

Mechanical Properties

Grade	Test Condition	Yield Strength N/mm ² (Min)	Tensile Strength N/mm ² (Min)	Elongation %(min)	Hardness HRC
EN 52	Annealed				35 Max
EN 52	Hardened & tempered	700	900	14	As per customer specifications
21-4N	Solution Annealed, Ageing	660	882	8	30-40

Supply Conditions

Dimensional Tolerance				
	As Rolled	As Drawn	As Peeled	Centreless Ground
Size Range	Coils - 5.5mm to 15mm Rounds - 15mm to 30mm RCS - 75mm, 80mm & 100mm	5mm to 30mm	5mm to 30mm	5mm to 30mm
Dimension Tolerance	As per IS 3739	5mm to 10mm h11, 10 to 30mm h10,	h11	h9, h11, +0.05/-0, ± 0.05, +0.20/-0 or as per requirement
Out of Roundness	As per IS 3739	0.05mm	1/2 dia tol	1/2 dia tol
Straightness	3.00 mm / mtr.	1mm / mtr	1 mm/mtr	1 mm / mtr
Length	4.0 mtrs (Length below 4 mtr can be supplied by offline cutting)	3 to 4 mtr	3 to 4 mtr	3 to 4mtr

ENGINE VALVE STEEL

FOR INTAKE AND EXHAUST VALVES OF
INTERNAL COMBUSTION ENGINES



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**SUN FLAG
STEEL**

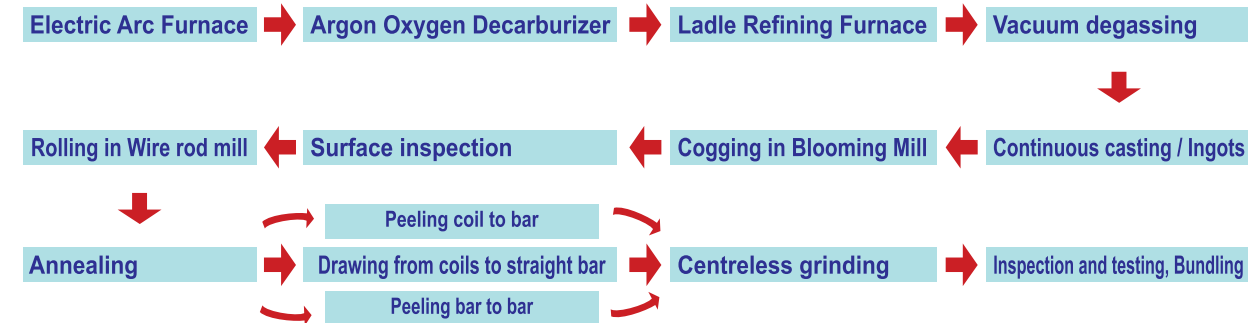
BIS Approved
NABL Accredited Chem & Mech Labs.
ISO 9001 & IATF 16949 Certified by UL DQS
ISO 14001 & OHSAS 18001 Certified by TUV Nord
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Engine Valve Steel



Sunflag Steel is a leader in production of heat resistant steel used for manufacture of Intake and Exhaust valves for Internal Combustion Engines.

Process route for Manufacturing of Valve Steel



Inspection and Testing at Sophisticated Lab

- Inspection and Testing for Surface Quality i,e MPI /ECT/Zyglo
- Internal Soundness Ultrasonic Test
- Dimension, Length
- Hardness, Microstructure, Inclusion, Grain Size



Grades / Standards

EN 10090	SAE	DIN (W No.)	BS	JIS	IS
X45CrSi93	HNV3	1.4718	EN 52	SUH1	X45Cr9Si3
X40CrSiMo10-2	HNV1	1.4731		SUH3	X40Cr11Si2Mo10
X50CrSi 82				SUH-11	X50Cr8Si2
X53CrMnNiN21-9	EV8	1.4871	21-4N	SUH35	X53CrMnNiN219
X55CrMnNiN20-8	EV12	1.4875	21-2N		X55CrMnNiN208
X50CrMnNiNbN219	VA63	1.4882	21-43		X50CrMnNiNbN219
	HEV3		Inconel 751		NiCr15Fe7TiAl

Chemical Composition

Elements	Grades		
	X45CrSi 9-3 (EN 52)	21-4 N	Inconel 751
%C	0.40-0.50	0.48-0.58	0.10 max
%Mn	0.6 max	8.0-10.0	1.0 max
%P	0.04 max	0.05 max	
%S	0.030 max	0.03 max	0.015 max
%Si	2.7-3.3	0.25 max	0.50 max
%Cu	--	--	0.50 max
%Cr	8.0-10.0	20.0-22.0	14.0-17.0
%Ni	0.50 max	3.25-4.50	Balance
%Mo	--	--	--
%V	--	--	--
%N	--	0.35-0.50	--
%Ti	--	--	2.0-2.6
%Al	--	--	0.9-1.5
Fe	--	--	5.0-9.0
%Cb & Ta	--	--	0.70-1.20