

PRE QUALIFICATION REQUIREMENT (PQR)
Flange-Lead In Plate, Pressure cap & Protection Cover

Dt: 23-11-2023

Application: Lead-in-plate is required for inter connecting fibre Optic End Winding Sensors from inside of generator to the external signalling devices. The generator shall be pressurized with H₂ gas up to 6 kg/cm².

Flange (Lead-in-plate) :-

- a) **Flange (Lead-in-plate) Code W96415210696/W96415211196**
- b) The vendor must have experience of supplying at least 6 nos Flange (Lead in plates) of Diameter ≥250mm (thickness 15mm min) in last 5 years from date of enquiry. Material of LIP shall be mild steel. Vendor to produce PQR and corresponding drawing in support of the same.
- c) Vendor should have facility for precision machining for achieving specified tolerances. Vendor to confirm and provide supporting document for the same.
- d) Wherever not mentioned, acceptable tolerance of 0.5mm is allowed. Vendor to confirm tools for achieving specified tolerance and measuring facility for the same.
- e) Hard chrome plating of 10 microns is required to be done. Vendor to confirm to comply the same.
- f) Vendor shall have facility for performing gas tightness Test of Flange. Test facility shall be equipped to perform testing of Flange with Nitrogen at 16 bar OR Helium gas at 10 bar.
- g) Vendor shall be asked to produce chemical test certificate of material at the time of inspection. Vendor to confirm for the same.

Pressure cap Code W96415210700

- a) Vendor shall have Mild steel or Aluminium casting facility.
- b) Vendor to qualify PQR of Flange (Lead-in-plate).


Protection Cover Code W96415210718

- a) Vendor shall have Mild steel or Aluminium casting facility
- b) Vendor to qualify PQR of Flange (Lead-in-plate).

c) Common Point for all 3 items- Vendor to confirm that it can supply all 3 items.

Notes:-

- 1) Flange shall be mounted on Turbo Generator of Power plant (rating 250MW to 800MW)
- 2) Material of LEAD-IN-PLATE shall be as Structural steel (weldable-quality)
- 3) If required, vendor to arrange any fixture for testing on their own.
- 4) It is informed that Generator shall be filled with pressurized Hydrogen of 6kg/cm².
- 5) Bidder to furnish reference list of important customers/ projects for our information. List must contain Project name, Customer name, M/c rating, Year of commissioning etc.
- 6) Bidder to confirm specific compliance wherever asked. BHEL reserves the right to verify information submitted by Bidder. In case the information is found false/ incorrect/ incomplete, the offer shall be rejected.

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN					TO BE FILLED BY BHEL			TO BE FILLED BY BHEL		
 BHEL	VENDOR'S NAME	ITEM	LEAD IN PLATE		QP NO.	QA/BE/QP/352						
				REV.	00	Date: 21.08.2023						
		Drg. No. & Rev.	As per PO									
		Spec.	TG60085, TG60079									
		Spec. Rev.	As per PO		Page 1 of 1							
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
									M	B	N	
1	2	3	4	5	6	7	8	9	D	10		11

1.0 RAW MATERIAL INSPECTION

1.1	Conductor & connector/pin & sleeves	Material grade	Major	Physical	1 Sample /Lot	Ord. Drg./Spec.	Ord. Drg./spec.	MTC	√	P	V	-	
1.2	Flange, Pressure cap, "O" rings	Material grade	Major	Physical	1 Sample /Lot	Ord. Drg./Spec.	Ord. Drg./spec.	TC/COC	√	P	V	-	
1.3	Sinter glass & epoxy resin	Material grade	Major	Physical	1 Sample /Lot	Ord. Drg./Spec.	Ord. Drg./spec.	TC/COC	√	P	V	-	
1.4	Protective cap, Allen bolt, washer	Material grade	Major	Physical	1 Sample /Lot	Ord. Drg./Spec.	Ord. Drg./spec.	TC/COC	√	P	V	-	

2.0 IN PROCESS INSPECTION


2.1	Process machining	--	Minor	Review	--	Ord. Drg./Spec.	Ord. Drg./spec.	-	-	P	-	-	
-----	-------------------	----	-------	--------	----	-----------------	-----------------	---	---	---	---	---	--

3.0 FINAL INSPECTION

3.1	Visual & Dimensional check	dimension sizes, shape, tolerances	Major	Measure	100%	Ord. Drg./Spec.	Ord. Drg./spec.	I.R.	√	P	W	-	
3.2	Surface finish & sintered glass free from any top up layer	smooth, cleanliness, extra deposits	Major	Visual	100%	Ord. Drg./Spec.	Ord. Drg./spec.	I.R.	√	P	W	-	
3.3	Dielectric test (H.V. test)	--	Major	Electrical	10% pins for each plate	Ord. Drg./Spec.	Ord. Drg./spec.	I.R.	√	P	W	-	
3.4	I. R. test (before & after H.V. test)	--	Major	Electrical	10% pins for each plate	Ord. Drg./Spec.	Ord. Drg./spec.	I.R.	√	P	W	-	
3.5	Strength test (Hydraulic test) for lead in plate & pressure cap	--	Major	Physical	100%	Ord. Drg./Spec.	No leakage	I.R.	√	P	W	-	
3.6	Gas tightness test	--	Major	Physical	100%	Ord. Drg./Spec.	Ord. Drg./spec.	I.R.	√	P	W	-	
3.7	Continuity of conductor/pins	--	Major	Electrical	100%	Ord. Drg./Spec.	Ord. Drg./spec.	I.R.	√	P	W	-	
3.8	Compliance of technical specification	--	Major	Review	100%	Ord. Drg./Spec.	Ord. Drg./spec.	COC	√	P	V	-	
3.9	Identification & marking	--	Major	Physical	100%	Ord. Drg./Spec.	Ord. Drg./spec.	--	-	P	V	-	
3.10	Packing	--	Major	Review	100%	Ord. Drg./Spec.	Ord. Drg./spec.	--	-	P	V	-	

Note: 1. Witness by inspection agency to be random 10% of each material code (minimum 1 pieces per material code) from each lot except clause 3.5 & 3.6 where 100% witness quantum is required.. However, vendor to carry out 100% tests internally and tests report shall be reviewed by inspection engineer during inspection at Vendor's works. 2. Manufacturer to maintain calibrated instrument having better accuracy than the item under the test. Inspection engineer shall check the same.

MANUFACTURER/ SUBCONTRACTOR	LEGEND: DRG: BHEL APPROVED DRAWING, ORD.: ORDERING, SPEC: SPECIFICATION, MTC: MATERIAL TEST CERTIFICATE, T.C.: TEST CERTIFICATE, I.R.: INSPECTION REPORTS, M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOMINATED INSPECTION AGENCY, N: CUSTOMER, 'P': PERFORM, 'W': WITNESS, 'V': VERIFICATION, "√" RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	Digitally signed by Sachin Jain Date: 2023.08.21 15:56:03 +05'30'	APPROVED BY
		FOR CUSTOMER USE	

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN					TO BE FILLED BY BHEL			TO BE FILLED BY BHEL			
	VENDOR'S NAME	ITEM	LEAD IN PLATE (For fibre optic end winding sensors)		QP NO.	QA/BE/QP/354								
					REV.	00	Date: 17.08.2024							
			Drg. No. & Rev.	31391201317 Rev. 00, 31391201318 Rev. 00, 31391201319 Rev. 00										
			Spec.	AA10119										
		Spec. Rev.	As per PO		Page 1 of 1									
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS		
									M	B	N			
1	2	3	4	5	6	7	8	9	D	10			11	

1.0 RAW MATERIAL INSPECTION

1.1	Flange, Pressure cap, pressure cover	Material grade	Major	Physical	1 Sample /Lot	Ord. Drg. /Spec.	Ord. Drg. /spec.	MTC	√	P	V	-	
1.2	O rings, Allen bolt, washer etc.	Material grade	Major	Physical	1 Sample /Lot	Ord. Drg. /Spec.	Ord. Drg. /spec.	COC	√	P	V	-	

2.0 IN PROCESS INSPECTION

2.1	Process machining	--	Minor	Review	--	Ord. Drg. /Spec.	Ord. Drg. /spec.	-	-	P	-	-	
-----	-------------------	----	-------	--------	----	------------------	------------------	---	---	---	---	---	--

3.0 FINAL INSPECTION

3.1	Visual & Dimensional check	Free from defect, dimensions	Major	Measure	10%	Ord. Drg. /Spec.	Ord. Drg. /spec.	I.R.	√	P	W	-	
3.2	Hard chrome of flange	Min 10 micron	Major	Physical	10%	Ord. Drg. /Spec.	Ord. Drg. /spec.	I.R.	√	P	W	-	
3.3	Nickel Plating of protection cap & cover	Ni plating	Major	Physical	10%	Ord. Drg. /Spec.	Ord. Drg. /spec.	I.R.	√	P	W	-	
3.4	Gas tightness test for pressure cap with Nitrogen	12 bars for 30 mins	Major	Physical	100%	Ord. Drg. /Spec.	No leakage	I.R.	√	P	W	-	
3.5	Preservation of materials	Anti-rust paint	Major	Electrical	10%	Ord. Drg. /Spec.	Ord. Drg. /spec.	I.R.	√	P	W	-	
3.6	Compliance of technical specification	--	Major	Review	100%	Ord. Drg. /Spec.	Ord. Drg. /spec.	COC	√	P	V	-	
3.7	Identification & marking	--	Major	Physical	100%	Ord. Drg. /Spec.	Ord. Drg. /spec.	--	-	P	V	-	
3.8	Packing	--	Major	Review	100%	Ord. Drg. /Spec.	Ord. Drg. /spec.	--	-	P	V	-	

Note: 1. Witness by inspection agency to be random 10% of each material code (minimum 1 piece per material code) from each lot except clause 3.4 where 100% witness quantity is required. However, vendor to carry out 100% tests internally and tests report shall be reviewed by inspection engineer during inspection at Vendor's works. 2. Vendor has to provide TC/IR mentioning above Q.P. clauses and also index/summary sheet for co-relation of TC/IR with QP clauses. TPIA to check the same.

Digitally signed
by Sachin Jain
Date:
2024.08.17
10:11:39 +05'30'

MANUFACTURER/ SUBCONTRACTOR	LEGEND: DRG: BHEL APPROVED DRAWING, ORD.: ORDERING, SPEC: SPECIFICATION, MTC: MATERIAL TEST CERTIFICATE, T.C.: TEST CERTIFICATE, I.R.: INSPECTION REPORTS, M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOMINATED INSPECTION AGENCY, N: CUSTOMER, 'P': PERFORM, 'W': WITNESS, 'V': VERIFICATION, "√" RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE	APPROVED BY
--------------------------------	--	------------------	-------------

MANUFACTURER'S NAME AND ADDRESS			QUALITY PLAN					TO BE FILLED BY BHEL		TO BE FILLED BY BHEL				
BHEL	VENDOR'S NAME	ITEM			QP NO.									
					REV									
		DRG. NO.	AS PER PO											
		SPEC.	AS PER PO											
		REV				Page 1 of 1								
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY			REMARKS
											M	B	N	
1	2	3		4	5	6	7	8	9	D	10			11

MANUFACTURER/SUBCONTRACTOR		LEGEND:	FOR CUSTOMER USE	APPROVED BY
		! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.		
		M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		