

Mandatory Pre-Qualification requirements for Lead-in-Plate
Material Code-W96413502282 as per Specification TG00009
Indent Number-20212451

Description:

The Lead-in-Plate is used in generators. It is utilized for connecting the wires from inside to outside the generator. The Lead-in-Plate should be of very reliable and proven design to maintain the required electrical connection and prevent leakage of hydrogen (Pressure inside the generator is between 5-7 kg/cm² gauge) under all operating conditions as Hydrogen is inflammable gas.

- 1.0** The vendor should be a regular manufacturer of such Lead-in-Plate with minimum following requirements -

Sl No.	Parameter	Value
(i)	Nominal Voltage and Current	380V and 10A
(ii)	Insulation	Min 100M Ohm at 500VDC
(iii)	Operating Temperature	0°C to 85°C
(iv)	Flange material	IS-2062 or Equivalent
(v)	Dielectric strength	No flashover ,testing voltage 3000VDC(Min) for one minute
(vi)	Pressure Test	16 bar with water
(vii)	Pin and Insulation Material	NiFe45 and Sintered Glass

- 2.0** In support of above serial number-1, vendor shall furnish technical details of Lead-in-Plate in below mentioned format for at least one nos. (1) of the P.O. executed in past 10 years (from date of enquiry) along with P.O. copies.

S. No.	Brief technical details	Application	Name & address of customer	Date of supply
1	-Nominal Voltage and Current -Flange, Pin and Insulation Material -Pressure Test -Number of Pins -Dielectric Test	Hydrogen cooled generator or similar application		

- 3.0** Vendor to furnish correlated test certificates including Pressure test against one of the P.O. submitted as per clause 2.
- 4.0** Vendor to furnish acceptance certificate from the end user of Lead-in-Plate against the P.O. submitted as per clause 2. (Original Certificate or through e-mail directly from the customer). Acceptance certificate should contain information like item details and its application or correlation with P.O.

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- 5.0 The vendor should have in-house manufacturing facilities for manufacturing of Lead in Plate. Vendor to furnish details of the manufacturing facilities available at their works along with photographs
- 6.0 The vendor should have facilities for carrying out the following tests and provide details of test equipment available at their works.
- 1) Insulation Resistance Test
 - 2) Voltage Test
 - 3) Pressure Test
 - 4) Dielectric Test
- 7.0 The testing facilities available at vendor's works should be duly calibrated against measurement standards traceable to national/international measurement standards. Vendor to confirm the same.
- 8.0 Lead in plate shall be tested for gas tightness with helium at 1 bar for 30 mins at BHEL works. Leakage rate shall be less than 1×10^{-6} m bar l/s, if leakage rate found more than permissible limit, lead in plate shall be rejected.

Note: BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.

Mandatory Pre-Qualification requirements for Lead-in-Plate as per (TG600009)
Material code – W96413900334

Description:

The Lead-in-Plate is used in generators. It is utilized for connecting the wires from inside to outside the generator. The Lead-in-Plate should be of very reliable and proven design to maintain the required electrical connection and prevent leakage of hydrogen under all operating conditions.

- 1.0** The vendor should be a regular manufacturer of such Lead-in-Plate with following requirements -


Si No.	Parameter	Value
(i)	Nominal Voltage and Current	Min. 300V and min. 10A
(ii)	Insulation	Min. 100M Ohm at 500V (min.)
(iii)	Flange material	As per IS 2062 or equivalent
(iv)	Pressure Test	Min 10 bar with water
(v)	Dielectric Test	1kV (minimum) DC for 1 min
(vi)	Pin and Insulation(Filling) Material	Ni 54/NiFe45/Cu and Sintered Glass

- 2.0** In support of above, vendor shall furnish technical details of Lead-in-Plate in below mentioned format for at least one no. (1) of the P.O. executed in past 10 years (from date of enquiry) along with P.O. copies meeting requirements as per point no. 1.

S. No.	Brief technical details	Application	Name & address of customer	Date of supply
	-Nominal Voltage and Current -Flange, Pin and Insulation Material -Operating Temperature -Dielectric Test -Pressure Test -Number of Pins			

- 3.0** Vendor to furnish test certificates having details such as Dielectric Test, Pressure Test etc., against any one of the P.O. submitted as per clause 2.
- 4.0** Vendor to furnish material Test Certificates for Pin, Sintered glass and flange against any one of the P.O. submitted as per clause 2.
- 5.0** Vendor to furnish acceptance certificate from one of the end users of Lead-in-Plate against any one of the P.O. submitted as per clause 2. (Original Certificate or through e-mail directly from the customer). Acceptance certificate may contain information like item details and its application or correlation with P.O.

Note: BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.

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 (6, 101 Pin)		QP NO.	QA/BE/QP/351						
					REV.	01	Date: 27.02.2023					
		Drg. No. & Rev.		As per PO								
		Spec.		TG00009 (6 & 101 Pin)								
		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	Pin : Material grade, chemical, physical, mechanical & elec. properties including tin plating	Major	Physical	1 Sample /Lot	Ord. Drg./TG00009	Ord. Drg./TG00009	TC/ COC	√	P	V	-	
1.2	Flange	--	Major	Physical	1 Sample /Lot	Ord. Drg./TG00009 /AA10119	Ord. Drg./TG00009 /AA10119	TC/ COC	√	P	V	-
1.3	Sinter glass	--	Major	Physical	1 Sample /Lot	Ord. Drg./TG00009	Ord. Drg./TG00009	TC/ COC	√	P	V	-
2.0 IN PROCESS INSPECTION												
2.1	Process machining	--	Minor	Review	--	Ord. Drg./TG00009	Ord. Drg./TG00009	-	-	P	-	-
3.0 FINAL INSPECTION												
3.1	Visual & Dimensional check	dimension sizes, shape, tolerances	Major	Measure	100%	Ord. Drg./TG00009	Ord. Drg./TG00009	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./TG00009	Ord. Drg./TG00009	I.R.	√	P	W	-
3.3	Dielectric test (H.V. test)	--	Major	Electrical	10% pins for each plate	Ord. Drg./TG00009	Ord. Drg./TG00009	I.R.	√	P	W	-
3.4	I. R. test (before & after H.V. test)	--	Major	Electrical	10% pins for each plate	Ord. Drg./TG00009	Ord. Drg./TG00009	I.R.	√	P	W	-
3.5	Strength test (Hydraulic test)	Type & routine both	Major	Physical	100% for routine, 10% for type	Ord. Drg./TG00009	No leakage	I.R.	√	P	W	-
3.6	Gas tightness test (Helium gas)	--	Major	Physical	100%	Ord. Drg./TG00009	Ord. Drg./TG00009	I.R.	√	P	W	- Note 3
3.7	Compliance of technical specification	--	Major	Review	100%	Ord. Drg./TG00009	Ord. Drg./TG00009	COC	√	P	V	-
3.8	Identification & marking	--	Major	Physical	100%	Ord. Drg./TG00009	Ord. Drg./TG00009	I.R.	-	P	V	-
3.9	Packing	--	Major	Review	100%	Ord. Drg./TG00009	Ord. Drg./TG00009	--	-	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 3.5 & 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. 3. Lead in plate will be tested for gas tightness with helium at 1 bar for 30 minutes either at BHEL or vendor's works (as confirmed by Engg. by e-mail). Leakage rate shall be less than permissible limit 1×10^{-6} m bar l/s. If leakage rate is found more than permissible limit, lead in plate shall be rejected.

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: END 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	Digitally signed by Sachin Jain Date: 2023.02.27 09:30:16 +05'30'
			APPROVED BY