



S.N. VITA Ltd

21 Ha'Mesila street, Neshar 3688521, Israel
Tel: +972-73-247-1052, Fax: +972-77-444-8532,
e-mail: snvita@013net.net, web-site: www.skynet-vita.com

SUPERALLOY SN254098 SPECIFICATIONS

1. Overview

SN254098 is a kind of diffusion strengthening alloy with high alloying and hot-strength, and the working temperature of the alloy can reach as high as 1000°C. It can be used as materials for turbine guide vanes and force enhancing combustion chambers. It has good anti-oxidation ability, cold-fatigue property, hot-fatigue property and weldability up to 900°C

1.1. Material Grade

SN254098

1.2. Similar grades

XH50MBKTIOP-ИД(ЭП99-ИД) (Russia)

1.3. Technical Standard material

GB/T 14992-2005 - Classification and designation for superalloys and high temp. intermetallic materials

1.4. Chemical composition

C	Cr	Ni	Co	W	Mo	Al	Ti	Fe	Nb	B	Ce	No more than				
												Si	Mn	P	S	Cu
≤0.10	17.5~19.5	Rest	5.0~8.0	5.5~7.0	3.5~5.0	2.5~3.0	1.0~1.5	≤3.0	≤1.5	≤0.005	≤0.02	0.3	0.3	0.015	0.015	0.07

1.5. Heat Treatment

State	Solution treatment	Aging
Sheet	1120°C~1160°C, air-cooled	800°C~820°C, 8h-10h, air-cooled

1.6. Product Form

These alloys available in sheet.

1.7. Applications

Used as materials for turbine guide vanes and force enhancing combustion chambers

2. Physical Properties

2.1. Thermal Performance

2.1.1. Thermal Conductivity - $\lambda = 10.1 \text{ W}/(\text{m}\cdot^\circ\text{C})$

2.1.2. Coefficient of linear expansion - $\alpha = 11.47 \cdot 10^{-6} \cdot ^\circ\text{C}^{-1}$

2.2. Density - $\rho = 8.44 \text{ g}/\text{cm}^3$



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3. Mechanical Properties

3.1. Performance of technical standards

State	Tensile Properties						high temperature persistent		
	$\theta/^\circ\text{C}$	σ_b/MPa	$\sigma_{0.2}/\text{MPa}$	$\delta_5/\%$	$\varphi/\%$	Impact	$\theta/^\circ\text{C}$	σ/MPa	Time [h]
Sheet	20	1230	785	20	22	115J	800	314	65
	900	470	431	14	25				

3.2. Durability and creep properties

3.2.1. Durability properties

Material	$\theta/^\circ\text{C}$	σ/MPa	Time [hours]
Sheet	700	100	549

3.2.2. High temperature creep properties

Material	$\theta/^\circ\text{C}$	σ/MPa	Time [hours]	$\delta_5/\%$
Sheet	900	229	100	0.2

3.2.3. Fatigue performance

Material	$\theta/^\circ\text{C}$	σ/MPa	N [no. of times]
Sheet	800	323	>10E7

3.3. Elastic properties

3.3.1. Modulus of elasticity

Dynamic [E_D] modulus of elasticity at different temperatures.

$^\circ\text{C}$	20	600
E_D [GPA]	224	153