

SANMAC 329

BAR

DATASHEET

Sanmac 329 is a duplex stainless steel with optimized sulfur content and inclusion morphology for improved machinability. The grade is characterized by:

- Excellent machinability
- High mechanical strength
- Very good resistance to pitting and stress corrosion cracking

STANDARDS

- EN Number: 1.4460

Product standard

- EN 10088-3

CHEMICAL COMPOSITION (NOMINAL)

Chemical composition (nominal) %

C	Si	Mn	P	S	Cr	Ni	Mo	N
≤0.05	≤1.0	≤2.0	≤0.035	≤0.030	25.5	5	1.5	0.08

APPLICATIONS

Sanmac 329 is especially suited for the manufacture of components for pumps and other equipment used in, for example, alkaline environments commonly found in the pulp and paper industry.

CORROSION RESISTANCE

Sanmac 329 has a Pitting Resistance Equivalent (PRE*) of ≥31.

*The PRE is defined as, in weight %:

$$PRE = \% Cr + 3.3 \times \% Mo + 16 \times \% N$$

Sanmac 329 has very good resistance to stress corrosion cracking in chloride environments. The grade has also good resistance to general corrosion in acidic media, thanks to the high chromium content and alloying with molybdenum.

FORMS OF SUPPLY

Bar

Finishes and dimensions

The standard size range for bar steel in Sanmac 329 is 75-180 mm. Round bar is supplied in the solution annealed, quenched and peel-turned condition.

Lengths

Bars are delivered in random lengths of 3-7 m, depending on diameter.

Straightness

Diameter, mm	Height of arch, mm/m Typical value
> 75	2

Tolerances

Diameter, mm	Tolerances, mm
75-95	-0/+1.00
95-180	-0/+1.50

Surface conditions

Surface conditions	Ra, μm Typical value	Diameter, mm
Peeled and burnished	1	75-180

MECHANICAL PROPERTIES

At 20°C (68°F)

Metric units

Proof strength		Tensile strength		Elong.	Hardness
R _{p0.2} ^{a)}	R _{p1.0} ^{a)}			A ^{b)}	Brinell
MPa	MPa	MPa		%	
≥450		620-880		20	≤260

Imperial units

Proof strength		Tensile strength		Elong.	Hardness
R _{p0.2} ^{a)}	R _{p1.0} ^{a)}			A ^{b)}	Brinell
ksi	ksi	ksi		%	
≥65		90-128		20	≤260

1 MPa = 1 N/mm²

a) R_{p0.2} and R_{p1.0} correspond to 0.2% offset and 1.0% offset yield strength respectively.

b) Based on L₀ = 5.65√S, where L₀ is the original gauge length and S₀ the original cross-sectional area.

Impact strength at room temperature

PHYSICAL PROPERTIES

Density

7.8 g/cm³, 0.28 lb/in³

Specific heat capacity

20°C: 500 J/(kg °C)

68°F: 0.12 Btu/(lb °F)

Thermal conductivity

20°C: 15 W/(m °C)

68°F: 9 Btu/(ft h °F)

Thermal expansion, mean values in temperature ranges (X10-6)

Metric units

Temperature, °C	30-100	30-200	30-300
Per °C			
Sanmac 329	13.0	13.5	14.0
Carbon steel	12.5	13.0	13.5
ASTM 316L	16.5	17.0	17.5

Imperial units

Temperature, °F	86-200	86-400	86-600
Per °F			
Sanmac 329	7.0	7.5	7.8
Carbon steel	6.8	7.0	7.5
ASTM 316L	9.0	9.5	9.8

Sanmac 329 has a far lower coefficient of thermal expansion than austenitic stainless steels and can therefore possess certain design advantages.

Resistivity

20°C: 0.8 μΩm

68°F: 31.5 μΩin.

Modulus of elasticity (x103)

Temperature, °C	MPa	Temperature, °F	ksi
20	200	68	29.0
100	194	200	28.2
200	186	400	27.0
300	180	600	26.2

MACHINING

RECOMMENDED INSERTS AND CUTTING DATA STARTING VALUES

Turning

Insert geometry	Grade	Feed	Cutting speed (m/min.)
MF	GC2015	0.15	210
MM	GC2025	0.30	190

Thread turning

Insert geometry	Grade	Cutting speed (m/min.)
F	GC1135	120

Thread tapping

Cutting speed (m/min.)	
4-12	Cutting speeds in the upper range should be chosen for coated threading taps.

Parting off

Insert geometry	Grade	Feed (mm/rev)	Cutting speed (m/min.)
CM	GC1145	0.08-0.12	100

Grooving

Insert geometry	Grade	Feed (mm/rev)	Cutting speed (m/min.)
GF	GC2135	0.08-0.12	140

Drilling

High speed steel drilling	Diameter (mm)	Grade	Feed (mm/rev)	Cutting speed (m/mm.)
HSS drill	1-3	HSS	0.03-0.09	8-15

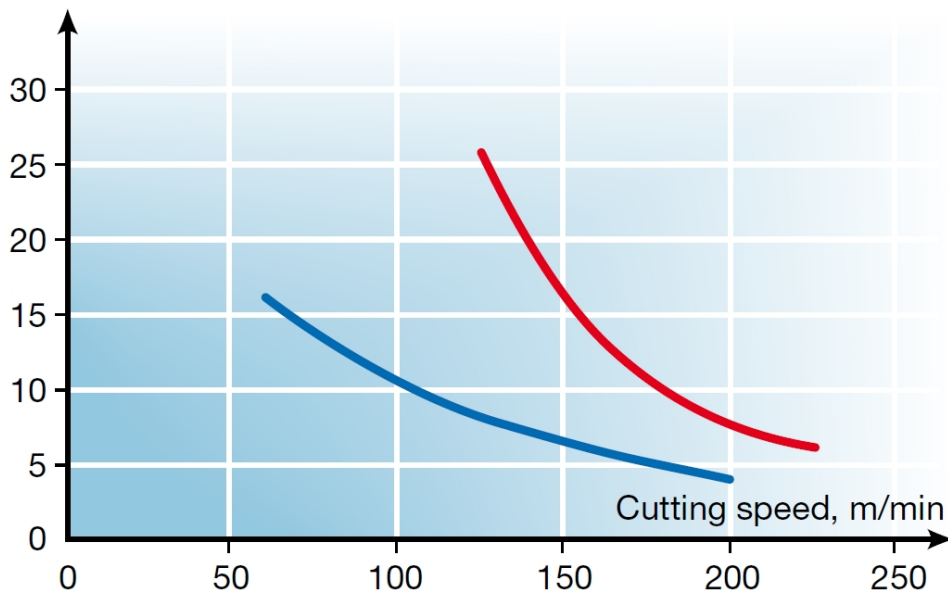
Solid carbide drilling	Diameter (mm)	Grade	Feed (mm/rev)	Cutting speed (m/mm.)
CoroDrill 840	3-12	GC1220	0.06-0.22	50

Short hole drilling	Diameter (mm)	Geometry	Grade peripheral/central	Feed (mm/rev)	Cutting speed (m/mm.)
CoroDrill 880	12-14	LM	GC4044/GC1044	0.04-0.09	140
CoroDrill 880	14-36	LM*	GC2044/GC1144	0.04-0.18	140
CoroDrill 880	36-63	LM	GC4024/GC1044	0.04-0.18	140

*MS for peripheral insert

Cutting performance comparison

Cutting time, min



■ Standard 329 ■ Sanmac 329

By applying the collective Sanmac knowledge in the upgrade of the standard Alloy 329, Sandvik R&D engineers have increased the machinability of the material to a new level. That, combined with a low spread in the manufacturing process, will provide major benefits to customers using Sanmac 329.

MICROSTRUCTURE

In the solution annealed and quenched condition Sanmac 329 has an austenitic-ferritic microstructure, which is free from grain-boundary carbides and intermetallic phases. The ferrite content is 55 – 75%.

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.