



## SIHARD 2601 Steel

### Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SIHARD 2601	OCR12EX	1.2601	X165CrMoV12	-	-

### Chemical Composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
1.65	0.33	0.30	11.50	0.60	-	0.30	0.50	-

### Description

Ledeburitic Cr-steel for high performance cutting tools, toughness better than D3, possibility of nitriding. This alloy possesses a very high compressive strength and is deep hardening.

### Applications

Cutting tools, stamping, woodworking, drawing, deep drawing and pressing tools, cold working rolls, measuring tools.

### Physical properties (average values) at ambient temperature

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

Density [ $\text{g/cm}^3$ ]: 7.70

Thermal conductivity [ $\text{W/m.K}$ ]: 20.0

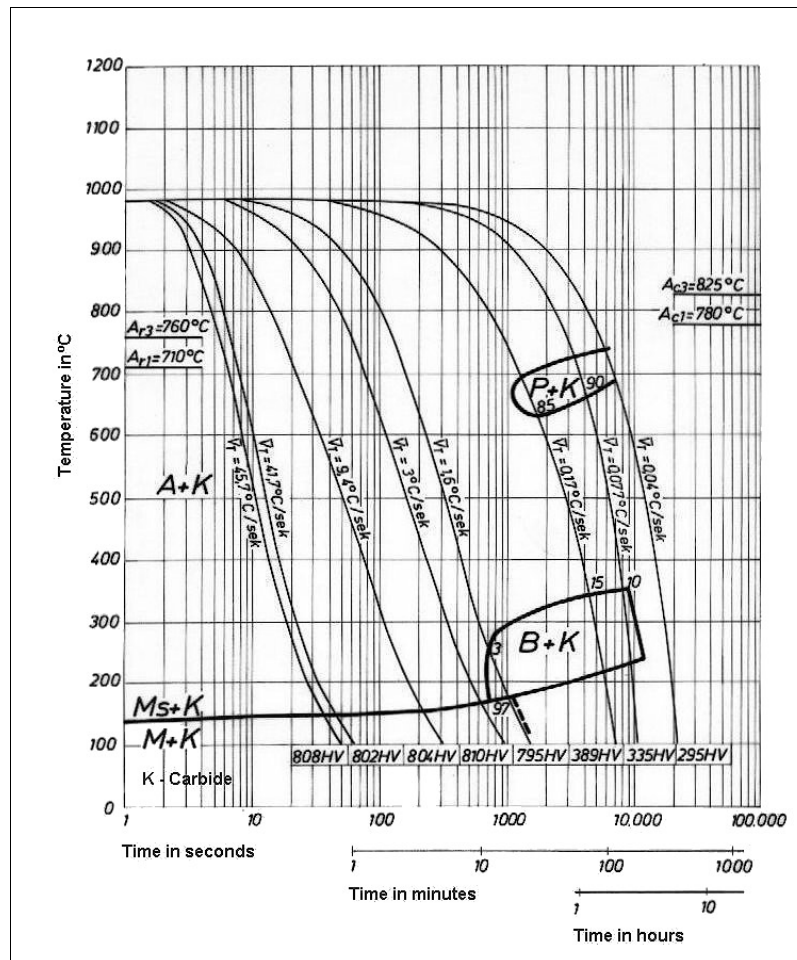
Electric resistivity [ $\text{Ohm mm}^2/\text{m}$ ]: 0.65

Specific heat capacity [ $\text{J/g.K}$ ]: 0.46

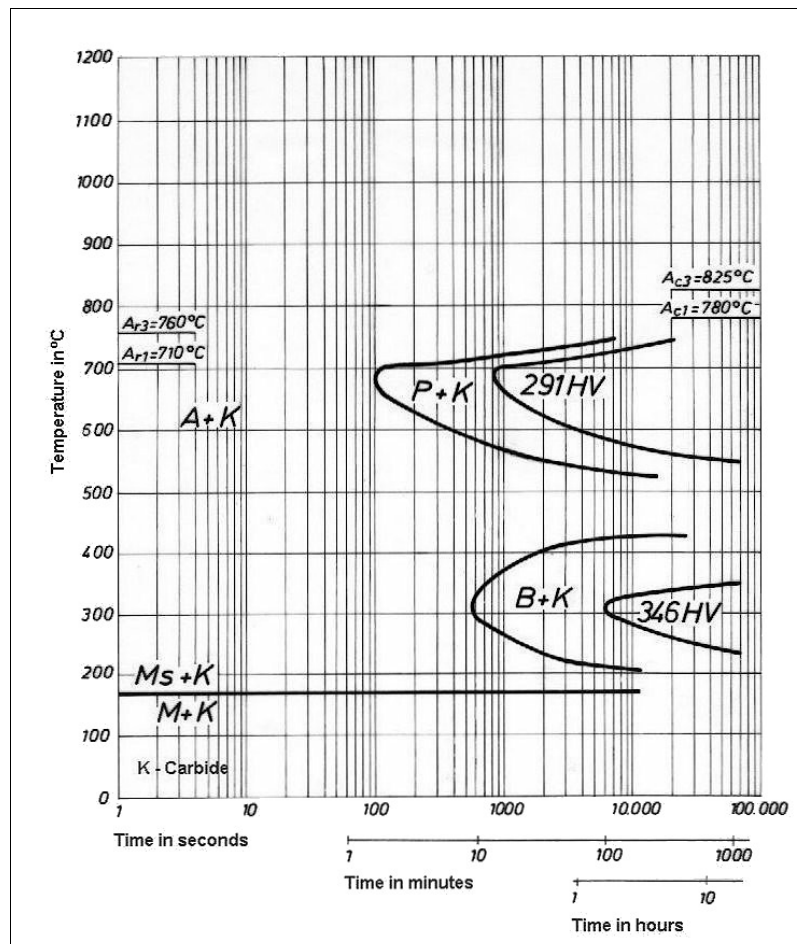
### Coefficient of Linear Thermal Expansion $10^{-6} \text{ }^\circ\text{C}^{-1}$

20-100°C	20-200°C	20-300°C	20-400°C	20-500°C
10.5	11.0	11.0	11.5	12.0

## Continuous Cooling Transformation (CCT) Diagram



## Time-Temperature Transformation (TTT) Diagram



### Soft Annealing

Heat to 800-840°C, cool slowly in furnace. This will produce a maximum Brinell hardness of 255.

### Stress Relieving

Stress relieving to remove machining stresses should be carried out by heating to 650°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 980-1010°C followed by oil, air quenching or warm bath quenching. Hardness after quenching is 63-65 HRC.

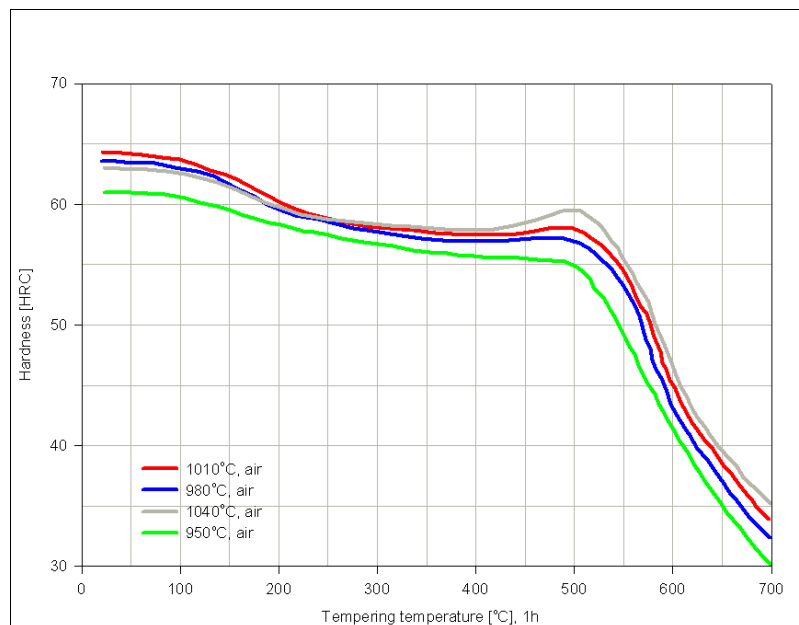
### Tempering

Tempering temperature: 150-400°C.

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

100°C	200°C	300°C	400°C
64	62	60	58

#### Tempering Diagram



### Forging

Hot forming temperature: 1050-850°C.

### Machinability

The machinability rating of OCR12EX is roughly 20-25% that of free machining carbon steel 1018. Due to its abrasion resistant nature, machining in the hardened condition should be limited to finish grinding.

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

### Disclaimer

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