

SGS-75 technical documentation

The SGS-75 alloy is a «[stainless and self-lubricating](#)» alloy. Based on nickel (75%) and chromium (for corrosion resistance), it also includes bismuth and tin which give it its self-lubricating properties, make it particularly resistant to seizing and allow it to be used in contact with stainless steels, without lubrication, with reduced operating clearances.

Standard designation:

ASTM A494M grade CY5SnBiM

Chemical composition (in %) :

Ni	C	Cr	Mo	Si	Mn	Fe	Bi	Sn
Bal	0.05	11-14	2-3.5	0.05	1.5	2	3-5	3-5

All values are maximum unless a range is provided.

Properties

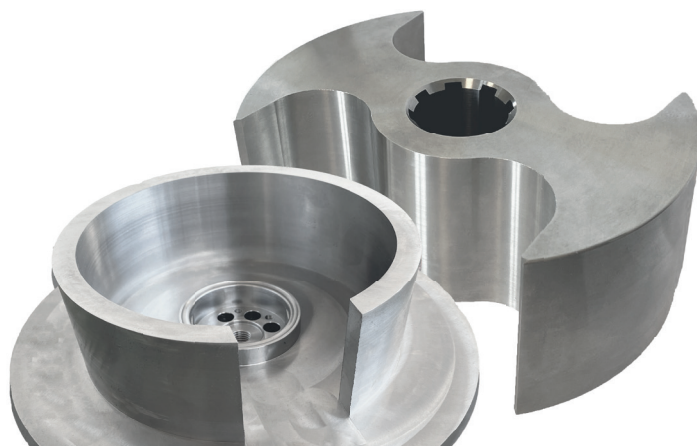
Corrosion resistance

Due to its chemical composition, SGS-75 alloy has a corrosion resistance comparable to AISI 304 and AISI 316 stainless steels, so it can easily replace them.

Corrosion rate in different media	SGS-75	AISI 304	AISI 316
Nitric acid HNO ₃ 100% at 20°C	< 0,05 mm/ year	< 0,05 mm/year	< 0,05 mm/year
Acetic acid CH ₃ COOH 50% at 60°C	from 0,05 to 0,5 mm/ year	< 0,05 mm/year	< 0,05 mm/year
Hydrazine N ₂ H ₄ 100% at 20°C	from 0,05 to 0,5 mm/ year	< 0,05 mm/year	< 0,05 mm/year with Mo < 0,5 %
Sea water at 20°C	< 0,05 mm/year	< 0,05 mm/year	< 0,05 mm/year

SGS-75 and food industry applications

Based on the inertia principle defined by the EC Regulation N°1935/2004, SGS-75 is suitable for many [food](#), [chemical](#) and [pharmaceutical](#) applications. SEVA can provide SGS-75 inertia results in different media, at different exposure times and temperatures. These values allow our customers to evaluate the food suitability of their equipment under their operating conditions and according to the applicable requirements.



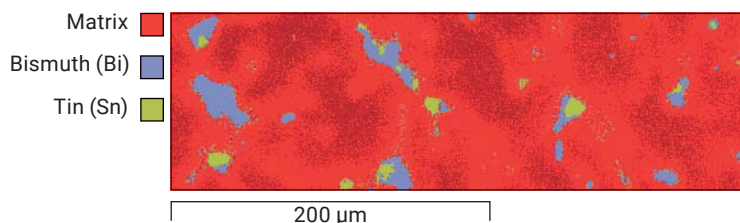
Tribological properties

Tribology is the science of contacts between two parts in relative motion. It is therefore concerned with friction, the wear it causes and lubrication.

The SGS-75 alloy is made of an austenitic matrix rich in nickel, chromium and molybdenum as well as a secondary phase rich in bismuth and tin which gives it particular tribological properties.

Homogeneous distribution of the bismuth-tin phase

So that tribological properties of SGS-75 be uniform, it is necessary to have a homogeneous distribution of the bismuth-tin phase in the parts produced.



Low coefficient of friction

The coefficients of friction with 316L stainless steel are significantly improved by the use of SGS-75:

- Coefficient of friction stainless steel 316L against stainless steel 316 L = 0.9.
- Coefficient of friction SGS-75 against stainless steel 316 L = 0.5.

Excellent seizure resistance

Seizure tests (performed according to ASTM G98, with several stainless steels and a maximum stress of 350 MPa) revealed no seizure with the SGS75.

	AISI 201	AISI 304	AISI 316	SAE 17-4 PH	20 Cr - 80 Ni
SGS-75	350+ MPa	350+ MPa	350+ MPa	350+ MPa	350+ MPa
AISI 201	137 MPa	14 MPa	14 MPa	14 MPa	N.A.
AISI 304	14 MPa	14 MPa	14 MPa	N.A.	N.A.
AISI 316	14 MPa	14 MPa	14 MPa	N.A.	N.A.
SAE 17-4 PH	14 MPa	N.A.	N.A.	14 MPa	N.A.

SGS-75 added value

SGS-75 alloy makes it possible to fight and significantly reduce all the causes of wear and degradation to which mechanisms operating in severe environments are subjected.

Resistance to corrosion and tribocorrosion

SGS-75 offers a resistance to «static» corrosion equivalent to that of AISI 316 L.

Thanks to the self-lubrication phenomenon, it allows to fight effectively against these surface aggressions and thus to increase in a way the resistance to tribocorrosion.

Self-lubrication

The self-lubrication provided by the SGS-75 greatly reduces adhesive wear and the risk of seizing.

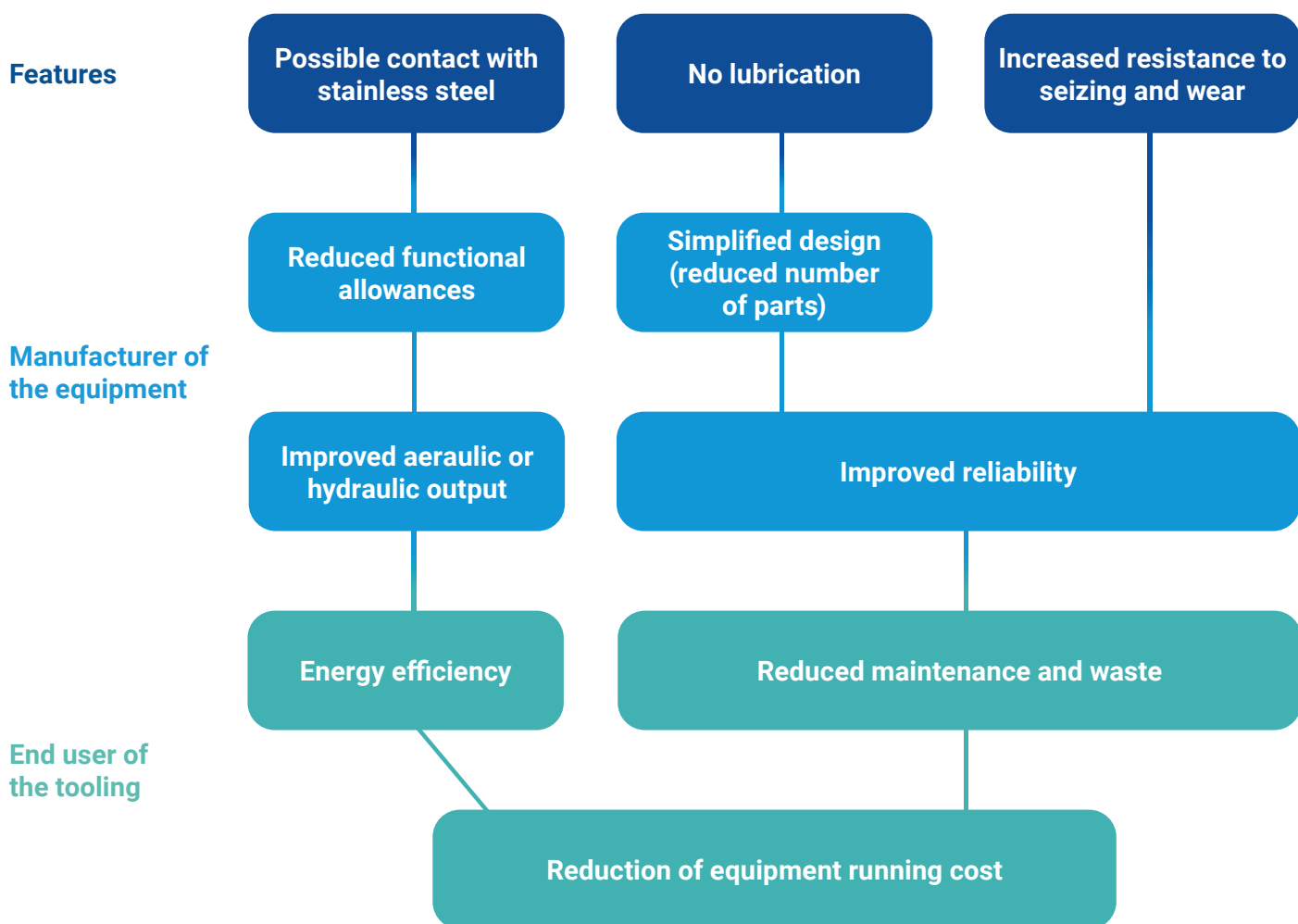
This reduces the coefficient of friction and therefore improves efficiency without the need for a lubricant.

Extended lifetime of the product

The SGS-75 features optimize performance and life in mechanical functions where there is or may be contact between parts that must resist to corrosion, without any external lubrication.

Towards a new business model

Added value of the SGS-75 for your equipment



The 3 main economic benefits



Cost reduction



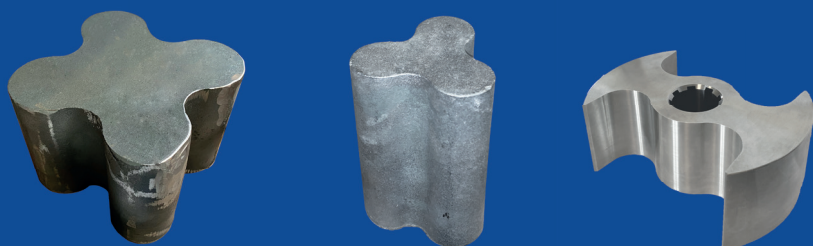
Increased profitability



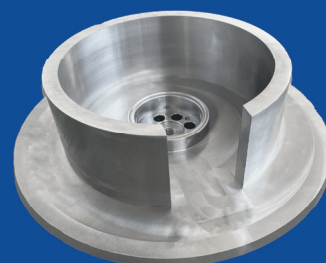
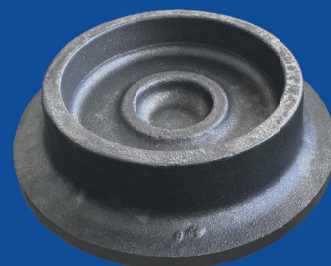
Value creation

Type of produced parts

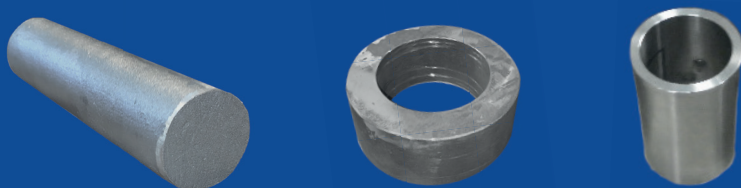
Lobe pump rotors and components
for the food industry



As-cast and machined
pump pistons



Range of standard round bars and bushings



Bearings and gear for handling and/or conveying systems
in hostile environments (nuclear applications)



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