



SIHARD 1545 Steel

Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SIHARD 1545	OC100	1.1545	C 105W1 †	C105U	W1

Chemical Composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
1.05	0.20	0.25	-	-	-	-	-	-

Description

This alloy is one of the common water hardening tool steel grades available. W1 is basically a simple high carbon steel and is easily hardened by heating and quenching in water, just as with plain carbon steel alloys. The W series of tool steels are a very simple alloy group, low cost, and responsive to simple heating and water quenching for hardening. The alloy does undergo considerable distortion during quenching.

Applications

W1 is commonly used for hand operated metal cutting tools, cold heading, embossing taps and reamers as well as cutlery.

Physical properties (average values) at ambient temperature

Modulus of elasticity [$10^3 \times \text{N/mm}^2$]: 210

Density [g/cm^3]: 7.85

Thermal conductivity [W/m.K]: 45.0

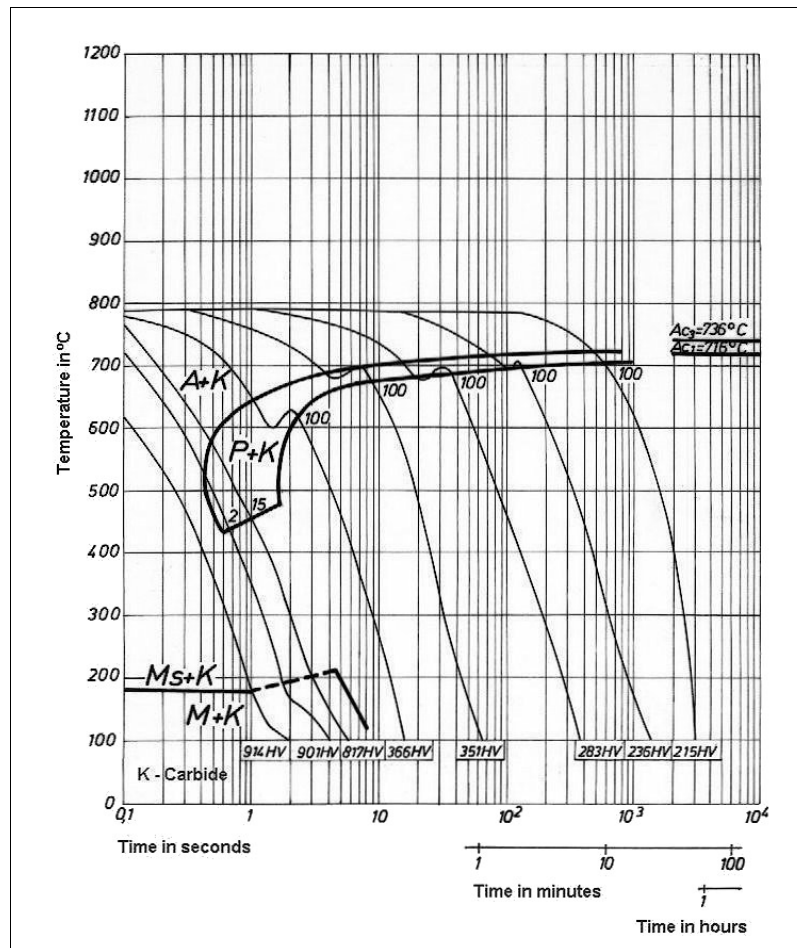
Electric resistivity [$\text{Ohm mm}^2/\text{m}$]: 0.20

Specific heat capacity [J/g.K]: 0.46

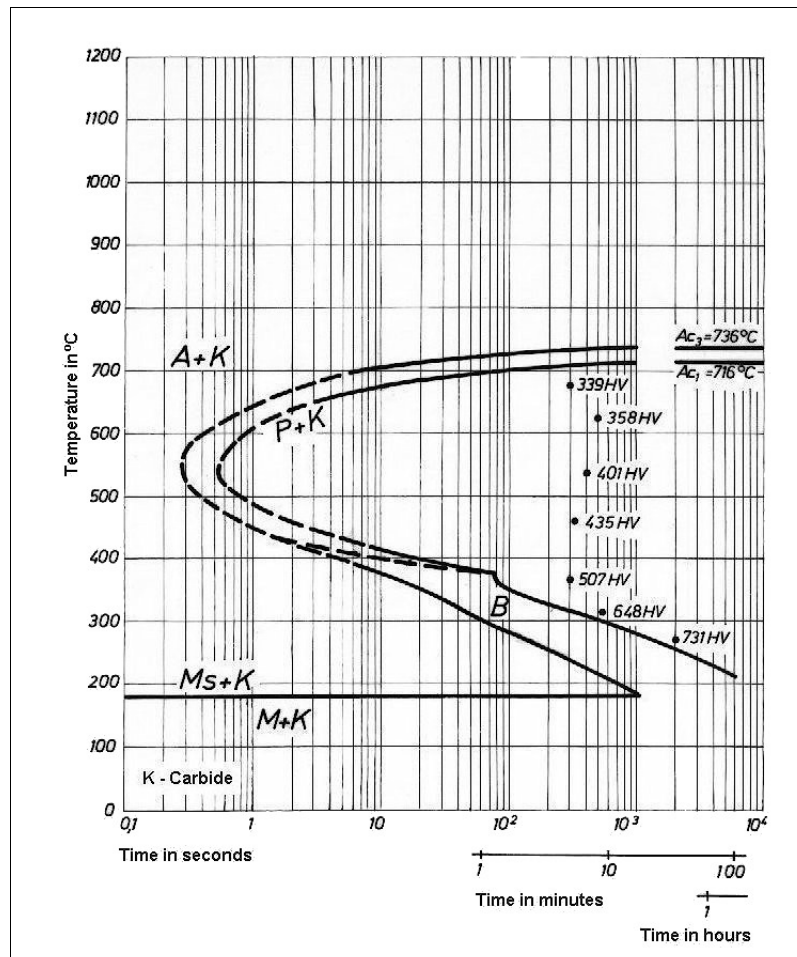
Coefficient of Linear Thermal Expansion $10^{-6} \text{ }^\circ\text{C}^{-1}$

20-100°C	20-200°C	20-300°C	20-400°C	20-500°C
11.1	12.1	12.9	13.5	13.9

Continuous Cooling Transformation (CCT) Diagram



Time-Temperature Transformation (TTT) Diagram



Soft Annealing

Heat to 680-720°C, cool slowly in furnace. This will produce a maximum Brinell hardness of 213.

Stress Relieving

Stress relieving to remove machining stresses should be carried out by heating to approx. 600-650°C, holding for 1-2 hours at heat, followed by air cooling. This operation is performed to reduce distortion during heat treatment.

Hardening

Harden from a temperature of 760-800°C followed by water. Hardness after quenching is 65 HRC.

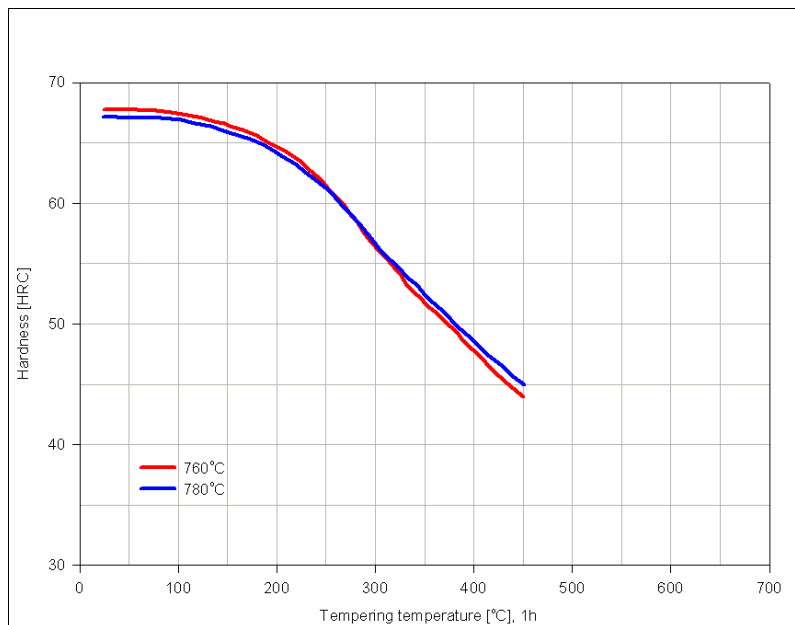
Tempering

Tempering temperature: See the data bellow.

Tempering Temperature (°C) vs. Hardness (HRC)

100°C	200°C	300°C	400°C	450°C
67	64	56	48	45

Tempering Diagram



Forging

Hot forming temperature: 1050-800°C.

Machinability

W1 is a plain carbon steel and machines with ease. It is the base line of 100% machinability on which machinability of the other tool steels is compared.

Corrosion Resistance

This is a plain carbon steel and it will corrode unless protected.

Welding

W1 may be welded by all of the standard techniques.

Forms manufactured: Please see the [Dimensional Sales Program](#).

Disclaimer

The information and data presented herein are typical or average values and are not a guarantee of maximum or minimum values. Applications specifically suggested for material described herein are made solely for the purpose of illustration to enable the reader to make his own evaluation and are not intended as warranties, either express or implied, of fitness for these or other purposes. There is no representation that the recipient of this literature will receive updated editions as the become available.

Unless otherwise specified, registered trademarks are property of SIJ Metal Ravne company. Copyright 2016 by SIJ Metal Ravne d.o.o. All rights reserved. Contact our [Sales Office](#) for more information.