

Superalloy **SGS-30-55**

The **nickel-based SGS-30-55** superalloy has got excellent high temperature properties: creep strength, oxidation and corrosion resistance. It is used for industries of material processing (hot working HF & SPF and glass industry), in aggressive environment, under high temperature and high mechanical stress.



Désignations

Désignation SEVA : **SGS-30-55**

Standard designation:

EN equivalence: **GX70NiCrW55-30-7**.



Chemical Analysis (en%)

The SGS-30-55 is a nickel-based superalloy elaborated following a typical process of SEVA.

Ni	Cr	W	C
Bal.	30	7	0,7



Mechanical properties

Hardness: 240 – 300 HB

Tensile test:

	300°C	600°C	750°C	900°C	1000°C	1050°C
Rm (MPa)	420	400	350	230	155	125
RP 0,2 (MPa)	320	300	200	180	120	100

Young's module at 20°C : E = 170 GPa

Tensile test at room temperature:

Rp0,2 (MPa)	Rm (MPa)	A (%)
340	520	2



Creep resistance

Creep resistance between 660°C and 1 050°C

	600°C	700°C	1000°C	1050°C
Contrainte (MPa)	250	150	35	35
Temps à rupture (h)	378	339	378	100
A (%)	3,6	6,3	5,0	-



Applications

Areas of use

- Areas of use
- Glass industry
- Aircraft industry
- Heat treatment furnace
- Cement works
- Petrochemical industry
- Miscellaneous toolings

Maximum temperature of use

1200°C

Types of parts produced

Glass toolings

Toolings for hot forming of sheets of titanium for the aircraft industry (Super-Plastic Forming SPF).



Standard structure

Austenitic, nickel-based matrix with a network of tungsten and chromium carbides.

**Physical Properties**

Density at 20 °C: 7,8

Approximate melting range: 1310 - 1370°C

Expansion coefficient α in $10^{-6} / ^\circ\text{C}$

Temperature (°C)	α ($10^{-6}/^\circ\text{C}$)
300	12,9
400	13,7
500	14,0
600	14,6
700	15,2
800	15,7

**Other properties**

Thermal conductivity λ in W.K-1.m-1
and thermal mass capacity Cp in J.g-1.°C-1
at various temperatures:

	Amb.	202°C	402°C	602°C	802°C
λ	5,91	12,19	15,43	21,22	24,91
Cp	-	0,489	0,509	0,603	0,672

	900°C	1002°C	1172°C
λ	22,65	28,74	36,43
Cp	-	0,706	0,834

**Production**

SEVA produces the **SGS-30-55 alloy** in an electric induction furnace, with an argon shroud.

Cast in a sand mold.

Heat treatment: **Mechanical reinforcement**

**Compatible processes**

	Compatibilité	Remarques
Machining	● ● ● ○ ○	Cutting speed: ~ 30 - 50 m/min
Polishing	● ● ● ○ ○	
Hot isostatic pressing (HIP)	● ● ● ● ●	
Forging	● ● ● ● ○	
Welding	● ● ○ ○ ○	Electrode or TIG

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