



SITHERM 2344 Steel

Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SITHERM 2344	UTOPMO2	1.2344	-	X40CrMoV5-1	H13

Chemical Composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.39	1.00	0.38	5.15	1.35	-	1.00	-	-

Description

This alloy is one of the hot work, chromium type tool steels. It also contains molybdenum and vanadium as strengthening agents. The chromium content assists this alloy to resist softening if used at higher temperatures. Secondary hardening steels with good tempering resistance. It maintains high hardness and strength at elevated temperatures. Good resistance to thermal fatigue, erosion and wear. Steel with very high toughness and good ductility and hardenability. Tools can be water cooled.

Applications

H13 finds applications for hot die work, die casting and extrusion dies, wear resisting tools, pressure die casting tools, pressing tools for light and heavy metal. For the highest requirements we recommended UTOPMO2 ESR EFS.

Physical properties (average values) at ambient temperature

Modulus of elasticity [$10^3 \times \text{N/mm}^2$]: 215

Density [g/cm^3]: 7.78

Thermal conductivity [W/m.K]: 25.0

Electric resistivity [$\text{Ohm mm}^2/\text{m}$]: 0.52

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

Thermal conductivity [W/m.K]

20°C	500°C	600°C
25	28.5	29.3

Density [g/cm^3]

20°C	500°C	600°C
7.78	7.64	7.60

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

20°C	500°C	600°C
0.52	0.86	0.96

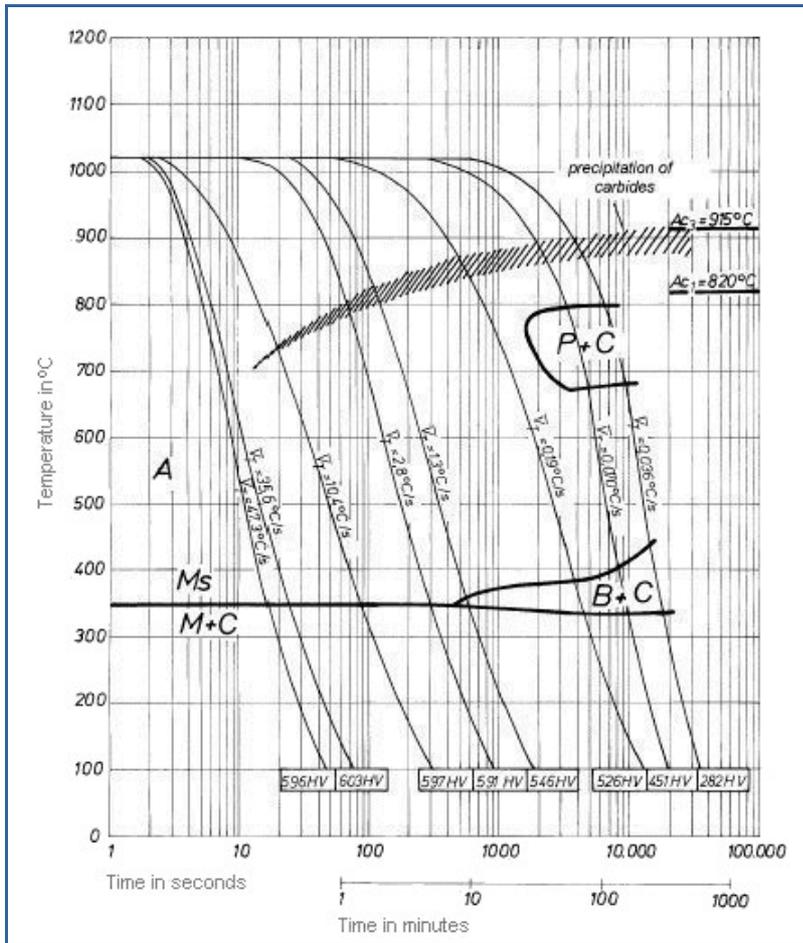
Specific heat capacity[J/g.K]

20°C	500°C	600°C
0.46	0.55	0.59

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
10.7	11.9	12.2	12.5	12.7	13.1	13.5	13.7

Continuous Cooling Transformation (CCT) Diagram



Soft Annealing

Heat to 760-810°C, cool slowly in furnace. This will produce a maximum Brinell hardness of 229.

Hardening

Harden from a temperature of 1020-1060°C followed by oil, air quenching or warm bath (450-550°C). Hardness after quenching is 52-56 HRC.

Tempering

Tempering temperature: See the diagram below.

Tempering Temperature (°C) vs. Hardness (HRC) vs. Tensile Strength (N/mm²)

100°C	200°C	300°C	400°C	500°C	550°C	600°C	650°C	700°C
53	52	51	52	54	53	50	43	31
1845	1790	1730	1790	1910	1845	1680	1360	995

Tempering Diagram

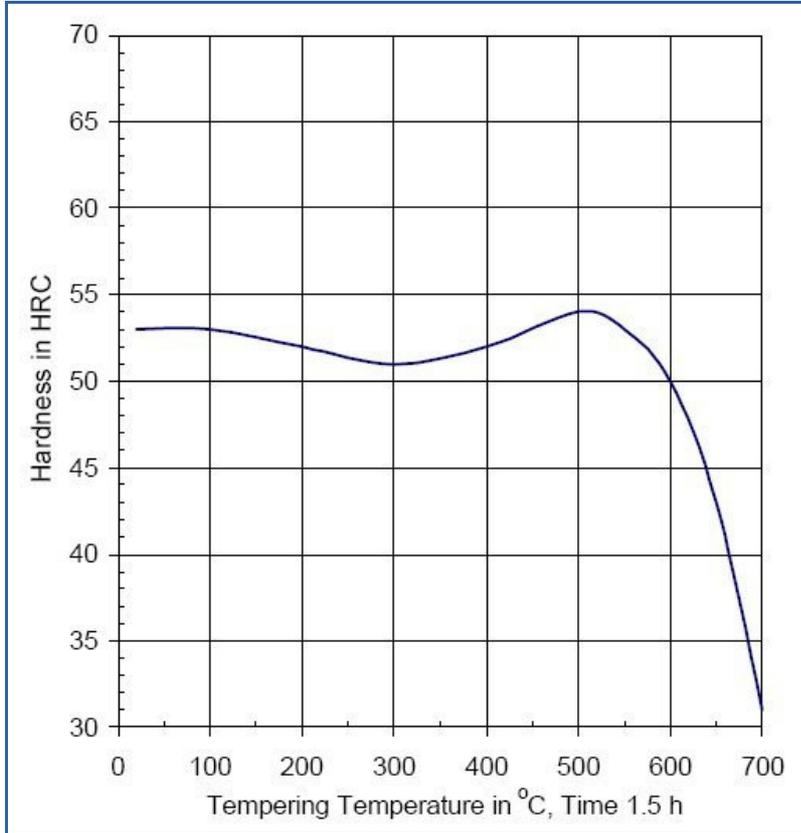
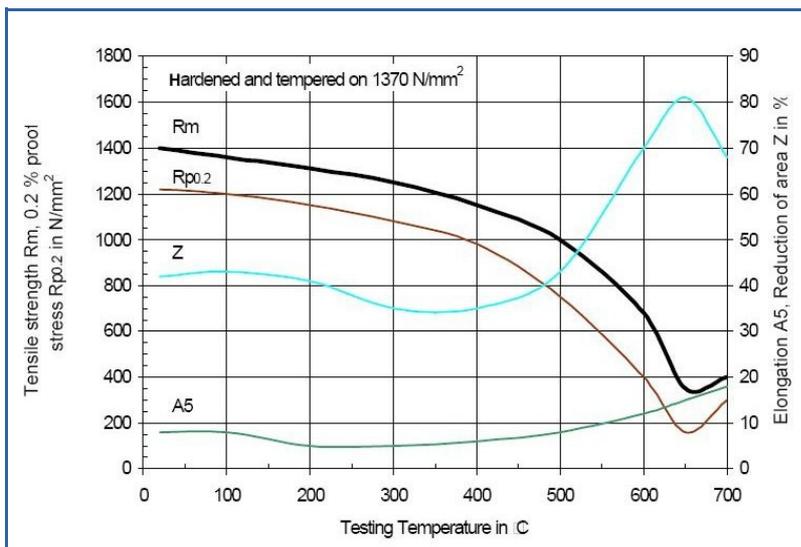


Diagram Tempering Temperature - Mechanical Properties



Forging

Hot forming temperature: 1100-900°C.

Machinability

Machinability of H13 is medium to good. It rates as 75 % that of the W group water hardening tool steels which are low alloy and of generally good machinability.

Corrosion Resistance

This alloy has some corrosion resistance due to its chromium content. However it is still a steel and will rust unless given protective coating.

Welding

This alloy is weldable. Contact the alloy supplier for information on welding procedures.

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

Disclaimer

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