

Alloy **SGS-30-55**

Refractory superalloy with good creep, oxidation and corrosion resistance.



Marketing description

SGS-30-55 nickel-based superalloy has 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.

Designations

Designation SEVA : SGS-30-55

Standard designation:

EN Equivalent: GX70NiCrW55-30-7.

Chemical Analysis

Ni : Bal

Cr : 30

W : 7

C : 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
Rp0,2 (Mpa)	320	300	200	180	120	100

Young's modulus 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 600°C and 1 050°C

	600°C	700°C	1000°C	1050°C
Stress (MPa)	250	150	35	35
Time to rupture (h)	378	339	378	100
A (%)	3,6	6,3	5	-

Applications

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 the aircraft industry: Titanium sheets
- 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
600	14,6
700	15,2
800	15,7
900	16,1
1000	16,4

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
?	5,91	12,19	15,43	21,22	24,91
Cp		0,489	0,509	0,603	0,672

	900	1002°C	1172°C
?	22,65	28,74	1172°C
Cp		0,706	0,834

Production

SEVA produces the SGS-30-55 alloy in an electric induction furnace, under an argon gas protective atmosphere.

Cast in a sand mold.

Temperature (°C) α Heat treatment: Mechanical reinforcement.

Compatible processes

	Compatibility	Remarks
Machining	?????	Cutting speed recommended: ~ 30 to 50 m/min
Polishing	?????	

Hot isostatic pressing (HIP)	?????	
Forging	?????	
Welding	?????	Electrode or TIG.

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Alloy SGS-625

EN: NiCr22Mo9Nb

Excellent characteristics at high-temperature and good tenacity at very low temperature.

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Alloy SGS-R26-52

EN: G-NiCr28W (NF EN 10295)

Excellent creep resistance and good chemical properties.

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Alloy SGS-R25-20

EN: X15CrNiSi25-21 (NF EN 10095)

Excellent oxidation resistance due to its chromium content.

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