

SANMAC® 4305 HOLLOW BAR

DATASHEET

Sanmac® 4305 is an austenitic chromium-nickel steel with extremely high machinability. For example, cutting speeds of up to twice those for Sanmac 304/304L can be used.

STANDARDS

- MT 303
- S30300
- 1.4305

Product standards

- EN 10297-2, EN 10294-2
- ASTM A511

CHEMICAL COMPOSITION (NOMINAL) %

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Si kali	≤0.03	35	Skaller.	Skafred Skafred	0.4	Staling Staling	1.8	≤0.040	and Statement Statement	0.2	17.5	State

FORMS OF SUPPLY

Hollow bar- Finishes, dimensions and tolerances

Hollow bar in Sanmac 4305 can be produced in various sizes in the solution annealed and white-pickled condition.

Dimensions are given as outside and inside diameters with guaranteed component sizes after machining, see catalogues.

Outside diameter tolerance is +2/-0%, but minimum +1/-0mm Inside diameter tolerance is +0/-2%, but minimum +0/-1mm Straightness +/-1.5mm/m

Better tolerances can be supplied on special order.

Other forms of supply Bar

Steel with improved machinability, Sanmac, is also available in bar.

MECHANICAL PROPERTIES

At 20°C (68°F)

Metric units

Proof strength	Tensile strength	Elong.	Hardness
Rp0.2a Rp1.0a	graff Rm garaff garaff garaff garaff	Ab / A2"	HRB grand grand grand grand grand

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Imperial units

Proof stren	gth of of	Tensile strength	Jedins Status Status	Elong.	Steams Steams Steams	Hardness
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ksi	ksi	ksi	Jacks States States	%	%	
≥30	≥33	≥75	Trade Trade Trade	≥35	≥35	≤90

 $¹ MPa = 1N/mm^2$

- a) Rp0.2 and Rp1.0 correspond to 0.2% offset and 1.0% offset yield strength, respectively.
- b) Based on $L0 = 5.65 \, \text{OS} \, 0$ where L0 is the original gauge length and S0 the original cross-section area.

Impact strength

Sandvik Sanmac® 4305 possesses good impact strength both at room temperature and at low temperatures.

PHYSICAL PROPERTIES

Density: 7.9 g/cm3, 0.29 lb/in3

Thermal conductivity

Temperature, °C	W/m °C	Temperature, °F	Btu/ft h °F					
20	15	68	8.5					
100	16	200	9.5					
200	18	400	19.5					
300	20	600	/ / 12 / J J J					
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Specific heat capacity

Temperature, °C	J/kg°C	Temperature, °F	Btu/lb °F
20	475	68	0.11
100	500	200 , , , , , , , , , , , , , , , , , ,	0.12
200	530	400	,0.13
300 grade grade grade grade	560	600	get 0.13 get get get get g
400	580	/ 800 / J J J	garden garden garden garden garden garden
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600 5 5 5 5	3 615 J 3 6	1200 % 3 3 3 3	9 0.15 3 day 3 day 3 day 3 day
700	625	1300	0.15

Thermal expansion, mean values in temperature ranges (x10-6)

Temperature, °C	Per °C	Temperature, °F	Per °F			
30-100	16.5	86-200	9.5			
30-200		86-400	9.5			
30-300	17.5	86-600	gan gan 10° gan gan gan			
30-400	/ 18/	86-800	3 m 10 m 3 m 3 m 3 m 3 m 3 m 3 m 3 m 3 m 3 m			
30-500	/ 18.5	86-1000	10 36 36 36			
30-600	18.5	86-1200	10.5			
30-700 / / / / / / /	19 mm 34 mm 34 mm 34	86-1400	30.5			

Modulus of elasticity

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CORROSION RESISTANCE

General corrosion

Sandvik Sanmac® 4305 has good resistance to:

- Organic acids at moderate temperatures, with the exception of formic acid
- Sulphates, sulphides and sulphites
- Caustic solutions at moderate temperatures
- Oxidizing acids like nitric acid

Intergranular corrosion

Sandvik Sanmac® 4305 has a low carbon content and therefore good resistance to intergranular corrosion.

Stress corrosioncracking

Austenitic steels are susceptible to stress corrosion cracking. This may occur at temperatures above about 60°C (140°F) if the steel is subjected to tensile stresses and at the same time comes into contact with certain solutions, particularly those containing chlorides. In applications demanding high resistance to stress corrosion cracking the austenitic-ferritic steels Sandvik SAF 2304®, Sandvik 10RE51 or Sandvik Sanmac® 2205 have higher resistance to stress corrosion cracking than 4305.

Pitting and crevice corrosion

The steel may be sensitive to pitting and crevice corrosion even in solutions of relatively low chloride content. Molybdenum-alloyed steels have better resistance and the resistance improves with increasing molybdenum content.

WELDING

Despite very high sulphur levels in Sandvik Sanmac® 4305, welding is comparable with that for 18/8 stainless steels (e.g.Sanmac® 304L) if filler metal is used and the fusion between base material and filler metal is kept low.

Suitable welding methods are manual metal arc welding (MMA) with covered electrodes and gas shielded arc welding with the TIG and MIG methods as first choice. No pre-heating is necessary, and post weld heat treatment is normally notnecessary.

Since the material has low thermal conductivity and high thermal expansion, welding must be carried out with low heat input, and with welding plans well thought out in advance, so that deformation of the weld joint can be kept under control. If, despite these precautions, it is foreseen that residual stresses might impair the structures performance, we recommend that the entire structure is stress relieved.

Recommendations of fillermetal:

TIG (GTAW/141)	22.15.3.L, 22.8.3.L ,18.8.Mn
MIG (GMAW/131)	22.15.3.L, 22.8.3.L ,18.8.Mn
MMA (SMAW/111)	23.12.2.LR, 24.13.LHF

APPLICATIONS

Sammaco 4305 is a good choice for components where high machinability is needed, but where corrosion resistance and high stresses are not a concern.

Disclaimer: Recommendations are for guidance only, and the suitability of a material for a specific application can be confirmed only when we know the actual service conditions. Continuous development may necessitate changes in technical data without notice. This datasheet is only valid for Sandvik materials.

