SINOXX 4313

MARTENSITIC STAINLESS STEEL

SPECIFICATION SHEET

SINOXX 4313 is a martensitic stainless steel offering good strength and toughness properties in combination with good corrosion resistance and reliable weldability.

CHEMICAL COMPOSITION

Element	C	Si	Mn	P	S	Cr	Mo	Ni	N
min						12.00	0.30	3.50	0.020
max	0.05	0.70	1.50	0.040	0.015	14.00	0.70	4.50	

APPLICATIONS

Steel is used for parts subjected to high mechanical stress in fittings and pump construction, for compressors and turbines in hydroelectric power stations, and and refrigerating systems.

MICROSTRUCTURE

Fig. 1: Microstructure of SINOXX 4313

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PHYSICAL PROPERTIES (average values) at ambient temperature

Modulus of elasticity

Modulus of elasticity [10^3 x N/mm^2]:
200, 185 (200 °C), 170 (400 °C)

Density

DENSITY [g/cm^3] T: 20 °C
7.7

Electric resistivity

ELECTRIC RESISTIVITY (Ohm.mm^2/m)
0.6

Specific heat capacity

SPECIFIC HEAT CAPACITY (J/(g. K))
20 °C
0.43

Thermal conductivity

THERMAL CONDUCTIVITY (W/(m.K)
20 °C
25.0

TEMPERATURE RANGE (°C)

- Hot forming – 1150°C to 900°C, then air cooling.
- Soft annealing – heat to 600 - 650°C then cool slowly in furnace.
- Hardening – heat to 950 – 1050°C then fast cool in oil or air.
- Tempering QT 700 – heat to 650 – 700°C + 600 – 620°C / air.
- Tempering QT 750 – heat to 550 – 600°C / air.
- Tempering QT 900 – heat to 520 – 580°C / air.

Microstructure after annealing: martensite + ferrite.

Microstructure after hardening and tempering: martensite + ferrite.

CONTINUOUS COOLING CURVES-CCT diagram

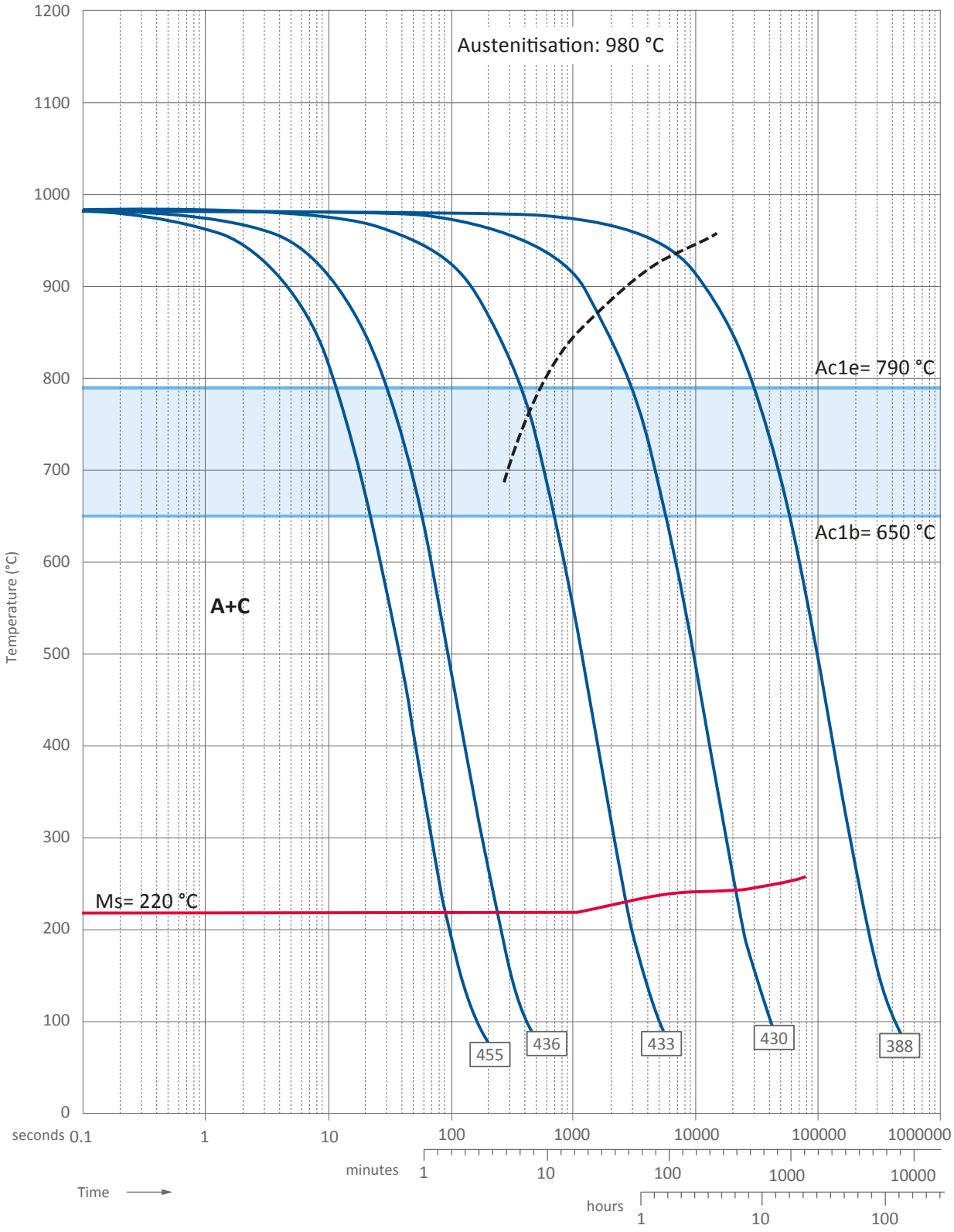

Fig. 2: CCT diagram (dr.Sommer Werkstofftechnik GmbH – Copyright 2015)

Tempering diagram

Hardness/Tempering temperature:

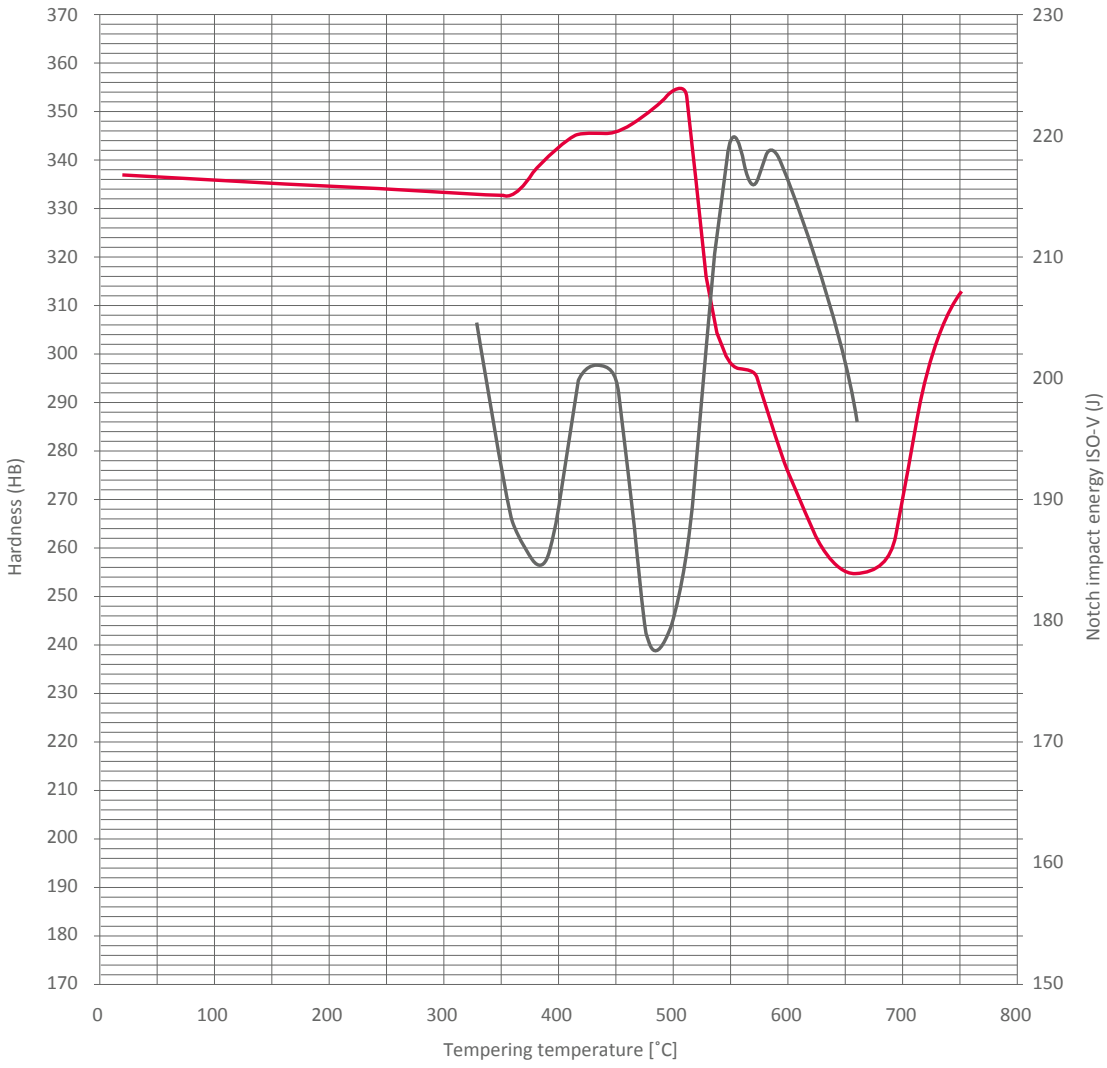

Fig. 3: Tempering diagram (SIJ Metal Ravne)

MECHANICAL PROPERTIES AT AMBIENT TEMPERATURE

Condition: annealed

Hardness: max .320 HB

Tensile strength: max. 1100 N/mm²

For QT 700

0.2% Proof Stress: 520 N/mm²

Tensile strength: 700-850 N/mm²

Elongation (A5): 15% (longit., d<=60 mm), 12% (transv., 160<=d<=250 mm)

Notch impact energy (ISO-V): 70 J (longit., d<=60 mm), 50 J (transv., 160<=d<=250 mm)

For QT 780

0.2% Proof Stress: 620 N/mm²

Tensile strength: 780-980 N/mm²

Elongation (A5): 15% (longit., d<=60 mm), 12% (transv., 160<=d<=250 mm)

Notch impact energy (ISO-V): 70 J (longit., d<=60 mm), 50 J (transv., 160<=d<=250 mm)

For QT 900

0.2% Proof Stress: 800 N/mm²

Tensile strength: 900-1100 N/mm²

Elongation (A5): 12% (longit., d<=60 mm), 10% (transv., 160<=d<=250 mm)

Notch impact energy (ISO-V): 50 J (longit., d<=60 mm), 40 J (transv., 160<=d<=250 mm)

MACHINABILITY

Metal cutting machining is the same as that for special alloyed engineering steel grades of corresponding strength.

WELDABILITY

Good weldability using the manual arc. TIG and submerged-arc welding processes. The filler material is Thermanit.

Disclaimer

The information and data presented herein are typical or average values and are not a guarantee of the maximum or minimum values. Applications specifically suggested for material described herein are made solely for the purpose of illustration to enable the reader to make his own evaluation and are not intended as warranties, either express or implied, of fitness for these or other purposes. There is no representation that the recipient of this literature will receive updated editions as they become available.

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