OȚELURI PENTRU LUCRU LA RECE

Application Segments

Muncă la rece

Available Product Variants

Long Products* | Plates

* Datele prezentate se referă exclusiv la produsele lungi. Vă rugăm să respectați explicațiile detaliate de la sfârșitul fișei tehnice (pdf).

Product Description

BÖHLER K360 ISODUR belongs to the group of 8% chromium steels. This tool steel is produced using the electro-slag remelting (ESR) process developed by BÖHLER. This re-melting technology ensures the lowest micro and macro segregation as well as excellent purity and uniformity of the material. The alloy composition with higher molybdenum and vanadium content makes BÖHLER K360 ISODUR even more wear resistant than BÖHLER K340 ISODUR. Compared to tool steels like 1.2379 (D2), this combination of better toughness and wear resistance offers significant advantages for punching and cutting tools.

Process Melting

Topit în aer + refulat

Properties

- Rezistență și ductilitate : good
- Rezistență la uzură : high
- Rezistența la compresiune : good
- Stabilitatea dimensională : good
- Măcinabilitate : very high

Applications

- Cuțit de mașină (pentru producători)
- Montarea monedei
- Șuruburi și butoaie
- Rulouri
- Matrițe de perforare a pastilelor
- Industria ambalajelor
- Laminare
- Blanking fin, ștanțare, blanking
- Piese de uzură
- Componente pentru construcții subterane (foraje, puțuri etc.)
- Inginerie mecanică
- Formare la rece
- Pulbere de presare
- Rularea firelor
- Componente pentru industria reciclării
- Roll Forming

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	V	Al	Nb
1.25	0.90	0.35	8.75	2.70	1.18	+	+

Material characteristics

	Compressive strength	Dimensional stability during heat treatment	Toughness	Wear resistance abrasive	Wear resistance adhesive
BÖHLER K360 ISODUR	★★★	★★★★	★★★	★★★★	★★★★
BÖHLER K100	★★	★★	★	★★★	★★
BÖHLER K105	★★	★★	★	★★	★★
BÖHLER K107	★★	★★	★	★★★	★★
BÖHLER K110	★★	★★★	★	★★★	★★
BÖHLER K190 MICROCLEAN	★★★★	★★★★★	★★★★	★★★★	★★★★
BÖHLER K294 MICROCLEAN	★★★★★	★★★★★	★★★	★★★★★	★★★★★
BÖHLER K340 ECOSTAR	★★★	★★★	★★	★★	★★
BÖHLER K340 ISODUR	★★★	★★★★	★★★	★★★	★★★★
BÖHLER K346	★★★	★★★	★★★	★★★★	★★
BÖHLER K353	★★	★★★	★★	★★	★★
BÖHLER K390 MICROCLEAN	★★★★★	★★★★★	★★★★	★★★★★	★★★★★
BÖHLER K490 MICROCLEAN	★★★★	★★★★★	★★★★	★★★★	★★★★
BÖHLER K497 MICROCLEAN	★★★★★	★★★★★	★★★	★★★★★	★★★★★
BÖHLER K888 MATRIX	★★★★	★★★★★	★★★★★	★★	★★
BÖHLER K890 MICROCLEAN	★★★★	★★★★★	★★★★★	★★★	★★★

Delivery condition

Recoaptă

Hardness (HB)	max. 250

Heat treatment

Recoacere

Temperature	800 to 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.

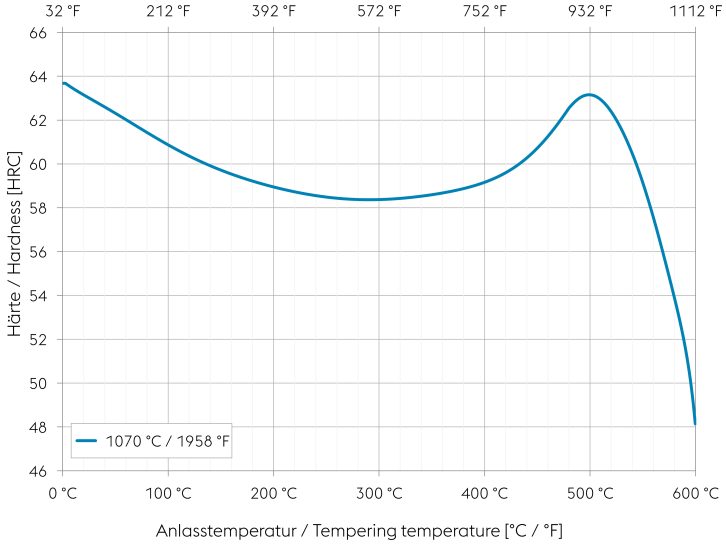
Eliminarea stresului

Temperature	560 to 650 °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.

Călire și revenire

Temperature	1,040 to 1,080 °C	Quenching: Oil, salt bath, gas, compressed or still 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 - Tempering curve in the vacuum furnace



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.

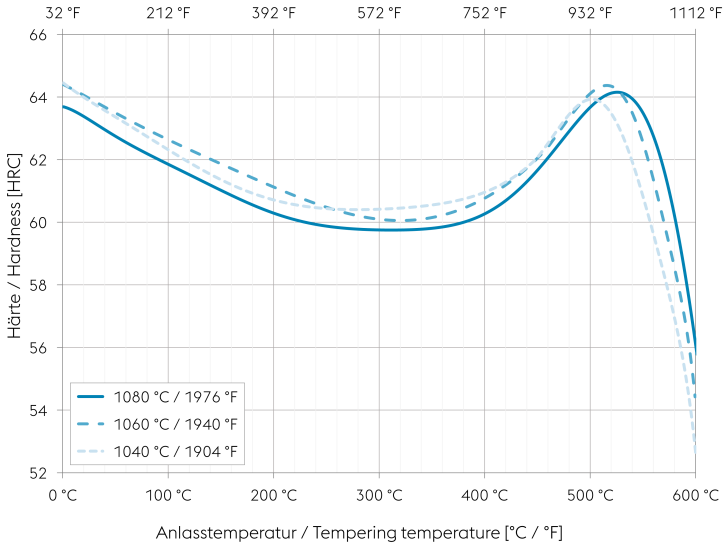
Please refer to the tempering chart for guide values for the achievable hardness after tempering.

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.

Tempering chart - Comparison of different austenitising temperatures (salt-bath / oil)



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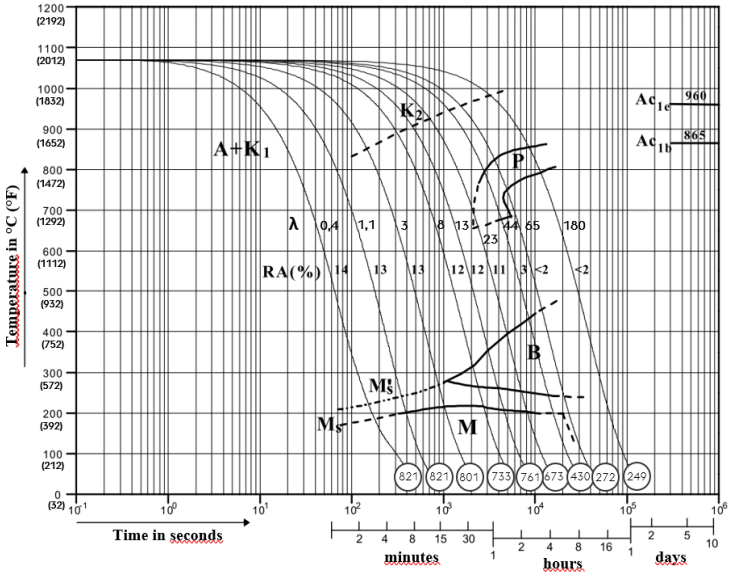
Continuous cooling CCT curves



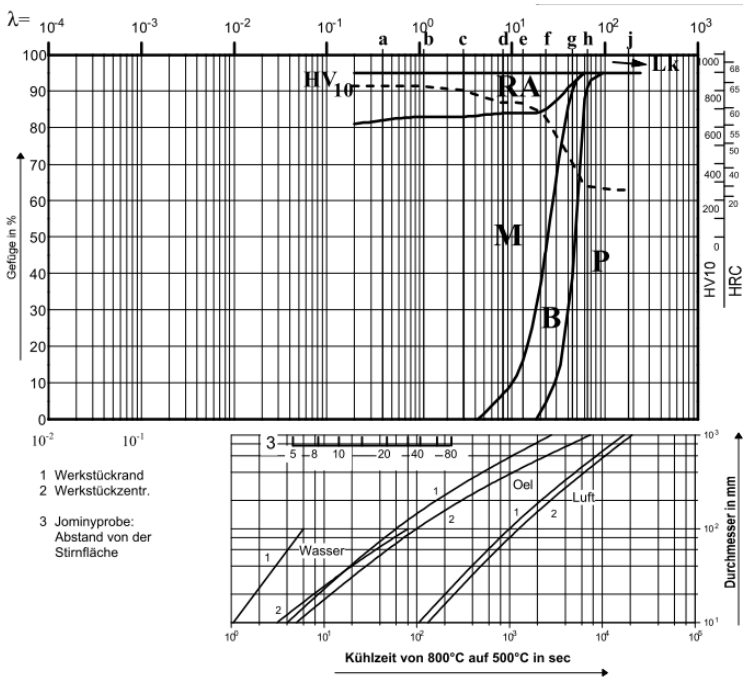
Austenitising temperature: 1070 °C (1958 °F)
Holding time: 30 minutes

◯ Vickers hardness

0.4...59.8 cooling parameter λ, i.e. duration of cooling from 800 to 500 °C (1472 to 932 °F) in s x 10^{-2}

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

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

Physical Properties

Temperature (°C)	20
Density (kg/dm³)	7.7
Thermal conductivity (W/(m.K))	16.3
Specific heat (kJ/kg K)	0.46
Spec. electrical resistance (Ohm.mm²/m)	0.64
Modulus of elasticity (10³N/mm²)	212

Thermal Expansions between 20°C | 68°F and ...

Temperature (°C)	100	200	300	400	500
Thermal expansion (10⁻⁶ m/(m.K))	11.2	11.5	11.8	12.3	12.7

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ONE STEP AHEAD.