

ACEROS PARA HERRAMIENTAS DE TRABAJO EN CALIENTE

Formatos disponibles

Productos largos*

Chapas

Forja de matriz abierta

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

Descripción

BÖHLER W350 ISOBLOC - Acero para trabajo en caliente específicamente desarrollado para uso en moldes de fundición a presión, con garantía de alta tenacidad en grandes moldes.

Acero refundido a presión, de excelente aptitud para el temple en profundidad hasta el núcleo de la pieza. Su equilibrada aleación asegura los más elevados valores de tenacidad en herramientas de grandes dimensiones garantizando una mayor resistencia a la deformación y a la fatiga por choque térmico comparado con otros aceros al 5% de cromo. Para insertos en moldes de fundición a presión de grandes espesores y dimensiones.

Método de obtención

Airmelted + Remelted

Propiedades

- > Dureza y Ductilidad : muy alta
- > Resistencia al desgaste : alto
- > Maquinabilidad : muy alta
- > Dureza en caliente (dureza roja) : alto
- > Pulibilidad : muy alta
- > Conductividad térmica : muy alta
- > Micro-limpieza : alto

Aplicaciones

- > Extrusión
- > Fundición por gravedad / a baja presión
- > Forja fría/ conformación en caliente
- > Forja (caliente / semicaliente)
- > Fundición inyectada
- > Forja progresiva (Hatebur)
- > Componentes generales de ingeniería mecánica
- > Moldeo por inyección
- > Ingeniería mecánica / construcción de maquinaria en general

Datos técnicos

Designación		Estándares	
BÖHLER patent	Market grade	#207	NADCA
E1850	NADCA		

Composición Química

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

Características

	Resistencia a altas temperaturas	Tenacidad a altas temperaturas	Resistencia al desgaste a altas temperaturas
	★★★	★★★★★	★★★
	★★	★★★★	★★
	★★	★★★	★★
	★★★	★★★★	★★★
	★★★	★★★	★★★
	★★★★	★★★	★★★★
	★★★	★★	★★★
	★★★★★	★★★★	★★★★★
	★★	★★★★★	★★
	★★★★	★★★★	★★★★

Estado de suministro

recocido

Dureza (HB)	máx. 205
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Tratamiento térmico

Recocido

Temperatura	800 a 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.
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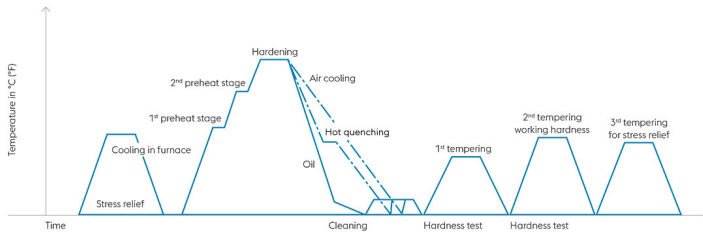
Alivio de tensiones

Temperatura	600 a 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).
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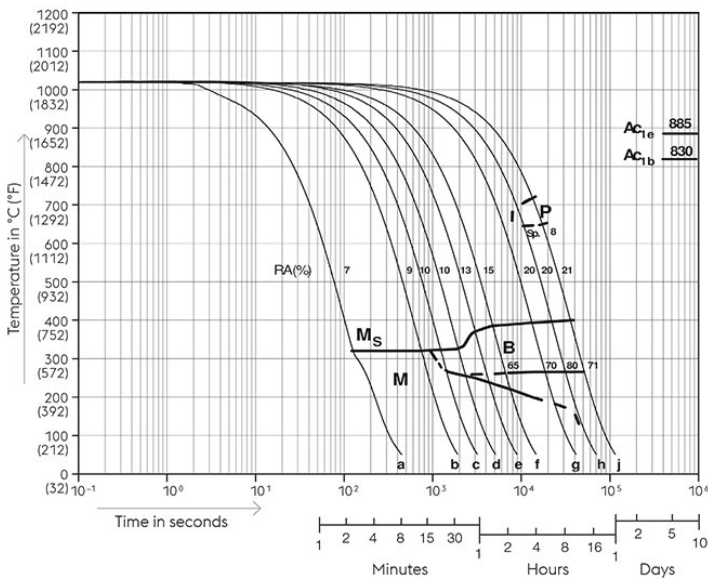
Temple y revenido

Temperatura	1.010 a 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).
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Heat treatment sequence



Continuous cooling CCT curves

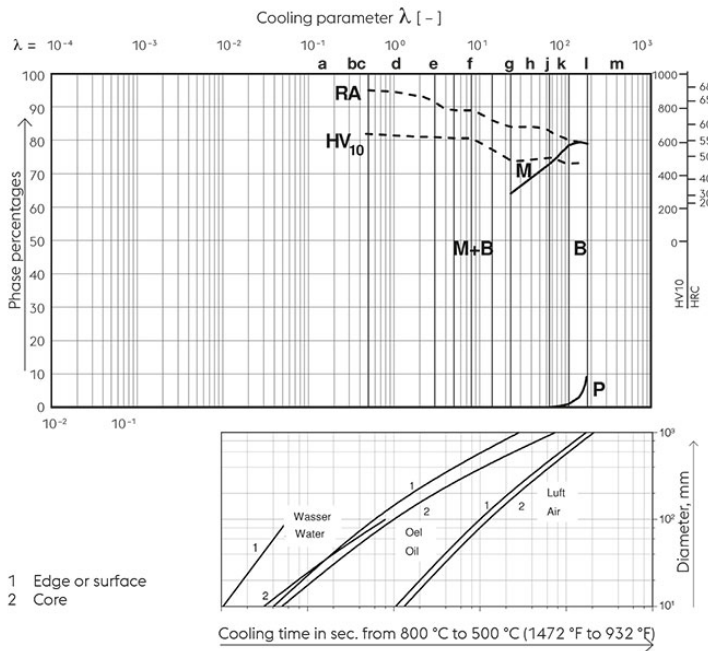


Austenitising temperature: 1020°C (1868°F)
 Holding time: 15 minutes
 5...100 phase percentages
 0.5...180 cooling parameter, i.e. duration of cooling from 800 - 500°C (1472-932°F) in s x 10⁻²

Table:
 Sample λ HV10

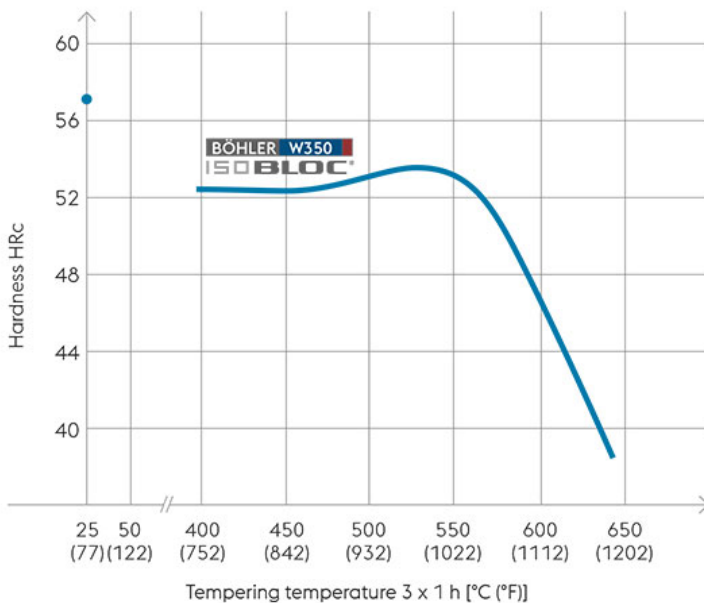
a	0,50	630
b	3	616
c	5	606
d	8	606
e	14	517
f	23	478
g	65	497
h	110	454
j	180	459

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

Propiedades físicas

Temperatura (°C)	20
Densidad (kg/dm ³)	7,8
Conductividad térmica (W/(m.K))	28,8
Calor específico (kJ/kg K)	0,46
Resistencia eléctrica específica (Ohm.mm ² /m)	-
Módulo de elasticidad (10 ³ N/mm ²)	214

Expansión térmica

Temperatura (°C)	100	200	300	400	500	600	700
Expansión térmica (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.

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