Alloy SGS-37-18

Austenitic refractory steel SGS-37-18

Marketing description

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

Chemical analysis

C : 0.3-0.5
Ni : 36-39
Cr : 18-21
Nb : 1.2-1.8
Si : 0.75-2.5
Mn : ≤ 2
Fe : 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 (°C)	870°C
Rp0,2 (en Mpa)	90-100
Rm (en Mpa)	145-160
A(%)	30-40

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

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)	? (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)	? 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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Image

Alloy SGS-R25-20

EN: X15CrNiSi25-21 (NF EN 10095)

Excellent oxidation resistance due to its chromium content.

23 May 2023
Image

Alloy SGS-R35-25

EN : X40NiCrNb35-25 (NF EN 10295)

S'emploie en procédé Hot Forming pour l'industrie aéronautique.

23 May 2023