



संवाद
Sanwaad

Online Workshop

for **Development of Local Suppliers**
for **sourcing of engineering items & raw materials**

8th January 2021, 10.00 AM

#AatmaNirbharBharat



#VocalforLocal

Fifth Workshop – **Castings & Forgings**

Hosted by Heavy Electricals Equipment Plant (HEEP), BHEL , Hardwar

HEEP, Hardwar

HP & IP ROTOR

Annual Procurement (Approx.):

- 4 Nos HP Rotor (6 Crore / year) and
- 4 Nos IP Rotor (10 Crore /Year)

Technical Requirement:

Material Grade: X12CrMoWVNbN10-1-1 (1.4906)

C	Si	Mn	P	S	Cr	Mo
0.11 - 0.13	≤ 0.12	0.40 - 0.50	≤ 0.012	≤ 0.005	10.2 - 10.6	1.00 - 1.10

Ni	W	V	Al	N	Nb
0.70 - 0.80	0.95 - 1.05	0.15 - 0.25	≤ 0.010	0.045 - 0.060	0.04 - 0.06

Melting & Refining Requirement: Vacuum Degassed Steel or ESR steel

Heat Treatment: In vertical condition (Hardening at 1070 – 1100°C with / 2 stage tempering)

HP & IP ROTOR

- **Mechanical Property:** 0.2%PS 700-800 MPa ,UTS1000MPa max, %E 13min, %RA 40min, Impact 30Jmin . Tangential / Radial Sample from surface and axial core extracted from center of rotor.
- **NDT requirement:** 100% UT. MPI of axial bore and rotor transition. Residual Stress Measurement as per ASTM E837 or Ring Core Method of Siemens (60Mpa max permitted)
- **Other Requirements:** Axial Core trepanning (dia 130 X length 900-1400mm); Heat Stability testing at 670°C; Creep Rupture Test requirement for qualification of vendor (600C , 222MPa , 1000hrs)
- **Rotor size :** (Max dia x Barrel length x Total length x weight)
- HP Rotor – Max Dia 800mm X 2765mm X 5475mm X 15.9 Ton; IP Rotor - Max Dia 1110mmX 3545mmX 5907mm X 27.5 Ton

LP ROTOR

Annual Procurement (Approx.): 8 Nos (28 Crore / year)

Technical Requirement:

Material Grade: 26NiCrMoV11-5

C: 0.30 max	Si: 0.07 max	Mn: 0.15-0.40	P: 0.007 max
S: 0.007 max	Cr: 1.50 – 2.00	Mo: 0.30 – 0.55	Ni: 2.80-3.30
V: 0.07- 0.15	Al total: 0.010 max	Sn: 0.015max	Sb:0.0015max
As: 0.020 max	Cu: 0.15 max		

Melting & Refining Requirement: Vacuum Degassed Steel

LP ROTOR

- **Mechanical Property:** 0.2%YS 760-860 Mpa, UTS 860-1040MPa , %E 15 min, %RA 45min, Impact 100Jmin, FATT <-10C , Tangential / Radial Sample from surface and axial core extracted from center of rotor
- **Dimension & Weight (Barrel Diameter X Barrel Length X Total Length X Weight):**
(Dia 1540 mm X 3365 mm X 6707) mm X 53.67Ton
- **NDT requirement:** 100% UT. MPI of axial bore and rotor transition. Residual Stress Measurement as per ASTM E837 or Ring Core Method of Siemens (60Mpa max)
- **Other Technical Requirement:** Axial core trepanning facility (Dimension of axial core: dia130mm; Length: ≈1840mm)

TG ROTOR

Annual Procurement (Approx.): 5Nos (10 Crore / year)

Technical Requirement:

Material Grade: 26NiCrMoV14-5 (1.6948)

C: 0.30 max	Si: 0.07 max	Mn: 0.15-0.40	P: 0.007 max
S: 0.007 max	Cr: 1.50 – 2.00	Mo: 0.30 – 0.55	Ni: 2.80-3.30
V: 0.07- 0.15	Al total: 0.010 max	Sn: 0.015max	Sb:0.0015max
As: 0.020 max	Cu: 0.15 max		

Melting & Refining Requirement: Vacuum Degassed Steel

TG ROTOR

Mechanical Property:

- Tangential / Radial Sample from surface and axial core extracted from center of rotor
- 0.2% YS: 760-860MPa, UTS: 860 -1040Mpa, %Elon: 15min, % RA: 45min, Impact: 100J min, FATT: -10C max .
- **Dimension & Weight (Barrel Diameter X Barrel Length X Total Length X Weight):** (Dia1155) mm / (6690) mm X (13135) mm X (70.7) Ton
- **NDT requirement:** 100% UT. MPI of axial bore and rotor transition. Residual Stress Measurement as per ASTM E837 or Ring Core Method of Siemens (60Mpa max)
- **Other Technical Requirement:** Axial core trepanning facility (Dimension of axial core: dia230mm; Length: ≈2300mm)

Nodular Casting: IP Outer Casing & Guide Blade Carrier

Annual Procurement (Approx.):

- 4 Nos IP Outer Casing (10 Crore / year) &
- 4 Nos Guide Blade Carrier (3.2Crore/year)

Technical Requirement:

Material Grade: GGG 40GGG, EN-GJS-400-18-RT(Nodular Cast Iron)

Mechanical Property:

0.2%YS >250MPa , UTS>400 , %E >12 , Impact 12 J

Nodular Casting: IP Outer Casing & Guide Blade Carrier

- **Testing Requirements:** Mechanical, NDT (UT & MPI), Microstructure – for nodularity , Max pearlite 10%.
- **Manufacturing Facility:** Handling, melting, and heat treatment facilities
- **Weight Range of Casing:**
 - IP Outer Casing - 29.8 / 39.2 Ton (Upper / Lower half).
 - Guide Blade Carrier: Upper Half: 5540kg, Lower Half: 5640kg

Retaining Ring/Winding Support Ring Forging

Annual Procurement (Approx.): 4 Nos (1.5 Crore / year)

Technical Requirement:

Material Grade: X8CrMnN1818K (Cold Expanded)

Electro – slag re-melted steel / heat analysis:

C	Si	Mn	P	S	Cr	Ni	N
≤ 0.10	≤ 0.80	17.5 – 20.0	≤ 0.050	≤ 0.015	17.5 – 20.0	≤ 1.00	≥ 0.50

Al	Ti	V	B
≤ 0.025	≤ 0.10	≤ 0.15	≤ 0.001

Melting & Refining Requirement: ESR steel

NDT requirement: 100% UT.

Retaining Ring/Winding Support Ring Forging

- **Manufacturing Process:** Hot forging for ring and further cold working using mandrel process or hydraulic process with working temperature below 300°C. Strain rate <2.5/minute. Explosive forming not permitted. Stabilization temperature at 340 – 360 °C with controlled heating and cooling
- **Winding Support Ring - ID 520mm ,OD 573 mm , Height 170/190mm , weight 54/61Kg**
- **Properties - At 100C , 0.2%YS 800 – 950 , UTS 840min, %E 29min , %RA 60 min , Impact 100 J min.**
- **Retaining Ring ID1066 mm ,OD1207 mm, Height 630mm , 1245 kg**
- **Properties At 100C , 0.2%YS 1050-1200 , UTS 1050min, %E 19min , %RA 58 min , Impact 50 J min.**

Intermediate Ring Forging

Technical Requirement:

Material Grade: CuAl11Ni6Fe5, F74 (2.0978.08).

Cu	Balance	Ni	5.0 – 7.5
Al	10.5 – 12.5	Pb	≤ 0.05
Fe	4.8 – 7.3	Zn	≤ 0.5
Mn	≤ 1.5	Other	≤ 0.3

Mechanical Properties:

Thickness mm	0.2 % Yield Strength N/mm ²	Tensile Strength N/mm ²	Elongation (l ₀ = 5d) (%)	Hardness HB2.5/62.5
≤ 80	≥ 420	≥ 740	≥ 5	≥ 205
> 80	≥ 410	≥ 740	≥ 4	≥ 205

Major Dimension:

Intermediate Ring Forging – ID 540mm , OD 695mm, Height 390mm, Weight: 484kg.

Forging for Half Ring - ID 410mm, OD 560mm, Height 55mm; Weight: 25kg

HPBP, Trichy

Castings & Forgings – Alloy Steel Finned Elbow

BHEL					HSN Code	Whether required by other clients
Classification	Application	Specification	Unit	Requirement p.a. (Rs Cr)		
Forged Finned Elbow of Grade SA182F12Cl2	Super Critical Boiler Fittings	TDC:0:404 Rev-19	HPBP Trichy	0.5	7307	M/s GE India

Material Grade: SA182F12Cl2

Size : i) OD 41.3x7.65 THK /OD 33.4x6.1 THK,
ii) OD 33.4x5.59 THK / OD 38.1x8.13 THK

Single Finned Elbow



Triple Finned Elbow



Castings & Forgings – Grade91 Hemispherical Dished End

BHEL					HSN Code	Whether required by other clients
Classification	Application	Specification	Unit	Requirement p.a. (Rs Cr)		
Hemispherical Dished End of Grade SA234WP91	Super Critical Boiler Fittings	TDC:0:423 Rev-09	HPBP Trichy	0.5	7307	M/s GE India

Material Grade: SA234WP91

**Size : Dia 610 mm; 80 mm Thk - 8 Nos.
Dia 711 mm; 90 mm Thk – 4 Nos.**



Castings & Forgings – Grade92 Equal Tee

BHEL					HSN Code	Whether required by other clients
Classification	Application	Specification	Unit	Requirement p.a. (Rs Cr)		
Equal Tee Grade - SA182F92	Super Critical Boiler Fittings	TDC:0:423 Rev-09	HPBP Trichy	0.5	7307	M/s GE India

Material Grade: SA182F92

Size : Dia 508 mm; 120 mm Thk.

Qty : 2 Nos.

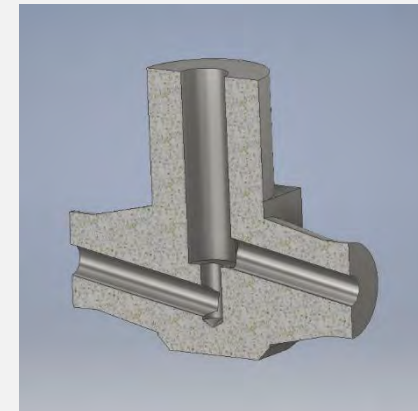
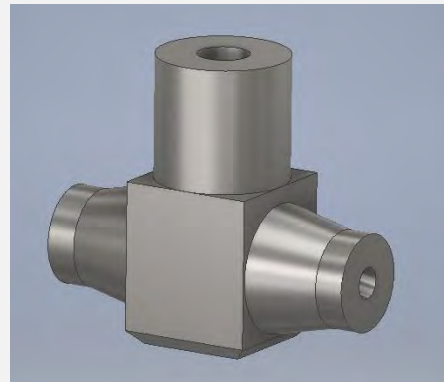
Total Wt : 4.5 MT



Castings & Forgings – F92 forgings

BHEL					HSN Code	Whether required by other clients
Classification	Application	Specification	Unit	Requirement p.a. (Rs Cr)		
Proof Machined Forgings of F92 material grade with individual weight of 200 kg to 11 MT	Valves	TDC:0:404 Rev 19	HPBP Trichy	3	8481	L&T and other valve manufacturers

Material Specification: ASME 2015



Castings & Forgings – Stainless Steel forgings

BHEL					HSN Code	Whether required by other clients
Classification	Application	Specification	Unit	Requirement p.a. (Rs Cr)		
Special Stainless Steel Forgings of specification X19CRMONBVN11-1	High Pressure Bypass Valves for boiler application	TDC:0:408 Rev 03	HPBP Trichy	1	8481	CCI, Bomafa

Material Grade: X19 Cr Mo NB VN 11-1



Material Projection for next 5 Years

Unit	Description of item	Projected Procurement Value (Rs Cr.)				
		2020-21	2021-22	2022-23	2023-24	2024-25
HPBP, Trichy	Equal Tee of Grade SA182F92	0.50	1.50	2.00	1.50	1.50
HPBP, Trichy	Hemi spherical dished ends of Grade SA234WP91	0.50	1.50	2.00	1.50	1.50
HPBP, Trichy	Forged Finned Elbows of Grade SA182F12Cl2	0.50	1.50	2.00	1.50	1.50
HPBP, Trichy	Special Stainless Steel Forgings of specification X19CRMONBVN11-1	0.18	0.18	0.18	0.18	0.18
HPBP, Trichy	Proof Machined Forgings of F92 material grade with individual weight of 200 kg to 11 MT	3.52	6.00	6.00	3.50	3.50

HPEP, Hyderabad

HP ROTOR FORGING

Technical Requirement:

Material Grade: 30 Cr Mo Ni V 511, (1.6946)

Element		C	Si	Mn	Cr	Mo	Ni	V	P	S	Al (Total)
VCD Process	Min.	0.270.3	-	0.30	1.10	1.00	0.50	0.25	-	-	-
	Max.	1	0.10	0.80	2.00	1.20	1.50	0.35	0.007	0.007	0.008
ESR process	Min	0.270.3	-	0.30	1.10	1.00	0.50	0.25	-	-	-
	Max	1	0.20	0.80	2.00	1.20	1.50	0.35	0.007	0.005	0.010

Melting & Refining Requirement: Vacuum Degassed Steel or ESR steel

Heat Treatment: In vertical condition (Hardening at 940 – 960°C)

Mechanical Property: 0.2%PS 550-700 MPa ,UTS 850MPa max, %E 15min, %RA 40min, Impact 24Jmin .

Tangential / Radial Sample from surface and axial core extracted from center of rotor.

HP ROTOR FORGING

- **NDT requirement:** 100% UT. MPI of axial bore and rotor transition. Residual Stress Measurement as per ASTM E837 or Ring Core Method of Siemens (60Mpa max permitted)
- **Other Requirements:** Axial Core trepanning (dia 130 X length 900-1400mm); Heat Stability testing at 670°C; Creep Rupture Test requirement for qualification of vendor (600C , 222MPa , 1000hrs)
- **Rotor size :** (Max dia x Barrel length x Total length x weight)
- HP Rotor – Max Dia 1500mm X 5495mm X 9250mm X 48.5 Ton.

LP ROTOR FORGING

Technical Requirement:

Material Grade: 26NiCrMoV11-5

C: 0.30 max	Si: 0.07 max	Mn: 0.15-0.40	P: 0.007 max
S: 0.007 max	Cr: 1.50 – 2.00	Mo: 0.30 – 0.55	Ni: 2.80-3.30
V: 0.07- 0.15	Al total: 0.010 max	Sn: 0.015max	Sb:0.0015max
As: 0.020 max	Cu: 0.15 max		

Melting & Refining Requirement: Vacuum Degassed Steel

Mechanical Property: 0.2%YS 760-860 Mpa, UTS 860-1040MPa , %E 15 min, %RA 45min, Impact 100Jmin, FATT <-10C , Tangential / Radial Sample from surface and axial core extracted from center of rotor

LP ROTOR FORGING

- **Dimension & Weight (Barrel Diameter X Barrel Length X Total Length X Weight):**
(Dia 1500 mm X 3060 mm X 6330) mm X 46.0Ton
- **NDT requirement:** 100% UT. MPI of axial bore and rotor transition. Residual Stress Measurement as per ASTM E837 or Ring Core Method of Siemens (60Mpa max)
- **Other Technical Requirement:** Axial core trepanning facility (Dimension of axial core: dia130mm; Length: ~1840mm)

TG ROTOR FORGING

Technical Requirement:

Material Grade: 26NiCrMoV14-5 (1.6948)

C: 0.30 max	Si: 0.07 max	Mn: 0.15-0.40	P: 0.007 max
S: 0.007 max	Cr: 1.50 – 2.00	Mo: 0.30 – 0.55	Ni: 2.80-3.30
V: 0.07- 0.15	Al total: 0.010 max	Sn: 0.015max	Sb:0.0015max
As: 0.020 max	Cu: 0.15 max		

Melting & Refining Requirement: Vacuum Degassed Steel

TG ROTOR FORGING

- **Mechanical Property:**
- Tangential / Radial Sample from surface and axial core extracted from center of rotor
- 0.2% YS: 760-860MPa, UTS: 860 -1040Mpa, %Elon: 15min, % RA: 45min, Impact: 100J min, FATT: -10C max .
- **Dimension & Weight (Barrel Diameter X Barrel Length X Total Length X Weight):**
(Dia1085) mm / (3650) mm X (9520) mm X (38.5) Ton
- **NDT requirement:** 100% UT. MPI of axial bore and rotor transition. Residual Stress Measurement as per ASTM E837 or Ring Core Method of Siemens (60Mpa max)
- **Other Technical Requirement:** Axial core trepanning facility (Dimension of axial core: dia230mm; Length: ≈2300mm)

Retaining Ring Forging

Technical Requirement:

Material Grade: X8CrMnN1818K (Cold Expanded)

Electro – slag re-melted steel / heat analysis:

C	Si	Mn	P	S	Cr	Ni	N
≤ 0.10	≤ 0.80	17.5 – 20.0	≤ 0.050	≤ 0.015	17.5 – 20.0	≤ 1.00	≥ 0.50

Al	Ti	V	B
≤ 0.025	≤ 0.10	≤ 0.15	≤ 0.001

Melting & Refining Requirement: ESR steel

Retaining Ring Forging

- **Manufacturing Process:** Hot forging for ring and further cold working using mandrel process or hydraulic process with working temperature below 300°C. Strain rate <2.5/minute. Explosive forming not permitted. Stabilization temperature at 340 – 360 °C with controlled heating and cooling
- **Retaining Ring ID1005 mm ,OD1140 mm, Height 760mm , 1340 kg**
- **Properties** At 100C , 0.2%YS 1050-1200 , UTS 1050min, %E 19min , %RA 58 min , Impact 50 J min.
- **NDT requirement:** 100% UT.

GLAND RING FORGINGS

Technical Requirement:

Material Grade: **21 Cr Mo V57** (Hardened and Tempered)

Element	<u>Percent</u> min. max.		Permissible variation, %
Carbon	0.17	0.25	± 0.02
Silicon	-	0.40	+ 0.05
Manganese	0.40	0.80	± 0.04
Chromium	1.20	1.50	± 0.05
Molybdenum	0.55	0.80	± 0.05
Vanadium	0.20	0.35	± 0.03
Sulphur	--	0.020	+ 0.005
Phosphorus	--	0.020	+ 0.005

Manufacturing Process: Forgings shall be manufactured from steel produced by the basic electric arc-furnace and subsequently vacuum degassed.

Requirement of full rings and half forged rings for various sizes and weights.

GLAND RING FORGINGS

- **Mechanical Properties:**

Property	Longitudinal	Transverse
Tensile strength, N/mm ²	700-850	700-850
Yield strength, N/mm ² ,min	550	550
Elongation (l= 5d), % min.	16	13
Reduction in area, % min.	60	35

- **NDT requirement:** 100% UT.

ANGLE RING FORGING (Nimonic)

Technical Requirement:

Material Grade: **Ni Cr 20 Ti Al** (Heat Treated)

Element	C	Si	Mn	P	S	B	Co	Fe	Cr	Al	Ti	Ni
Min.	0.04	-	-	-	-	-	-	-	18.0	1.00	1.80	-
Max.	0.10	1.00	1.00	0.010	0.010	0.008	1.00	1.50	21.0	1.80	2.70	Remainder

Melting & Refining Requirement: ESR steel

ANGLE RING FORGING (Nimonic)

- **Manufacturing Process:** Material shall be manufactured from electric furnace followed by a VOD treatment or melted under vacuum with possibly subsequently remelting or equivalent process.
- **Maximum Ring ID420 mm ,OD540 mm, Height 125mm , 95 kg**
- **Mechanical Properties:**

Tensile Strength N/mm ² Min.	0.2% proof Stress N/mm ² Min.	% Elongation l = 5.65 SO Min.	% Reduction in area of 'x' section Min.	Impact strength (ISO-V) J, Min.	Hardness BHN Min. (HB30)
1000 - 1300	600	12	12	20	305 - 405

- **NDT requirement:** 100% UT.

NIMONC ROUND (FORGING)

Technical Requirement:

Material Grade: **Ni Cr 20 Ti Al** (Heat Treated)

Element	C	Si	Mn	P	S	B	Co	Fe	Cr	Al	Ti	Ni
Min.	0.04	-	-	-	-	-	-	-	18.0	1.00	1.80	-
Max.	0.10	0.3	1.00	0.010	0.010	0.008	1.00	1.50	21.0	1.80	2.70	Remainder

Melting & Refining Requirement: ESR steel

NIMONC ROUND (FORGING)

- **Manufacturing Process:** Material shall be melted in a vacuum induction melting / electro slag remelting (VIM / ESR) or by vacuum induction melting / vacuum arc remelting (VIM / VAR) process.
- **Round bars of size dia 63 to dia 250.**
- **Mechanical Properties:**

Tensile Strength N/mm ² Min.	0.2% proof Stress N/mm ² Min.	% Elongation l = 5.65 SO Min.	% Reduction in area of 'x' section Min.	Impact strength (ISO- V) J, Min.	Hardness BHN Min. (HB30)
1000 - 1300	600	17	17	20	260

- **NDT requirement:** 100% UT.

HIGH TEMPERATURE ALLOY STEEL ROUND (FORGING)

Technical Requirement:

Material Grade: **20CrMoVTiB4 – 10** (Heat Treated AND Tempered)

Element	C	Si	Mn	P	S	B	Mo	V	Cr	Al	Ti
Min.	0.17	-	0.35	-	-	0.001	0.90	0.6	0.9	0.015	0.07
Max.	0.23	0.4	0.75	0.020	0.030	0.010	1.10	0.8	1.2	0.080	0.15

HIGH TEMPERATURE ALLOY STEEL ROUND (FORGING)

- **Manufacturing Process:** The steel shall be made by electric furnace process and degassed (e.g. vacuum degassed).
- **Round bars of size dia 63 to dia 200.**
- **Mechanical Properties:**

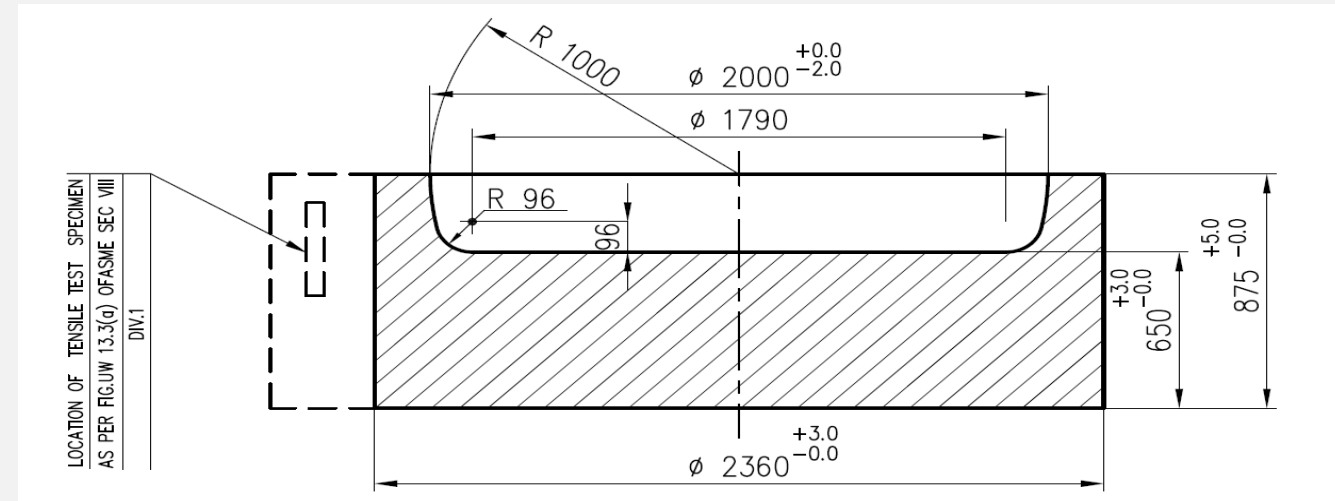
Tensile Strength N/mm ²	0.2% proof Stress N/mm ² Min.	% Elongation l = 5.65 SO Min.	% Reduction in area of 'x' section Min.	Impact strength (ISO-V) J, Min.	Hardness (Brinell)	Reduction in area (Min)
820 - 1000	660	15	15	40	245-310 BHN	50%

- **NDT requirement:** 100% UT.

Tube Sheet Forging

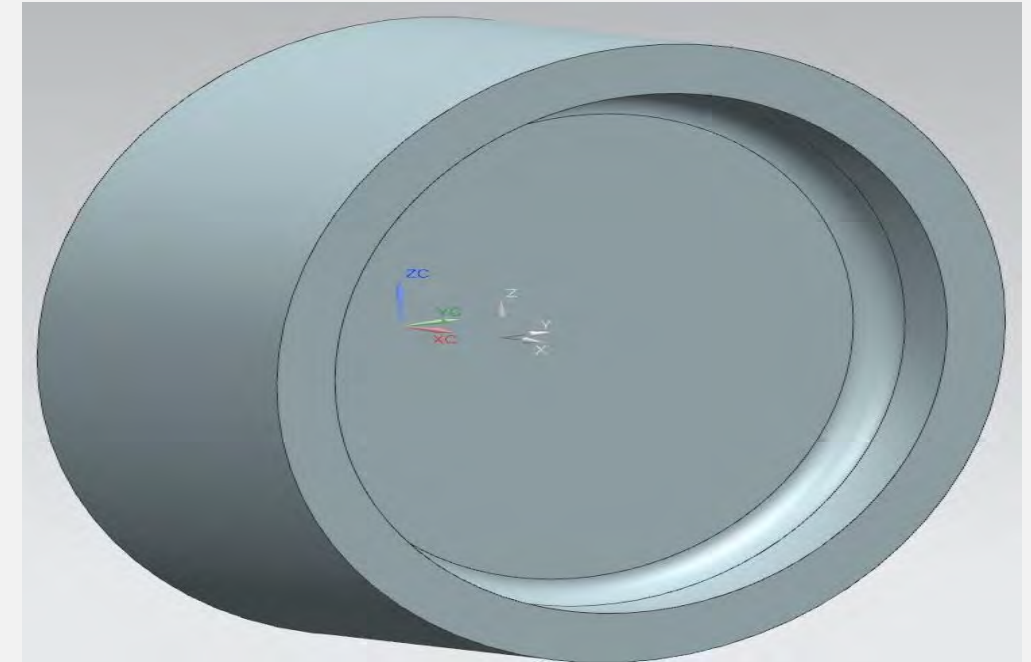
Technical Requirement:

Material Grade: SA 350 LF2 Cl.1.



Mechanical Properties:

Thickness mm	0.2 % Yield Strength N/mm ²	Tensile Strength N/mm ²	Elongation ($l_0 = 5d$) (%)	Hardness HB2.5/62.5
≤ 80	≥ 420	≥ 740	≥ 5	≥ 205
> 80	≥ 410	≥ 740	≥ 4	≥ 205



Tube Sheet Forging

- **Major Dimension:**

Tube Sheet Ring Forging – OD 2360mm, Height 875mm, Weight: 484kg.

- **NDT** : MT, PT & UT tested as per ASTM A 388

- **Impact test** : As per ASTM A 370 (Test temperature: - 45.6 deg.C)

- **Inspection and Certification** : CIB (Form III G to be submitted). Vendor works to be IBR approved

Outer Casing & Inner Casing Castings

Technical Requirement:

Material Grade: G 17 Cr Mo V 510, (1.7706)

Mechanical Property:

0.2% yield strength N/mm ² . (min)	Tensile strength, N/mm ² (min)	Elongation(l =5d)% (min)	Reduction in area %, (min)	Impact energy, J (See Note (1)) (min.)
440	590-780	15	40	27

Element	Melt analysis	
	Minimum	Maximum
C	0.15	0.20
Si	-	0.60
Mn	0.50	0.90
S	-	0.015
P	-	0.020
Mo	0.90	1.10
Cr	1.20	1.50
Ni	-	0.70
V	0.20	0.30
Cu	-	0.30
Al	-	0.040
Ti	-	0.025
Sb	-	0.010
Sn	-	0.025

Outer Casing & Inner Casing Castings

- **NDT requirement**: 100% UT and MPI. Radiography at weld end portions.
- **Testing Requirements**: Mechanical, NDT (UT & MPI), Microstructure.
- **Other Requirements**: Creep Rupture Test requirement for qualification of vendor.
- **Manufacturing Facility**: Handling, melting, and heat treatment facilities
- **Weight Range of Casing**:
 - Outer Casing: 35 / 45 Ton (Upper / Lower half).
 - Inner Casing: Upper Half: 18T, Lower Half: 18.5T

HEP, Bhopal

FORGINGS FOR HYDROGENERATOR

S.No	Hydrogenera tor Component	Standard / Grade	Use of the item	Quantit y require d per annum	Weigh t per unit (Appr ox. kg)	Total Suppliers in PMD	Indian Supplie r	Foreign Supplier (includin g Chinese supplier)	Remark
1	MAIN SHAFT	HG10035 / ASTM A668Clas s D/E	Torque Transmis sion	10 unit	>3300 0- 70000	15	1	12 (2)	Open tender done for Arun-III & Palamuru RR-2&3
2	POLE END PLATE	HG10080 /HG0600 4/AA193 33/IS:20 04 Class4	Clamping of pole piece	600 units	50- 350	9	9	0	Open tender done for Arun-III & Palamuru RR-2&3

BHEL support for Development of Suppliers



24x7 Online portal for registration

- Simple registration form
- Timebound evaluation



Product development support

- Drawings, specifications
- Tooling

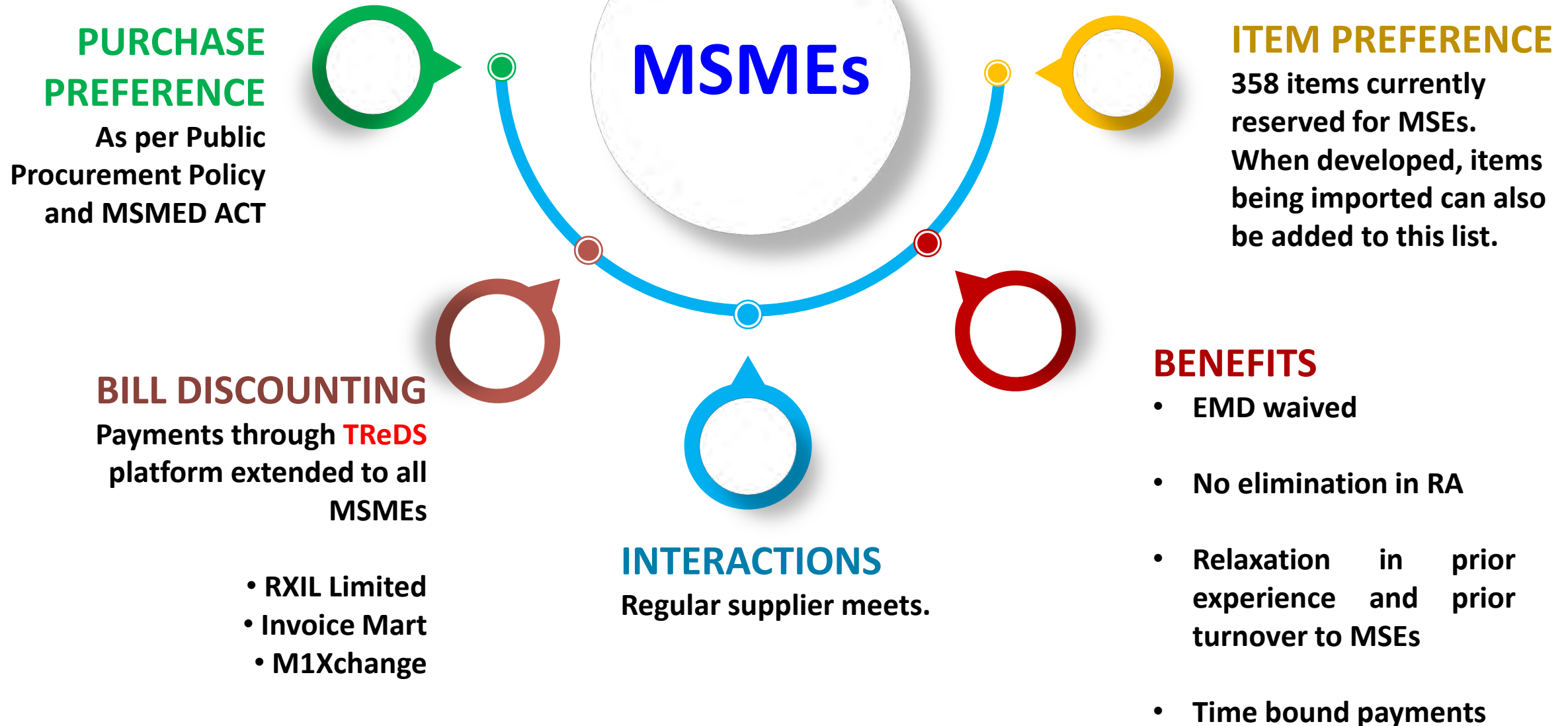


Hand holding with R&D and type testing



No LD/ penalty for developmental orders

BHEL support for MSMEs



BHEL support for Start-ups



BENEFITS

**Relaxation in prior
experience and turnover**



STARTUP RUNWAY

**BHEL is tendering its
requirements on GeM
wherein Startups can
supply goods as per the
Startup Runway on GeM**

Calendar for BHEL SAMVAAD

[Detailed list](#)

SNO	Category of Material	Date	Day	TIME
1	Raw Materials-Special/ Alloy/ Electrical Steel	29.12.2020	Tuesday	10:00 AM - 12:00 PM
2	Consumables for Foundry Applications	01.01.2021	Friday	10:00 AM - 12:00 PM
3	Welding Consumables of Special Grade	05.01.2021	Tuesday	10:00 AM - 12:00 PM
4	Castings & Forgings	08.01.2021	Friday	10:00 AM - 12:00 PM
5	Components-Mechanical	12.01.2021	Tuesday	10:00 AM - 12:00 PM
6	Insulating Materials	15.01.2021	Friday	10:00 AM - 12:00 PM
7	Components - Electrical & Electronics	19.01.2021	Tuesday	10:00 AM - 12:00 PM
8	Components – Solar	22.01.2021	Friday	10:00 AM - 12:00 PM
9	Systems & Packages	27.01.2021	Wednesday	10:00 AM - 12:00 PM

[Click here for filling up your details regarding your participation](#)

For any queries, please contact us on samvaad@bhel.in

Enrollment for BHEL SAMVAAD – Online Form submission

BHEL SAMVAAD

"An interaction forum with local industry for strengthening the cause of Aatma Nirbhar Bharat"

*Required

Supplier Name and address *

Your answer

Contact person Name *

Your answer

Contact person's email address *

Your answer

Contact person's Mobile No. *

Your answer

Category of Material (Kindly select your option, so that VC link invite is shared with you separately for the scheduled date and time) *

- ☐ Raw Materials-Special/ Alloy/ Electrical Steel - 29.12.2020 - 10:00 AM - 12:00 PM
- ☐ Consumables For Foundry Applications - 01.01.2021 - 10:00 AM - 12:00 PM
- ☐ Welding Consumables of Special Grade - 05.01.2021 - 10:00 AM - 12:00 PM
- ☐ Castings & Forgings - 08.01.2021 - 10:00 AM - 12:00 PM
- ☐ Components-Mechanical - 12.01.2021 - 10:00 AM - 12:00 PM
- ☐ Insulating Materials - 15.01.2021 - 10:00 AM - 12:00 PM
- ☐ Components - Electrical & Electronics - 19.01.2021 - 10:00 AM - 12:00 PM
- ☐ Components - Solar - 22.01.2021 - 10:00 AM - 12:00 PM
- ☐ System & Packages - 27.01.2021 - 10:00 AM - 12:00 PM

List of items proposed to be developed for BHEL *

Your answer

Submit



Thank You

Write to samvaad@bhel.in, to convey your interest