BÖHLER

BÖHLER K190
MICROCLEAN®

ACIERS POUR TRAVAIL À FROID

Variantes de produits disponibles

Produit long | Pièce forgée

Description du produit

Seuls des matériaux PM ayant une haute résistance à l'usure permettent aujourd'hui d'obtenir l'amélioration des performances dans la construction d'outils exigeants. Les propriétés du matériau, sa ténacité, sa résistance à l'usure, sa résistance à la compression et sa tenue à la coupe sont ici déterminantes - des avantages que le BÖHLER K190 MICROCLEAN combine d'une manière impressionnante.

Propriétés

- Toughness & Ductility: high
- Good toughness means safety against cracking of the molds in use: good
- Uniformly high strength and toughness, even with large dimensions: good
- Wear Resistance: high
- Compressive strength: high
- Dimensional stability: very high
- Excellent homogeneity and isotropy: very high
- Fine carbide structure: good
- Homogeneous microstructure: good

Applications

- Laminage
- Vis et cylindres
- Pièces d'usure
- Cold Forming
- Composants pour l'industrie du recyclage
- Composants pour la mécanique générale
- Découpage et emboutissage fins
- Cylindres

Données techniques

Désignation normalisée	
~1.2380	SEL
~ X230CrVMo13 4	EN

Composition chimique

C	Si	Mn	Cr	Mo	V
2,3	0,6	0,3	12,5	1,1	4

voestalpine BÖHLER Edelstahl GmbH & Co KG
www.voestalpine.com/bohler-edelstahl

voestalpine
ONE STEP AHEAD.

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 K190 MICROCLEAN	★★★★	★★★★★	★★★★	★★★★	★★★★
BÖHLER K100	★★	★★	★	★★★	★★
BÖHLER K105	★★	★★	★	★★	★★
BÖHLER K107	★★	★★	★	★★★	★★
BÖHLER K110	★★	★★★	★	★★★	★★
BÖHLER K294 MICROCLEAN	★★★★★	★★★★★	★★★	★★★★★	★★★★★
BÖHLER K340 ISODUR	★★★	★★★★	★★★	★★★	★★★★
BÖHLER K340 ECOSTAR	★★★	★★★	★★	★★	★★
BÖHLER K360 ISODUR	★★★	★★★★	★★★	★★★★	★★★★
BÖHLER K346	★★★	★★★	★★★	★★★★	★★
BÖHLER K353	★★	★★★	★★	★★	★★
BÖHLER K390 MICROCLEAN	★★★★★	★★★★★	★★★★	★★★★★	★★★★★
BÖHLER K890 MICROCLEAN	★★★★	★★★★★	★★★★★	★★★	★★★
BÖHLER K490 MICROCLEAN	★★★★	★★★★★	★★★★	★★★★	★★★★
BÖHLER K497 MICROCLEAN	★★★★★	★★★★★	★★★	★★★★★	★★★★★

Condition de livraison

Recuit	
Dureté	max. 260 HB

Traitement thermique

Recuit de mise

Température (°C)	800 to 850	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.

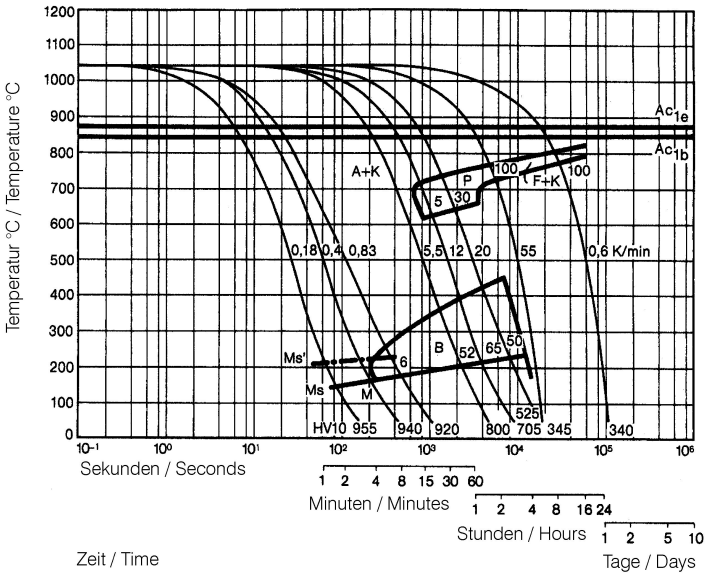
Stress relieving

Température (°C)	650 to 700	After through-heating, soak for 1 to 2 hours in neutral atmosphere. Slow cooling in furnace

Trempe et revenu

Température (°C)	to	From a neutral atmosphere at 1050 – 1150°C / quench in oil, salt-bath at 200 – 250 °C or at 500 – 550 °C, in air or in gas. A sufficiently high cooling rate must be ensured. Holding time after through-heating: 20 to 30 minutes, soaking time depends on the size of the work-piece and furnace parameters. Vacuum hardening is recommended. Average hardness after quenching prior to tempering see austenitising chart. We recommend hardening from the lower end of the hardening temperature range where high toughness is required and/or where the tool is of complicated geometry. Where high wear resistance is of the utmost importance we recommend hardening from the top end of the hardening temperature range given. After hardening, tempering to the desired working hardness, see tempering chart.

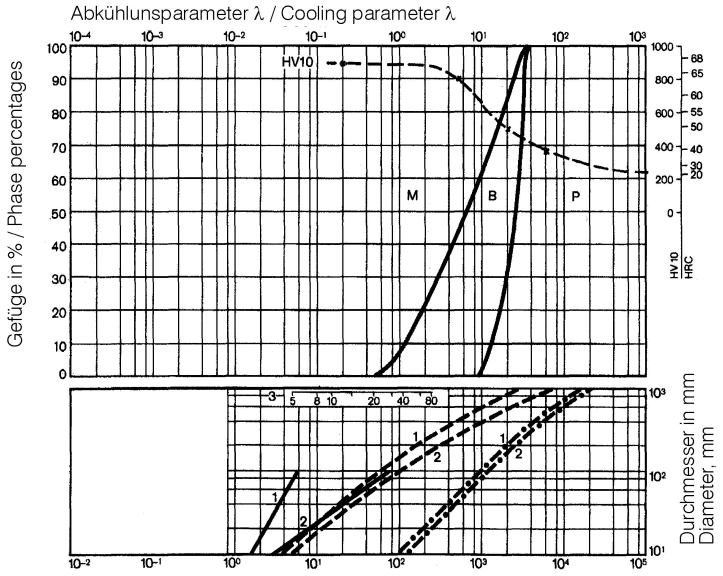
Continuous cooling CCT curves



Austenitizing temperature: 1050°C / 1922°F
Holding time: 10 minutes

5...100 phase percentages
0,18...50 cooling parameter, i.e. duration of cooling from 800 – 500° C (1472°F - 932°F) in s x 10^{-2}
0.6 K/min. cooling rate in the 800 – 500 °C (1472°F - 932°F) range

Quantitative phase diagram



Kühlzeit von 800°C auf 500°C in Sek. / Cooling time in sec. from 800°C to 500°C

Ms'... range of grain boundary martensite
LK... Ledeburitic carbides
A... Austenite
M... Martensite
P... Perlite
B... Bainite

——— Water
– – – – Oil
- - - - - - Air

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

Physical Properties

Température (°C)	**20**
Densité (kg/dm^3)	7,6
Conductivité thermique (W/(m.K))	21,5
Chaleur spécifique (J/(kg.K))	-
Résistivité électrique (Ohm.mm^2/m)	0,59
Module d'élasticité (10^{3}N/mm^2)	-

Dilatation thermique

Température (°C)	**100**	**200**	**300**	**400**	**500**	**600**	**700**
Dilatation thermique (10^{-6} m/(m.K))	12,2	12,5	13	13,2	13,7	14	13,7

Pour plus d'informations, voir www.voestalpine.com/bohler-edelstahl

The data contained in this brochure is merely for general information and therefore shall not be binding on the company. We may be bound only through a contract explicitly stipulating such data as binding. Measurement data are laboratory values and can deviate from practical analyses. The manufacture of our products does not involve the use of substances detrimental to health or to the ozone layer.

voestalpine BÖHLER Edelstahl GmbH & Co KG
Mariazeller Straße 25
8605 Kapfenberg, AT
T. +43/50304/20-0
E. info@bohler-edelstahl.at
www.voestalpine.com/bohler-edelstahl

voestalpine
ONE STEP AHEAD.