

Austenitic refractory steel SGS-37-18

The SGS-37-18 refractory alloy shows an excellent **oxidation resistance at high temperatures.**



Designations

SEVA Designation: **SGS-37-18**

Standard designation:

AFNOR **Z12NCS37.18**

EN **GX40NiCrSiNb38-19**

DIN **1.4849**



Creep resistance:

Temperature	925°C
Creep strength in MPa causing rupture for a duration of 1000h:	24 MPa
Stress causing an elongation of 1% after 1000 h:	19 MPa



Chemical analysis (in%):

C	Ni	Cr	Nb	Si	Mn	Fe
0.3-0.5	36-39	18-21	1.2-1.8	0.75-2.5	≤ 2	Bal.



Mechanical properties:

Hardness: 150-190 HB

Tensile tests at room temperature:

Rp0,2 (MPa)	Rm (MPa)	A (%)
230	430	6

Young's modulus at 20°C : E = 200 GPa

Hot tensile tests:

Temperature	870°C
Rp0,2 (in Mpa)	90-100
Rm (in Mpa)	145-160
A(%)	30-40



Applications

Areas of use:

- Aircraft industry
- Industries

Maximum temperature of use:

900°C-1000°C

Types of parts produced:

- Tools for shaping titanium sheets by Super-Plastic Forming (SPF) process
- Tools or industrial parts working at high temperatures



Standard structure

Austenitic matrix reinforced by precipitation of carbides.



Physical properties

Density at 20°C: 8.0 g/cm³

Approximate melting range: 1340-1390°C

Expansion coefficient α in 10⁻⁶ /°C :

Temperature (°C)	α (10 ⁻⁶ /°C)
300	15.23
400	15.68
500	16.1
600	16.53
700	16.94
800	17.38
850	17.58
900	17.86
950	18.07



Other properties

Magnetism : non-magnetic

Thermal conductivity λ W.m⁻¹.K⁻¹ at:

Temperature (°C)	λ W.m ⁻¹ .K ⁻¹
20	12

Heat capacity at 20°C : 500 J.kg⁻¹.K⁻¹



Production

SEVA produces the **SGS-37-18** alloy in an electric induction furnace under an argon gas protective atmosphere.

Cast in a sand mold.



Compatible processes

	Compatibility	Remarks
Machining	●●●●○	Cutting speed recommended: 60 to 90 m/min
Polishing	●●●●○	
Hot isostatic pressing (HIP)	●●●●○	
Forging	●●●●○	
Welding	●●○○○	

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