

## Steel for Power Sector

Creep Resistance and High Temperature Steel, Turbine Blade Steel, Bolting Steel- Shroud Segment And Non Magnetic Steel for Steam/Gas Turbine.

Non Magnetic Steel

{A} Non Magnetic Steel for Generators

Grade	Mechanical Properties				Supply Condition	Sections	
DIN SEW390 (1.3805) X35Mn18* X120Mn12	<b>Tensile Strength</b> (N/mm2)	<b>0.2% Proof Stress</b> (N/mm2)	<b>% Elongation</b> >22	<b>% Reduction in Area</b> >22	<b>Impact Strength (J)</b> >55	<b>Heat-Treated Solution-Annealed &amp; in other Heat-Treated conditions can be supplied as per customer's requirement.</b>	<b>Flats</b> 40x25, 60x20, 30x06mm The obve sizes are already developed & material can be rolled in other sections on request.
	650-900	>240	<40	<40	<150		
	800-1100	>350	<40	<40	<150		

{A2} Austenetic Alloy Steel Bar for Tension Bolt for Power Turbines

Grade	Mechanical Properties				Supply Condition	Sections	
DIN SEW390 (1.3805) X40Mn CrN19K	<b>Tensile Strength</b> (N/mm2)	<b>0.2% Proof Stress</b> (N/mm2)	<b>%Elon- gation</b> >20	<b>%Red- uction in Area</b> >40	<b>Impact Strength (J)</b> >90	<b>Solution-Annealed Material is supplied in cold drawn condition.</b>	<b>Dia 16, 26, 30, 36, 40mm</b> The above size are already developed & material can be rolled in other sections On request.
	850-1050	>500	>20	>40	>90		

{A3} Steel for Retaining Ring & Spring Forging

Grade	Mechanical Properties	Supply Condition	Sections
HW 19372 X5CrMn1818	Proof Stress : 500N/MM2 Min. Elongation : 39% Mini. Reduction in area : 62% Mini.	Solution Annealed	As per Drg. No.440280-39009 R.00 & Drg. No. 31350400007

Blade Steel

{B1} Moving and Stationary Guides Blades for Steam Turbine

Grade	Mechanical Properties				Supply Condition	Sections
DIN (1.4021) X20Cr13	<b>Tensile Strength</b> (N/mm2)	<b>0.2% Proof Stress</b> (N/mm2)	<b>%Elon- gation</b> >15	<b>%Reduction in Area</b> >50	<b>Hardened &amp; Tempered</b>	<b>Flats</b> 42x24, 34x22, 34x19, 38x25mm <b>Dia 70,90mm</b> The above sizes are already developed & material can be rolled in other sections on request.
	800-950	>600	>15	>50		
	<b>Impact Strength (J)</b> >20	<b>Hardness</b> >280BHN				

{B2} Moving and Stationary Guides Blades for Steam Turbine suitable at Working Temp 400-550 °C

Grade	Mechanical Properties					Supply Condition	Sections
DIN (1.4923) X22Cr MoV121	<b>Tensile Strength</b>	<b>0.2% Proof Stress</b>	<b>%Elongation</b>	<b>%Reduction in Area</b>	<b>Impact Strength (J)</b>	Hardened & Tempered	<b>Flats</b> 42x24, 34x22, 34x19, 50x26mm <b>Dia</b> 70,90mm The above sizes are already developed & material can be rolled in other sections on request.
	800-900 (N/mm <sup>2</sup> )	>600 (N/mm <sup>2</sup> )	>14	>40	>27		
	<b>Hardness</b>						
	>280BHN						

{B3} 310 N/MM2, 0.2% RP Low Carbon Rustless Steel Bar Turbine Guides Blades and Details

Grade	Mechanical Properties	Supply Condition	Sections
BP 10793	Proof Stress : 310N/MM2 Min. Tensile Strength : 495-620 N/MM2 Elongation : 22% Mini. Reduction in area : 55% Mini.	Hardened & Tempered	Rounds & Flats

{B4} Stainless Steel Bar (Martensitic) for general Engineering Purposes involving Stresses under Corrosive Conditions

Grade	Mechanical Properties	Supply Condition	Sections
IS : 6603-1972 GR.15CR16NI2	Proof Stress : 640N/MM2 Min. Tensile Strength : 830-1030N/MM2 Elongation : 10% Mini. Hardness : 248-302 (HB)	Hardened & Tempered	Rounds

{B4} Steel for Steam Turbine Spacer Bands and Dia Phrame Blades

Grade	Mechanical Properties	Supply Condition	Sections
BP 10688	Proof Stress : 310N/MM2 Min. Tensile Strength : 460N/MM2 Mini. Elongation : 20% Mini. Hardness : 131 HB Mini.	Normalised & Tempered	Flats

Creep Resistant Steel

{C1} Creep Resistant Steel for making Steam Turbine Bolts, Nuts, Studs, Spindles, Bushing Components

Operating at Temperature Range 480-540 °C

Grade	Mechanical Properties					Supply Condition	Sections
21CrMoV57 1%Cr3/4Mo 1/4V	<b>Tensile Strength</b>	<b>0.2% Proof Stress</b>	<b>%Elongation</b>	<b>%Reduction in Area</b>	<b>Impact Strength (J)</b>	Hardened & Tempered and in other Heat-Treated conditions can be supplied as per customer's request.	<b>Dia</b> 63, 70, 75, 90mm <b>RCS</b> 75, 90mm
	700-850 (N/mm <sup>2</sup> )	>550 (N/mm <sup>2</sup> )	>16	>60Longitudinal >35Transverse	>63Longitudinal >20Transverse		

{C2} Creep Resistant Steel for making Bolts, Nuts, Studs and other Components of Steam Power Plant to Operate at Temperature Range 540-565 °C

Grade	Mechanical Properties	Supply Condition	Sections
1 1/4Cr1Mo 3/4VTiB	<b>Tensile Strength</b> >735 (N/mm2) <b>0.2% Proof Stress</b> 640-785 (N/mm2) <b>%Elongation</b> >15 <b>%Reduction in Area</b> >45 <b>Impact Strength (J)</b> >40	Hardened & Tempered and in other Heat-Treated conditions can be supplied as per customer's request.	<b>Dia</b> 63, 70, 75, 110, 125mm <b>RCS</b> 70, 90mm

{C3} Creep Resistant Steel for Boiler Components

Grade	Mechanical Properties	Supply Condition	Sections
SA 182 F11	Yield Strength : 205N/MM2 Min. Elongation : 20% Mini. Reduction in Area : 45% Mini. Tensile Strength : 415N/MM2 Min.	Normalised & Tempered	Rounds

Grade	Mechanical Properties	Supply Condition	Sections
SA 182 F12	Yield Strength : 205N/MM2 Min. Elongation : 20% Mini. Reduction in Area : 45% Mini. Tensile Strength : 415N/MM2 Min.	Normalised & Tempered	Rounds

Grade	Mechanical Properties	Supply Condition	Sections
SA 182 F22	Yield Strength : 205N/MM2 Min. Elongation : 20% Mini. Reduction in Area : 35% Mini. Tensile Strength : 415N/MM2 Min.	Normalised & Tempered	Rounds

Steel For Pressure Retaining Parts

{D1} Steel for Valve Stems and Other Components Operating High Level of Pressure and Temperatures

Grade	Mechanical Properties	Supply Condition	Sections
X 19CRM OVNBN111	Yield Strength : 784N/MM2 Mini. Tensile Strength : 902-1049N/MM2 Elongation : 10% Mini. Reduction in Area : 40% Mini.	Hardened & Tempered	Rounds

{D2} Steel for General Corrosion Resistance and High Temperature Service

Grade	Mechanical Properties	Supply Condition	Sections
TP 304	Yield Strength : 205N/MM2 Mini. Tensile Strength : 515N/MM2 Elongation : 40% Mini. Reduction in Area : 50% Mini.	Solution Annealed	Rounds & Flats

{D3} Steel for Manufacture of Labrinth Sealing Rings of Compressures

Grade	Mechanical Properties	Supply Condition	Sections
TP 316L	Yield Strength : 170N/MM2 Mini. Tensile Strength : 485N/MM2	Solution Annealed	Rounds & Flats

Elongation : 40% Mini.  
Reduction in Area : 50% Mini.

{D4} Steel for Gas Turbines Nozzles Boroscope Plugs and Shroud Segments

Grade	Mechanical Properties	Supply Condition	Sections
TP 310	Yield Strength : 205N/MM2 Mini. Tensile Strength : 515N/MM2 Reduction in Area : 50% Mini. Elongation : 10% Mini.	Solution Annealed	Rounds & Flats

Steel For Hydro Turbine Applications

{E1} A Precipitation Hardening Martensitic Stainless Steel for Shafts, Blades, Fans, Pump Parts, Valves, Fasteners and Transducers under Water Applicatins.

Grade	Mechanical Properties	Supply Condition	Sections
FV 520B	Proof Stress: 800N/MM2 Mini. Tensile Strength : 925-1080N/MM2 Elongation : 15% Mini. Hardness : 276 to 321 BHN	Solution Annealed	Flats & Rounds

{E2} NI-CR-MO Steel Bar for Heavy Duty Railway Motor Shafts

Grade	Mechanical Properties	Supply Condition	Sections
BP 10590 IS:5517- 1993 GR.31NI10 CRM06	Proof Stress: 800N/MM2 Mini. Tensile Strength : 1000-1150N/MM2 Elongation : 12% Mini. Hardness : 293-341 (HB)	Hardened & Tempered	Rounds

Supply Conditions

- As Rolled
- Heat Treated (Hardened & Tempered, spherodised annealed etc)
- Cold Drawn
- Peeled / Ground

Testing

UT/MPI/DP Tested