



S.N. VITA Ltd

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SUPERALLOY SN254033 SPECIFICATIONS

1. Overview

SN254033 alloy is nickel - chromium for matrix, adding aluminum, titanium formation of gamma phase dispersion strengthened alloy, in 500-700 °C has enough high temperature strength, in 900 °C below with good make oxidizing. This alloy cold, hot work performance is good, the main supply hot rolled steel bar and plate stock, used in engine rotor parts.

1.1. Material Grade

SN254033

1.2. Similar grades

ХН77ТЮРУ-ВД, ЭИ437БУ-ВД, ХН77ТЮР-ВД, ЭИ437Б-ВД (Russia)

1.3. Technical Standard material

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

GB/T 14993-2008 - Hot-rolled superalloy bars for rotating parts

GB/T 14994-2008 - Superalloy cold drawn bars

GB/T 14996-2010 - Cold-rolled heat-resisting superalloy sheets

GB/T 14997-1994 - Forged heat-resisting superalloy disks

1.4. Chemical composition

C	Cr	Ni	Al	Ti	Fe	B	Ce	No more than			
								Mn	Si	P	S
0.03~0.08	19.0~22.0	Rest	0.6~1.0	2.4~2.8	≤4.0	≤0.01	≤0.02	0.40	0.65	0.015	0.007

1.5. Heat Treatment

State	Solution treatment	Aging
Cold drawn bars	1080°C, 8h, air-cooled	700°C, 16h, air-cooled
Cold-rolled sheets	970°C~990°C, air-cooled	

1.6. Product Form

These alloys available in bar, sheet & disks.

1.7. Applications

Mainly supplied in hot rolled steel bar and plate and used in engine rotor parts.



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2. Physical Properties

2.1. Thermal Performance

2.1.1. Thermal Conductivity

°C	100	200	300	400	500	600	700	800	900
λ [W/(m·°C)]	11.3	12.97	14.64	16.32	17.99	20.08	22.59	25.11	27.62

2.1.2. Coefficient of linear expansion

°C	20~200
α [$10^{-6} \cdot ^\circ\text{C}^{-1}$]	13.15

2.2. Density – $\rho = 8.2 \text{ g/cm}^3$

2.3. Electrical properties

2.3.1. Electrical Resistivity – $\rho = 1.24 [10^{-6} \Omega \cdot \text{m}]$

2.4. Magnetic – Non magnetic alloy

3. Mechanical Properties

3.1. Performance of technical standards

Standard	State	Tensile Properties						Hardness [HBW]	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]
GB/T 14996	Cold-rolled sheet	20	885	---	13		---				
		700	685	---	13	20	---				
GB/T 14994	Cold drawn bar	700	685	---	15	20	75J		700	430	60
										410	80
GB/T 14993	Hot-rolled bar	700	685	---	15	20	---	255~321	700	430	60
										410	80
GB/T 14997	Forged disk	20	882	588	13	16	294 KJ/m ²	3.4~3.8 HB	750	294	100



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3.2. Durability and creep properties

3.2.1. Durability properties

Material	$\theta/^\circ\text{C}$	σ/MPa	Time [hours]	$\delta_5/\%$
Bar	700	432	163	6

3.2.2. High temperature creep properties

Material	$\theta/^\circ\text{C}$	σ/MPa	Time [hours]	$\delta_5/\%$
Bar	700	295	100	0.2

3.2.3. Fatigue performance

Material	$\theta/^\circ\text{C}$	σ/MPa	N [no. of times]
Bar	750	412	$>10E7$