НЕТЕПЛОСТОЙКИЕ СТАЛИ

Доступные формы продукта

Длинномерные изделия* | Пластины

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

Описание продукта

BÖHLER K110 – Не изменяющая размеры, ледебуритная 12%-ная хромистая сталь. Особенно хорошо подходит для воздушной закалки. Хорошая вязкость.

Маршрут плавления

Airmelted

Свойства

- Износостойкость : хорошо
- Размерная стабильность : хорошо

Применение

- Машинные измерители (для изготовителей)
- Coining
- Стандартные детали (пресс-формы, пластины, штифты, штампы)
- Комп. для подземного обор. (бурильные машины, валы и т.д.)
- Общие компоненты для машиностроения
- Прокатка
- Точное формообразование заготовок / формообразование заготовок / штамповка
- Винты и втулки
- Вальцы
- Thread rolling (RU)
- Cold Forming
- Прессование порошков
- Компоненты для промышленности рециклирования
- Быстроизнашивающиеся детали

Технические данные

Обозначение материала	
1.2379	SEL
~T30402	UNS
X153CrMoV12	EN
D2	AISI

Стандарты	
4957	EN ISO

Химический состав

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

Свойства материала

	Прочность на сжатие	Стабильность размеров при термообработке	Жесткость	Стойкость к абразивному износу	Износостойкий клей
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	★★★★	★★★★★	★★★★★	★★★	★★★

Условие поставки

Annealed

Твердость (HB)	макс. 250

Термическая обработка

Annealing

Температура	800 на 850 °C	Slow controlled cooling in furnace at a rate of 10 to 20 °C/hr (18 to 36 °F/hr) down to approximately 600 °C (1112 °F) || Further cooling in air.

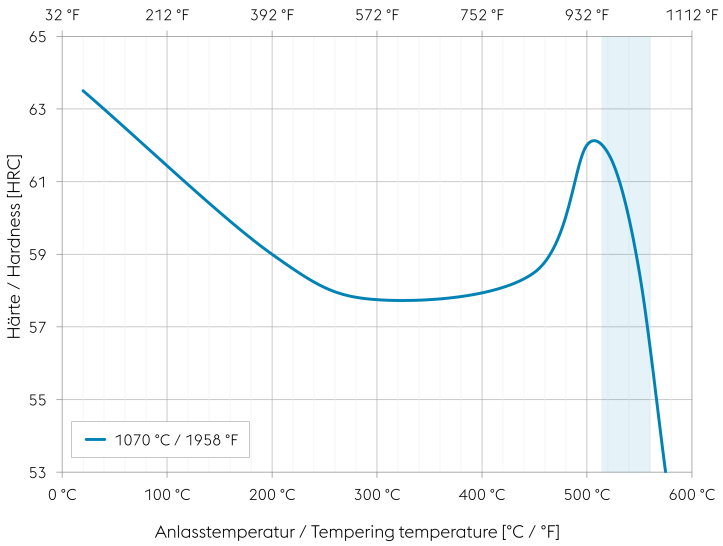
Stress relieving

Температура	650 на 700 °C	After through heating, hold in neutral atmosphere for 1-2 hours. || Slow cooling in furnace || Intended to relieve stresses caused by extensive machining or in complex shapes.

Hardening and Tempering

Температура	1 030 на 1 070 °C	Quenching: Oil, salt bath (220 to 250 °C or 500 to 550 °C | 428 to 482 °F or 932 to 1022 °F), gas, compressed or still air. Tools of intricate shape or with sharp edges should preferably be hardened in air. || Holding time after temperature equalization: 15 to 30 minutes. || After hardening, tempering to the desired working hardness according to the tempering chart.

Tempering chart



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

Slow heating to tempering temperature immediately after hardening.

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

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

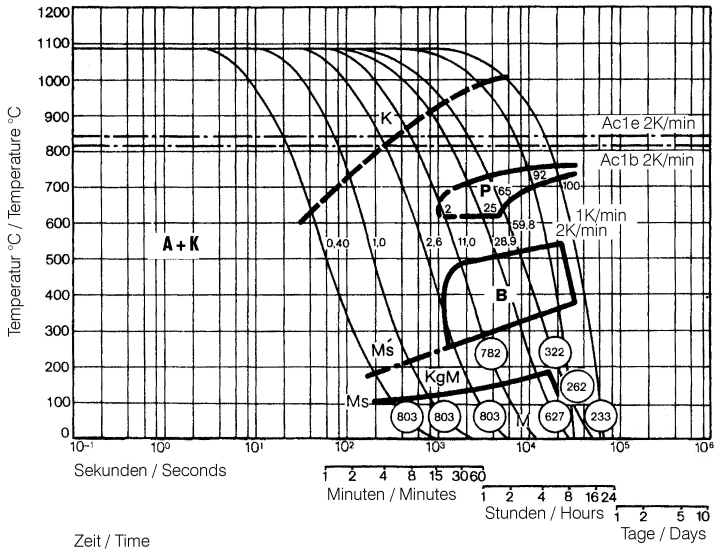
It is recommended to temper at least three times above the secondary hardness maximum.

Cooling in air to room temperature after each tempering step is recommended.

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

Recommended tempering temperature range is indicated by the blue area in the chart.

Continuous cooling CCT curves



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

O Vickers hardness

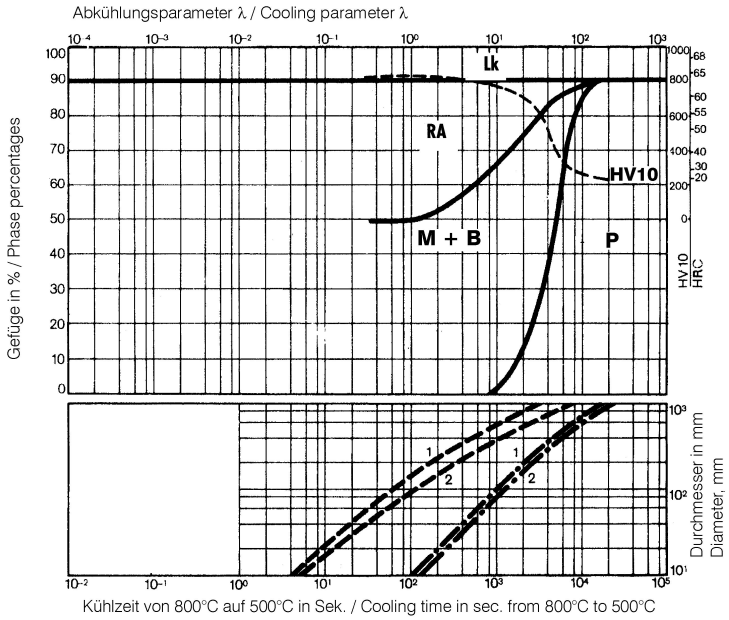
2...100 phase percentages

0.40...59.8 cooling parameter λ, i.e. duration of cooling from 800 to 500 °C (1472 to 932 °F) in s x 10^{-2}

1...2 K/min... cooling rate in the range of 800 to 500 °C (1472 to 932 °F)

A... Austenite
K... Carbide
P... Perlite
B...Bainite
M... Martensite
Ms... Martensite starting temperature

Quantitative phase diagram

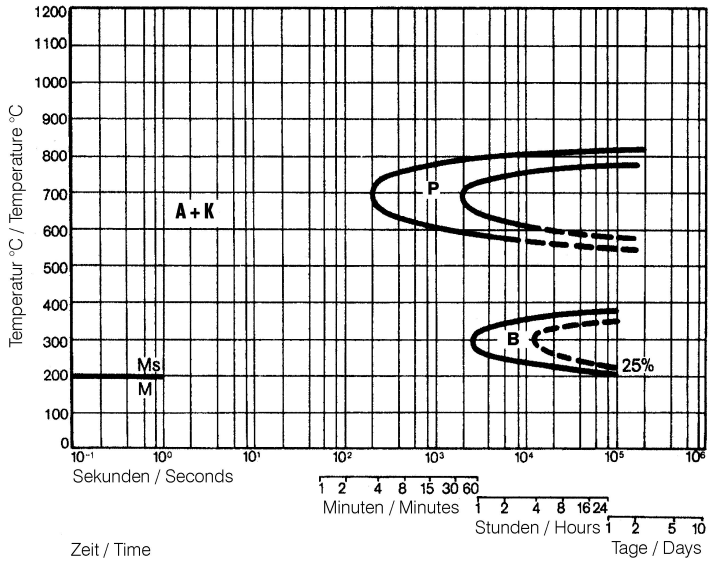


HV10... Vickers Hardness
Lk... Ledeburite carbide
RA... Residual austenite
M... Martensite
B... Bainite
P... Perlite

- - - Oil cooling
- • - Air cooling

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

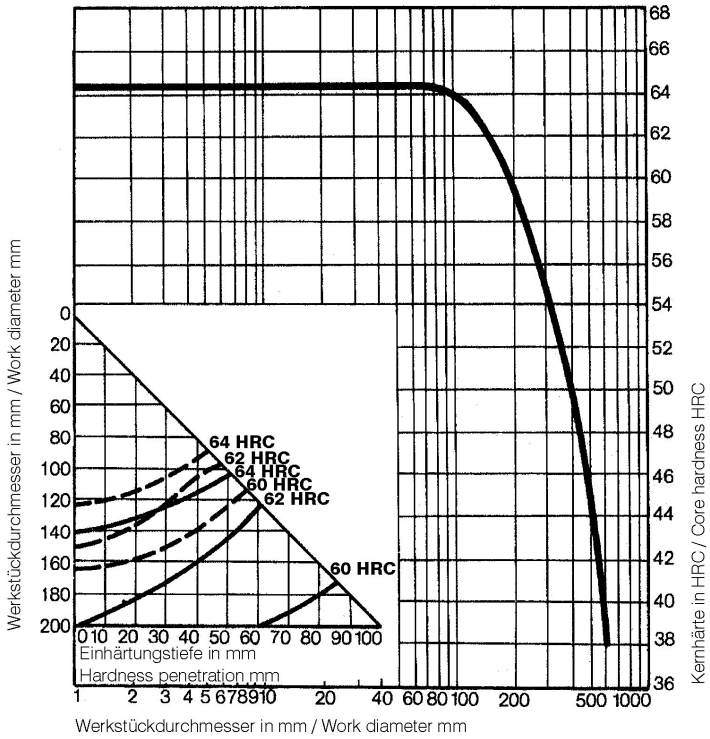
Isothermal TTT curves



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

A... Austenite
K... Carbide
P... Perlite
B... Bainite
M... Martensite
Ms... Martensite starting temperature

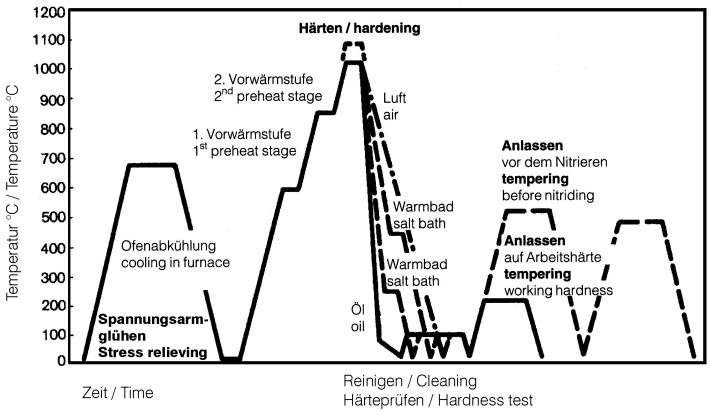
Influence of work diameter on core hardness and hardness penetration



Quenched from: 1030 °C / 1886 °F

Quenchant:
——— Oil
- - - - - - Air

Heat treatment sequence



Физические свойства

Температура (°C)	20
Плотность (kg/dm^3)	7,67
Теплопроводность (W/(m.K))	23,9
Удельная теплоемкость (kJ/kg K)	0,47
Удельное электрическое сопротивление (Ohm.mm^2/m)	0,65
Модуль упругости (10^{3}N/mm^2)	200

Тепловое расширение

Температура (°C)	100	200	300	400	500	600	700
Тепловое расширение (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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ONE STEP AHEAD.