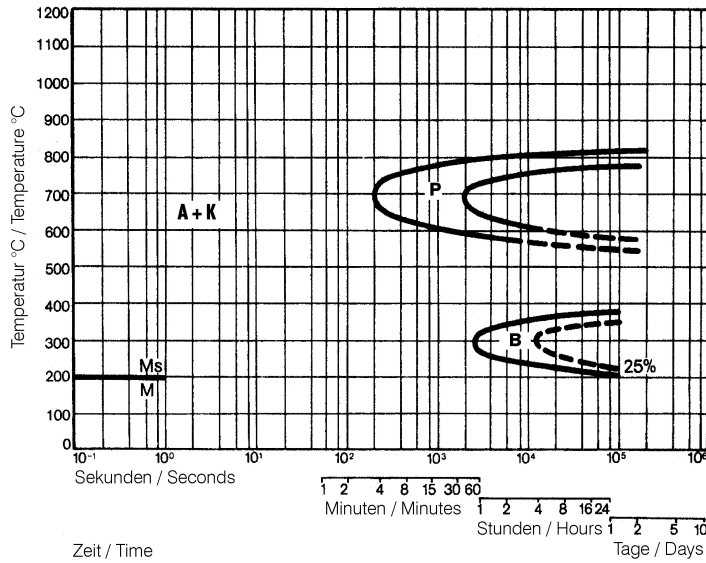


- Lk... Ledeburite carbide
- RA... Residual austenite
- A... Austenite
- B... Bainite
- P... Perlite
- K... Carbide
- M... Martensite

- Oil cooling
- · - Air cooling

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

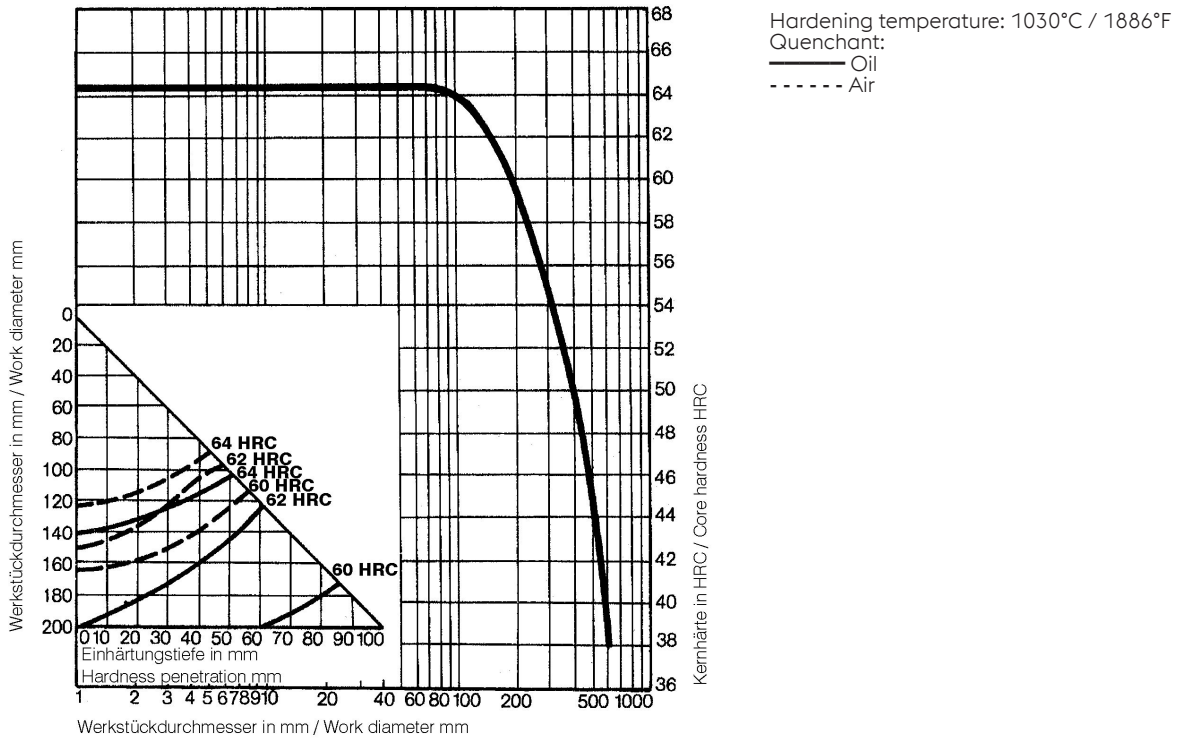
Isothermal TTT curves



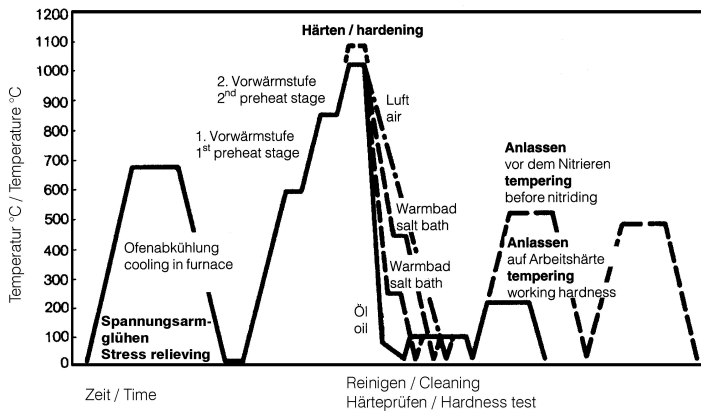
Austenitising temperature: 1020°C / 1868°F
Holding time: 30 minutes

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

Influence of work diameter on core hardness and hardness penetration



Heat treatment sequence



Propriétés physiques

Température (°C)	20
Densité (kg/dm ³)	7,67
Conductivité thermique (W/(m.K))	23,9
Chaleur spécifique (kJ/kg K)	0,47
Résistivité électrique (Ohm.mm ² /m)	0,65
Module d'élasticité (10 ³ N/mm ²)	200

Dilatation thermique

Température (°C)	100	200	300	400	500	600	700
Dilatation thermique (10 ⁻⁶ m/(m.K))	11	11,4	11,9	12,2	12,7	12,8	12,1

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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