

ACIERS À OUTILS POUR TRAVAIL À CHAUD

Variantes de produits disponibles

Produit long*

Tôle

Pièce forgée

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

Description du produit

BÖHLER W350 ISOBLOC - Acier pour travail à chaud, conçu pour une utilisation dans les moules de coulage sous pression afin de garantir une ténacité élevée dans les outils de grande taille.

Procédé d'élaboration

Airmelted + Remelted

Propriétés

- > Ténacité et ductilité : très élevé
- > Résistance à l'usure : élevé
- > Usinabilité : très élevé
- > Dureté à chaud (dureté rouge) : élevé
- > Polissabilité : très élevé
- > Conductivité thermique : très élevé
- > Micro-propreté : élevé

Applications

- > Extrusion
- > Fonderie en moulage gravité / Fonderie basse pression
- > Matricage à chaud
- > Forge
- > Fonderie sous pression - HPDC
- > Presse à forger horizontale (Hatebur)
- > Composants pour la mécanique générale
- > Moulage par injection
- > Mécanique générale / machines-outils











Données techniques

Désignation normalisée		Normes	
BÖHLER patent	Market grade	#207	NADCA
E1850	NADCA		

Composition chimique

C	Si	Mn	Cr	Mo	V	N
0,38	0,20	0,55	5,00	1,80	0,55	def.

Comparaison des caractéristiques

	Résistance à haute température	Ténacité à haute température	Résistance à l'usure à haute température
	★★★	★★★★★	★★★
	★★	★★★★	★★
	★★	★★★	★★
	★★★	★★★★	★★★
	★★★	★★★	★★★
	★★★★	★★★	★★★★
	★★★	★★	★★★
	★★★★★	★★★★	★★★★★
	★★	★★★★★	★★
	★★★★	★★★★	★★★★

Condition de livraison

Recuit

Dureté (HB)	max. 205
-------------	----------

Traitement thermique

Recuit

Température	800 jusqu'à 850 °C	Slow controlled cooling in furnace at a rate of 10 to 20 °C/hr (50 to 68 °F/hr) down to approx. 600 °C (112 °F), further cooling in air.
-------------	--------------------	--

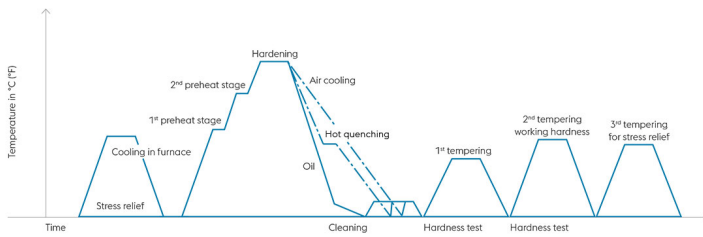
Recuit de détente

Température	600 jusqu'à 670 °C	Slow cooling furnace. To relieve stresses caused by extensive machining, or for complex shapes. Soak for 1 -2 hours after temperature equalisation (in neutral atmosphere).
-------------	--------------------	---

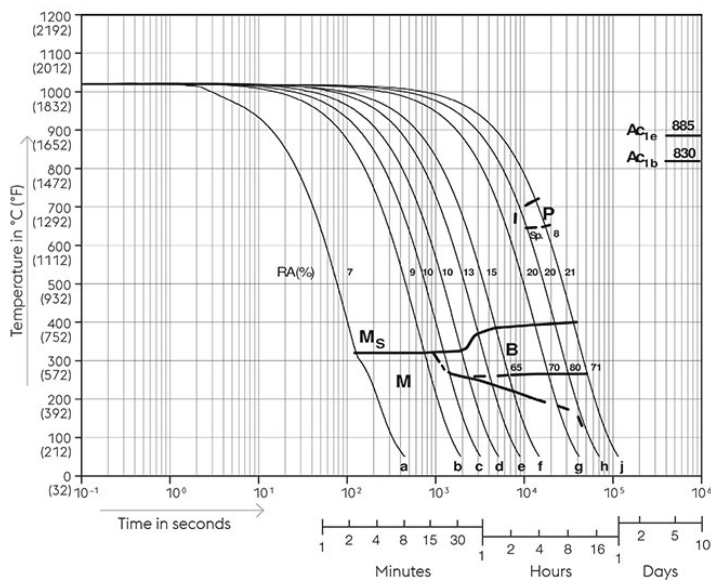
Trempe et revenu

Température	1 010 jusqu'à 1 020 °C	Holding time after temperature equalization: 15 to 30 minutes; In order to prevent coarsening of the grain, hardening must be carried out at the recommended temperature. For big dimensions it's recommended to reduce the temperature to 1010 °C (1850 °F); Quenching: oil, salt bath (500 - 550°C [932 - 1022 °F]), air, inert gas in vacuum; After hardening, required tempering treatment to achieve desired working hardness (see tempering chart).
-------------	------------------------	---

Heat treatment sequence



Continuous cooling CCT curves

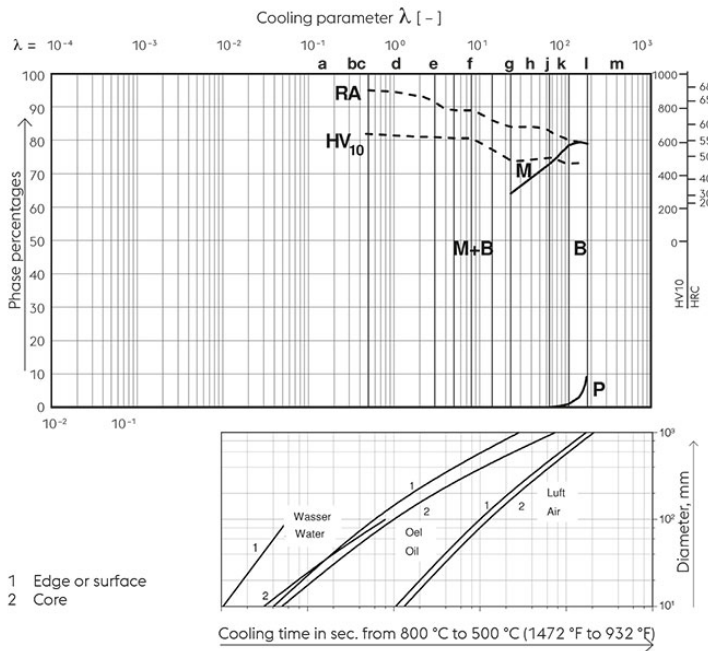


Austenitising temperature: 1020°C (1868°F)
Holding time: 15 minutes
5...100 phase percentages
0.5...180 cooling parameter, i.e. duration of cooling
from 800 - 500°C (1472-932°F) in s x 10⁻²

Table:
Sample λ HV10

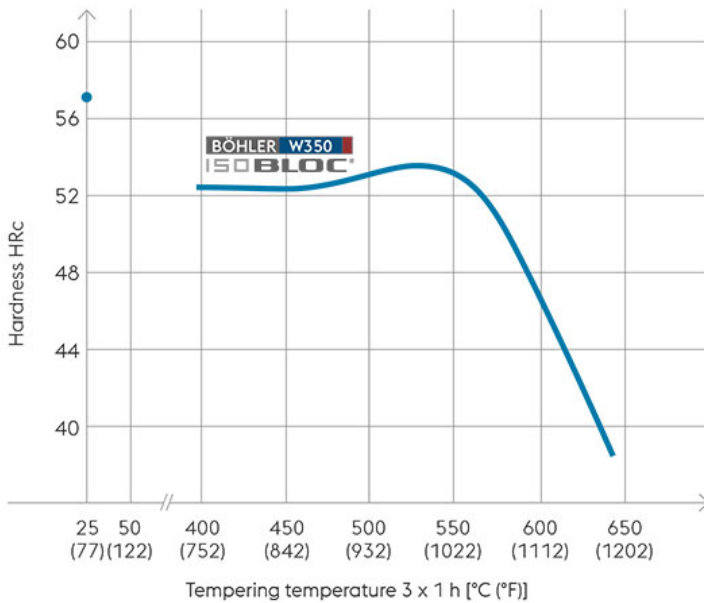
a	0,50	630
b	3	616
c	5	606
d	8	606
e	14	517
f	23	478
g	65	497
h	110	454
j	180	459

Quantitative phase diagram



A... Austenite
B... Bainite
K... Carbide
M... Martensite
P... Pearlite
RA... Retained austenite

Tempering chart



Tempering:

Slow heating to tempering temperature immediately after hardening (time in furnace 1 hour for each 0,787 inch (20 mm) of workpiece thickness but at least 2 hours / cooling in air).

It is recommended to temper at least twice.

A third tempering cycle for the purpose of stress relieving may be advantageous.

1st tempering approx. 86°F (30°C) above maximum secondary hardness.

2nd tempering to desired working hardness. The tempering chart shows average tempered hardness values.

3rd for stress relieving at a temperature 86 to 122°F (30 to 50°C) below highest tempering temperature.

Hardening temperature: 1020°C (1868°F)
Specimen size: square 20 mm

Propriétés physiques

Température (°C)	20
Densité (kg/dm ³)	7,8
Conductivité thermique (W/(m.K))	28,8
Chaleur spécifique (kJ/kg K)	0,46
Résistivité électrique (Ohm.mm ² /m)	-
Module d'élasticité (10 ³ N/mm ²)	214

Dilatation thermique

Température (°C)	100	200	300	400	500	600	700
Dilatation thermique (10 ⁻⁶ m/(m.K))	11,14	11,94	12,42	12,85	13,21	13,51	13,58

Long Products: For additional specifications and technical requirements, please contact our regional voestalpine BÖHLER sales companies.

Open Die Forgings: Product Variant may differ in terms of melting process, technical data, delivery, and surface condition as well as available product dimensions. Please contact the business unit Open Die Forgings of voestalpine BÖHLER Edelstahl GmbH & Co KG.

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.

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.