



SIHARD 2379 Steel

Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SIHARD 2379	OCR12VM	1.2379	X155CrVMo12-1 †	X153CrMoV12	D2

Chemical Composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
1.53	0.35	0.40	12.00	1.0	-	0.85	-	-

Description

This alloy is one of the cold work, high carbon, high chromium type tool steels. D2 is a deep hardening, highly wear resistant alloy. It hardens upon air cooling so as to have minimum distortion after heat treatment.

Applications

Used for long run tooling applications where wear resistance is important, such as blanking or forming dies and thread rolling dies, cutting tools, stamping, woodworking, moulding tools for plastics. Toughness better than in D3. Possibility of nitriding.

Physical properties (average values) at ambient temperature

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

Density [g/cm^3]: 7.70

Thermal conductivity [W/m.K]: 20.0

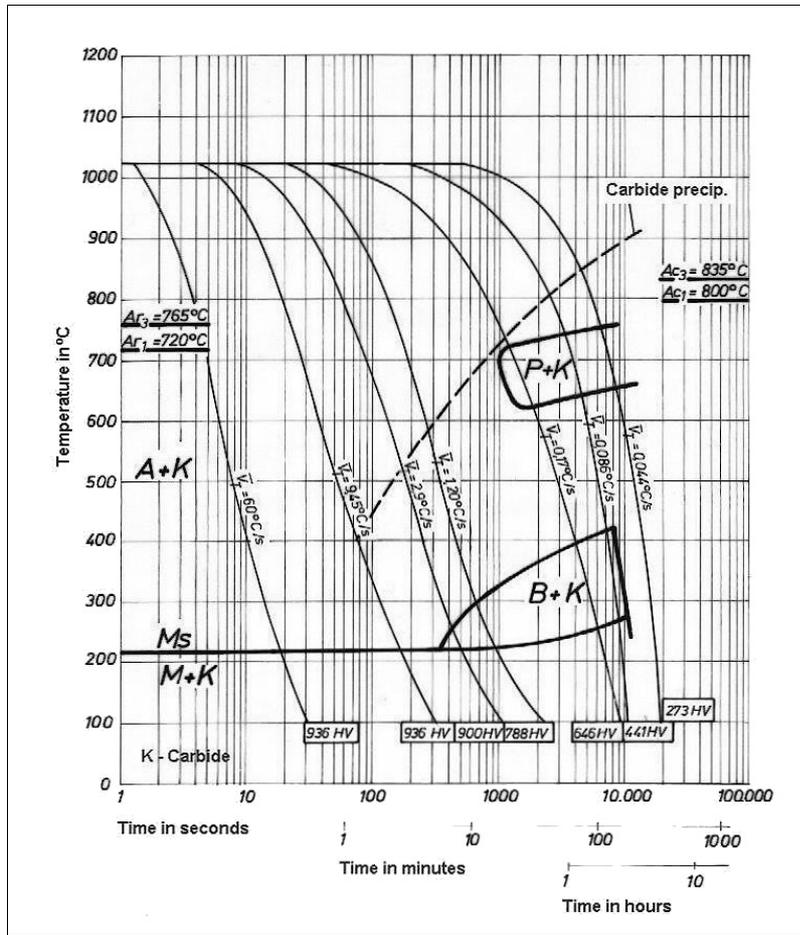
Electric resistivity [$\text{Ohm mm}^2/\text{m}$]: 0.65

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

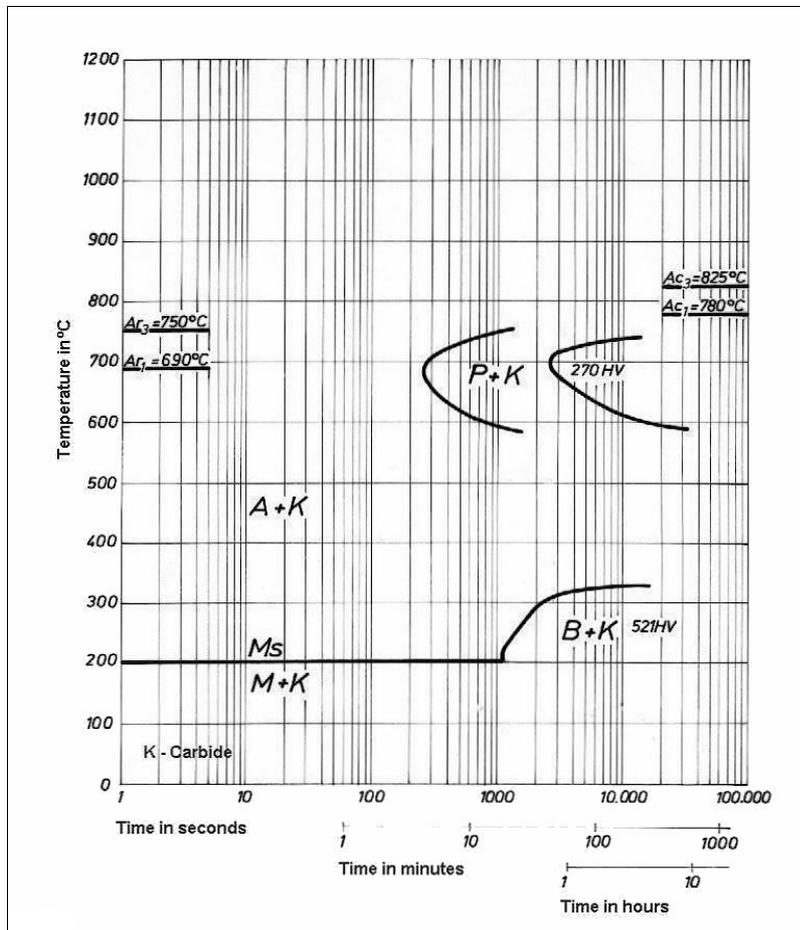
Coefficient of Linear Thermal Expansion $10^{-6} \text{ }^\circ\text{C}^{-1}$

20-100°C	20-200°C	20-300°C	20-400°C	20-500°C	20-600°C	20-700°C	20-800°C
9.8	11.7	12.1	12.8	12.9	13.0	13.2	13.5

Continuous Cooling Transformation (CCT) Diagram



Time-Temperature Transformation (TTT) Diagram



Soft Annealing

Heat to 840-880°C, cool slowly. This will produce a maximum Brinell hardness of 255. To secure uniform softness.

Stress Relieving

Stress relieving to remove machining stresses should be carried out by heating to 650-700°C, holding for one hour at heat, followed by air cooling. This operation is performed to reduce distortion during heat treatment.

Hardening

Harden from a temperature of 1000-1040°C followed by oil, warm bath (500-550°C, cooling bath or air. Hardness after quenching is 62-64 HRC.

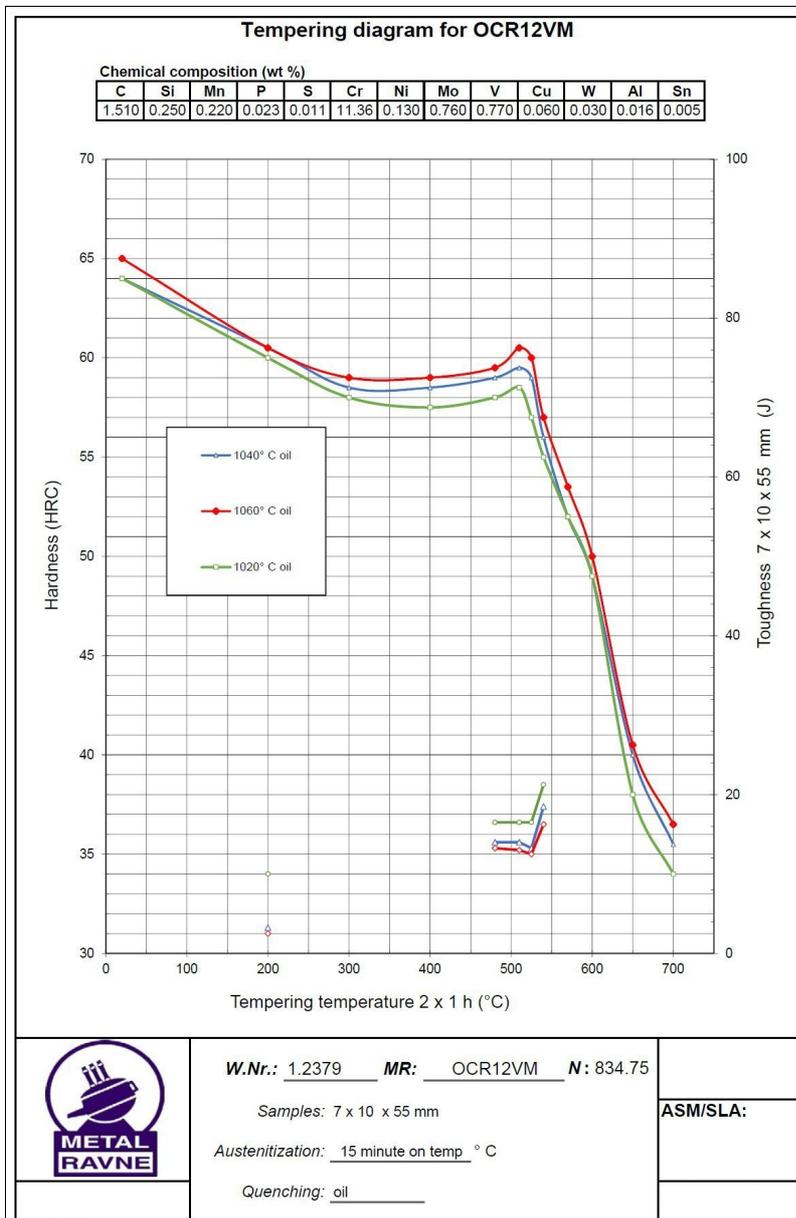
Tempering

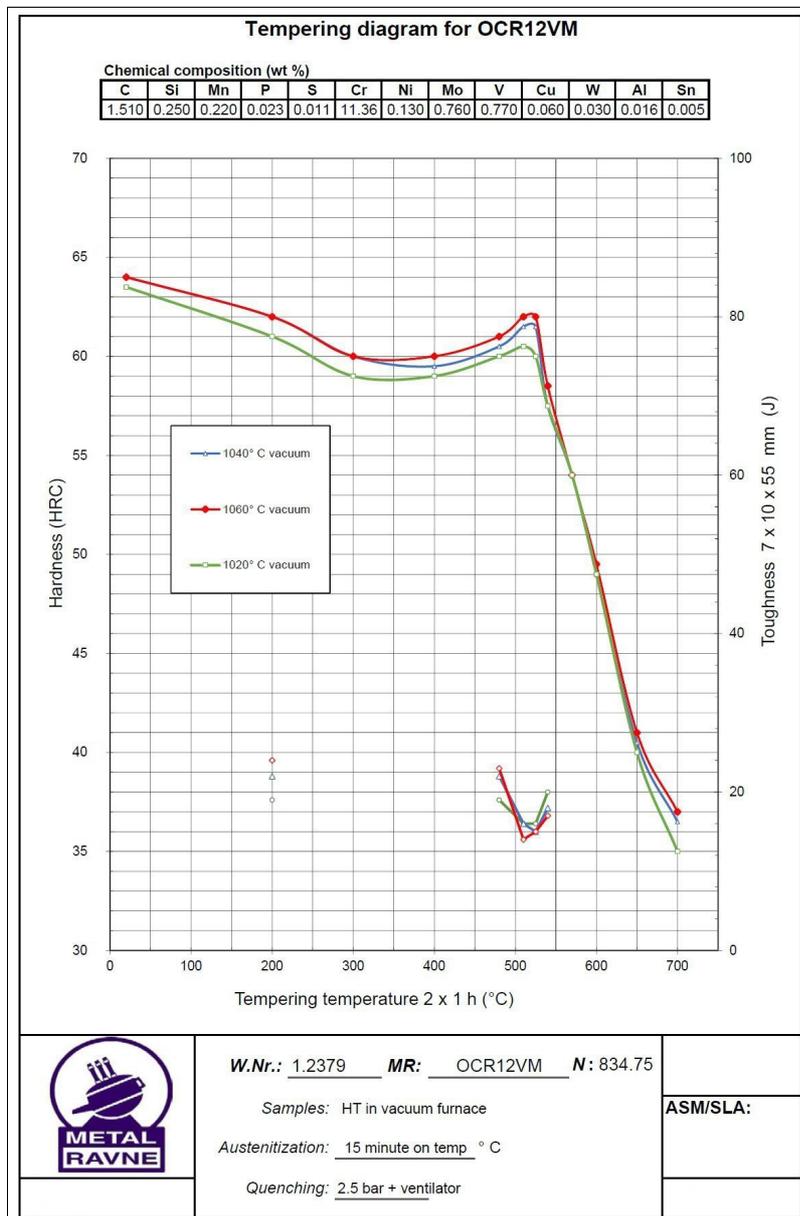
Tempering temperature: 150-550°C.

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

100°C	200°C	300°C	400°C	500°C	525°C	550°C	600°C	700°C
63	61	58	58	59	58	56	51	35

Tempering Diagrams





Forging

Hot forming temperature: 1050-850°C.

Machinability

Machinability of D2 is poor. Using the water hardening simple alloy tool steels (W group) as a base of 100 % the D2 alloy would rate about 50 % in machinability.

Corrosion Resistance

D2 is a steel alloy and is not corrosion resistant. It will rust unless protected.

Cold working

Cold working by conventional methods may be done with the alloy in the annealed condition.

Welding

Consult the alloy supplier for information as to welding.

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

Disclaimer

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