



## SITHERM 2343 Steel

### Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SITHERM 2343	UTOPMO1	1.2343	X38CrMoV5-1 †	X37CrMoV5-1	H11

### Chemical Composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.37	1.0	0.38	5.15	1.30	-	0.40	-	-

### Description

H11 is one of the Hot Work, Chromium type tool steels. It is relatively low in carbon content and has good toughness and deep hardens by air quench from heat treatment. Good combination of toughness, hardness and wear resistance in hot. Resistance to softening and to cracking.

### Applications

H11 is often used for highly stressed structural parts such as aircraft landing gear. It resists softening at temperatures up to 537°C while retaining good ductility and toughness even at strength levels on the order of 275 ksi. Tools for hot forging of light metal. Pressure die casting tools. Dies, mandrels, punchers, knives, moulds. This grade can be water cooled. For most highest requirements we recommended UTOPMO1 EFS.

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

Modulus of elasticity [ $10^3 \times \text{N/mm}^2$ ]: 215, 176 (at 500°C), 165 (at 600°C)

Density [ $\text{g/cm}^3$ ]: 7.80, 7.64 (at 500°C), 7.60 (at 600°C)

Thermal conductivity [ $\text{W/m.K}$ ]: 25, 28.5 (at 500°C), 29.3 (at 600°C)

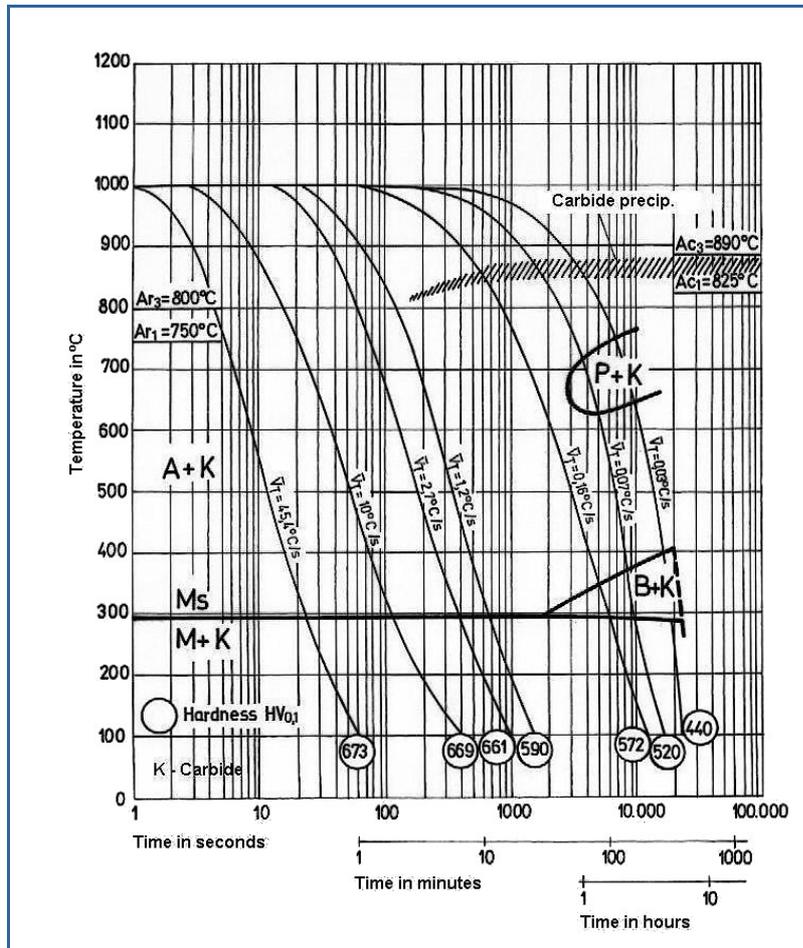
Electric resistivity [ $\text{Ohm mm}^2/\text{m}$ ]: 0.52, 0.86 (at 500°C), 0.96 (at 600°C)

Specific heat capacity [ $\text{J/g.K}$ ]: 0.46, 0.55 (at 500°C), 0.59 (at 600°C)

### 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	20-700°C
9.8	12.5	13.0	13.2	13.5	13.7	13.8	14.0

## Continuous Cooling Transformation (CCT) Diagram



### Soft Annealing

Heat to 800-840°C, cool slowly in furnace. This will produce a maximum Brinell hardness of 229.

### 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 1000-1040°C followed by air, oil quenching or warm bath quenching 500-550°C. Hardness after quenching is 50-56 HRC.

### Tempering

Tempering temperature: See the data bellow.

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

100°C	200°C	300°C	400°C	500°C	550°C	600°C	650°C	700°C
53	52	52	52	54	52	48	38	30
1845	1790	1790	1790	1910	1790	1570	1200	970

Tempering Diagram

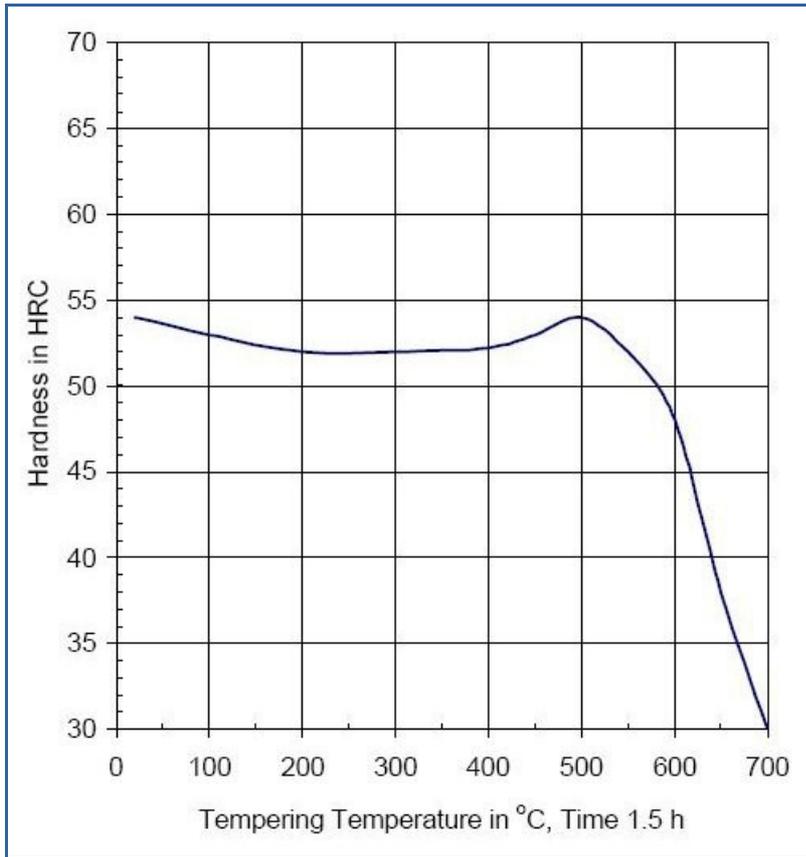
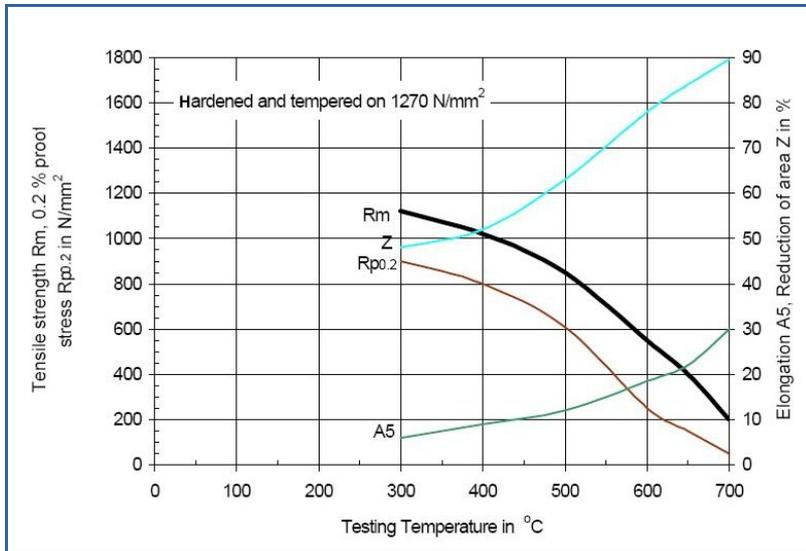
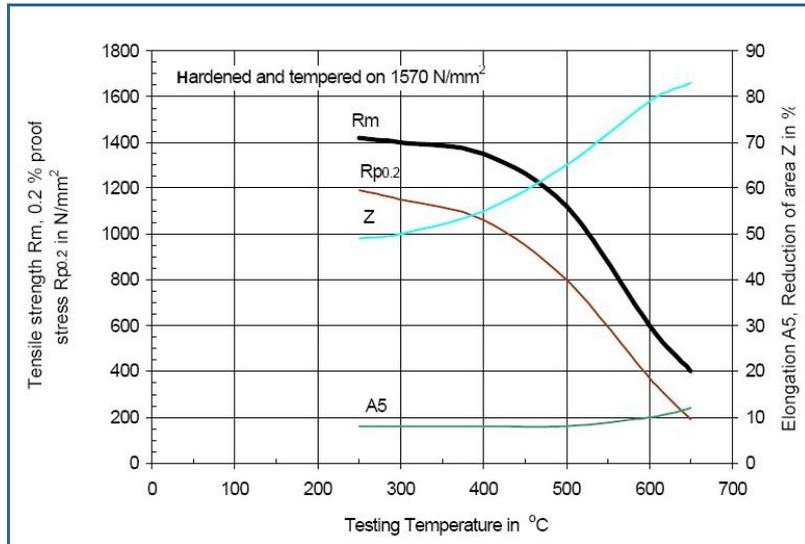


Diagram Tempering Temperature - Mechanical Properties



## Diagram Tempering Temperature - Mechanical Properties



### Forging

Hot forming temperature: 1100-900°C.

### Cold Working

Cold working may readily be accomplished on H11 by conventional methods.

### Machinability

Machinability is reasonably good, approximately 75% that of the W group water hardening low alloy tool steels.

### Corrosion Resistance

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

### Welding

H11 is a readily weldable alloy by conventional methods.

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

### Disclaimer

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