HTS

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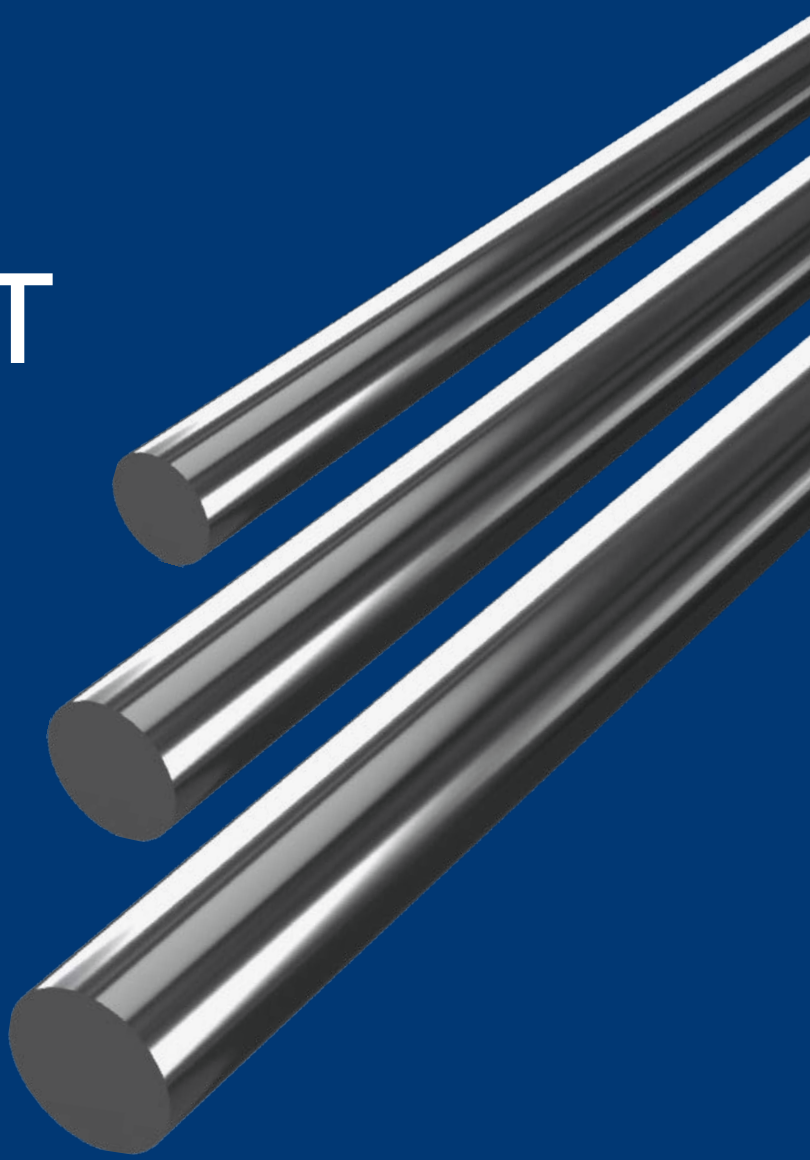
SINOXX 4112 stainless steel

DATA SHEET

SINOXX 4112



This is a highly corrosion-resistant stainless steel, classified as martensitic chromium steel, with the addition of molybdenum and vanadium. It offers a combination of high hardness, wear resistance, and excellent corrosion resistance. The material also exhibits good strength and the capability to achieve and maintain exceptional hardness (up to HRC 58) along with superior wear resistance.

Designations by standards

Brand Name	Ravne	Mat. No.	DIN	EN	UNS
SINOXX 4112	OCR6	1.41	X90CrMoV18	-	S44003

Chemical composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.90	max 1.0	max 1.0	18.0	1.10	-	0.10	-	-

Applications

Ball bearings and races, gage blocks, moulds and dies, cutlery, valve components, knives and measuring instruments.

Physical properties (average values) at ambient temperature

Modulus of elasticity

Modulus of elasticity [10^3 x N/mm^2]:
190-210

Density

Density [g/cm^3]:
7.68

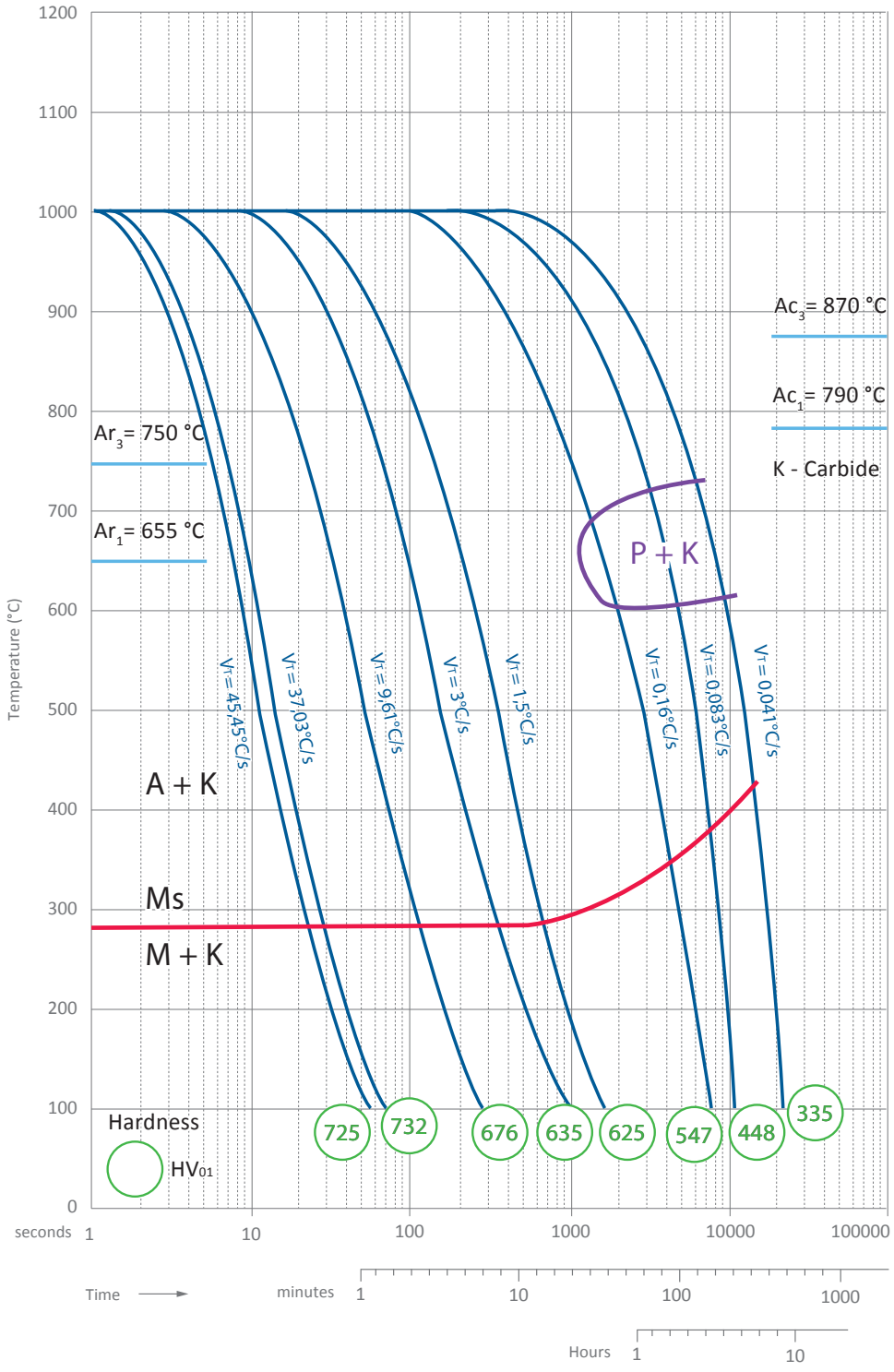
Thermal conductivity [W/m.K]

200 °C	400 °C	500 °C	600 °C	700 °C
24.8	31.5	26.8	24.1	22.5

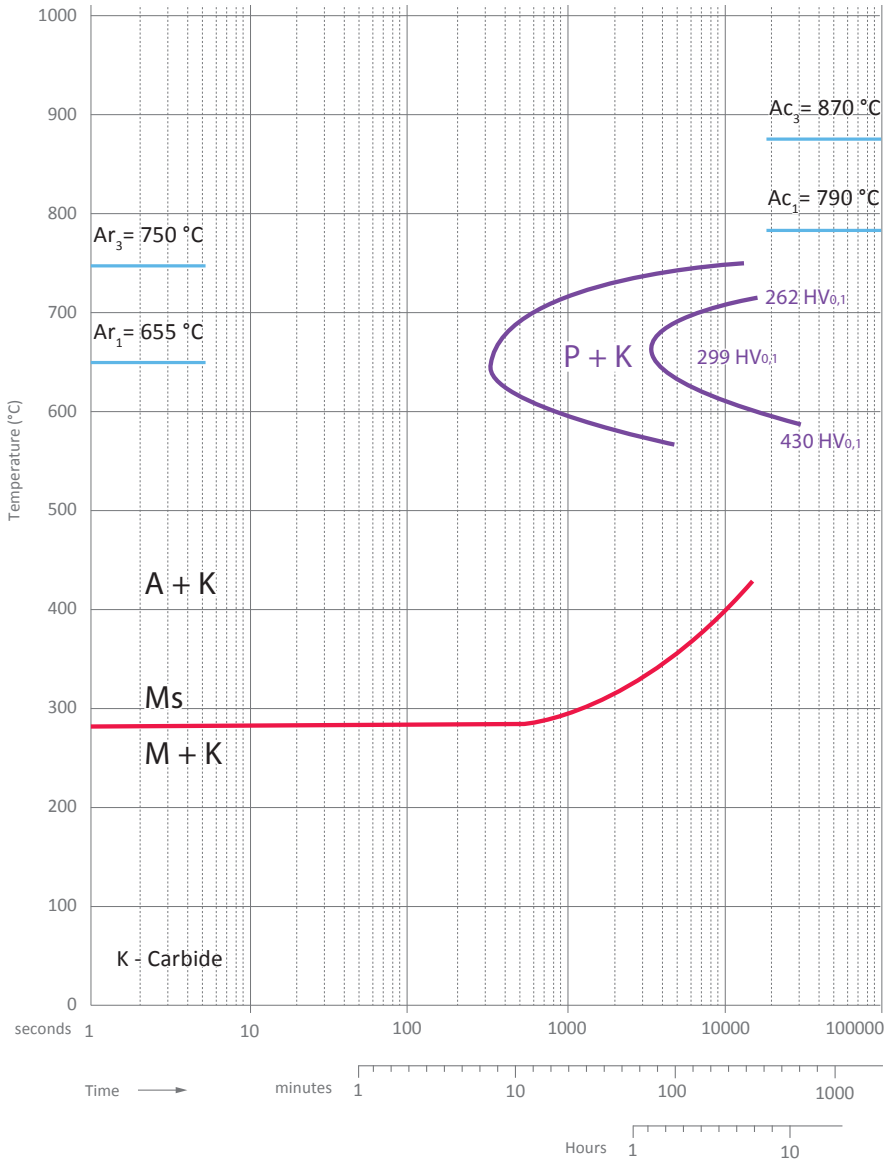
Coefficient of linear thermal expansion 10-6 °C-1

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	10.5	10.9	11.2	11.3	11.3	11.5	11.8

Continuous cooling curves - CCT diagram



Time-temperature transformation (TTT) diagram



Soft annealing

Heat to 810-860 °C, cool slowly in furnace. This will produce a maximum Brinell hardness of 265.

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 1000-1050 °C followed by oil quenching. Hardness after quenching is 56 HRC.

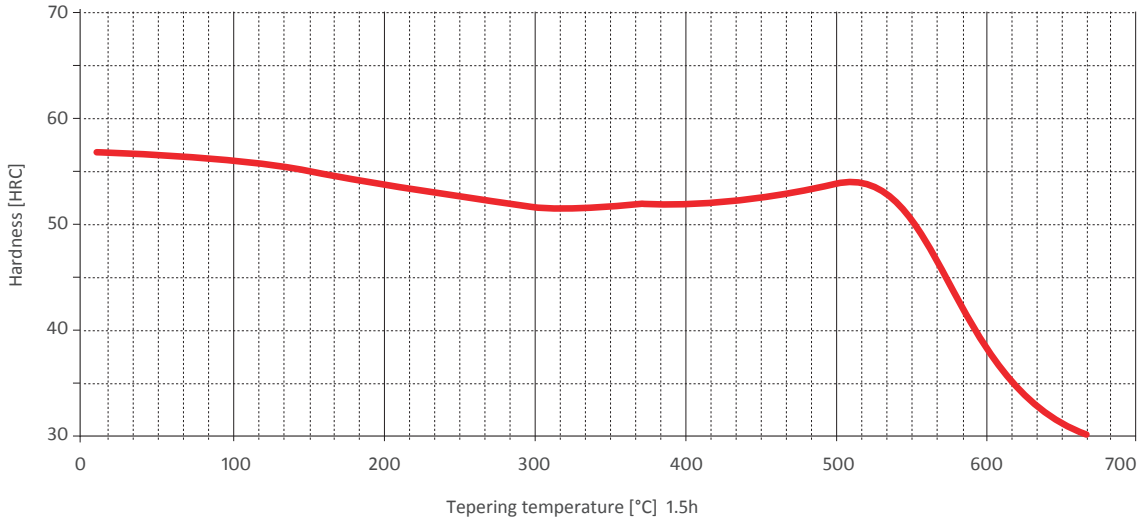
Tempering

Tempering temperature: up to 150 °C.

Tempering temperature (°C) vs. hardness (HRC) diagram

100 °C	200 °C	300 °C	400 °C	500 °C	550 °C	600 °C	650 °C	700 °C
56	54	52	53	54	51	40	33	29

Tempering Diagram



Forging

Pre-heat to 760 °C, then bring slowly up to 1038-1204 °C before proceeding. Do not work this material below 927 °C. Cool material slowly after working and once at room temperature, anneal fully.

Machinability

Best machined in the annealed condition. Tough, stringy chips can be best handled by the use of chip breakers. Carbide or ceramic tooling is recommended.

Corrosion resistance

Resistant to a wide variety of media including fresh water, steam, petroleum products and alcohol.

Welding

Not commonly welded due to its tendency to air harden. If it must be welded, preheat to 260 °C and post weld treat at 732- 760o °C for 6 hours followed by a slow furnace cooling to avoid cracking.

Cold working

Only slightly cold workable by common procedures.

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