 BHOPAL	TECHNICAL PRE-QUALIFICATION REQUIREMENTS (PQR) FOR VENDORS	PQR/ISE/VPI(R+H)/EOI/2018/20
	INSULATION SYSTEMS ENGINEERING	Rev. No.: 01
	PRE-QUALIFICATION REQUIREMENTS (PQR) FOR IDENTIFICATION OF NEW VENDORS FOR PROCUREMENT OF BISPHENOL-A EPOXY RESIN AND ANHYDRIDE HARDENER TO BHEL BHOPAL SPECIFICATIONS BP-27664 & BP-27669 THROUGH EOI	Rev. Dt.: 05/08/2020
		Sht. 1 of 6 shts.

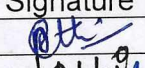
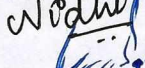

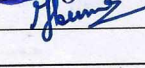
BHEL is manufacturing various types of rotating electrical machines (motors & generators) for Thermal, Hydro & Nuclear power plants / industries / traction applications etc. In these machines, various types of insulating materials are required for providing proper electrical isolation between live and earthed parts. These Motors and Generators, for their stators/rotors, have either Global VPI impregnation or individual/group of bars Vacuum Pressure Impregnation. They are expected to have a very long working life.

This specification details the Pre-Qualification Requirements for vendors for supplying extremely high purity Bisphenol-A Epoxy Resin & Anhydride Hardener system suitable for above-mentioned Vacuum Pressure Impregnation. The insulation tapes used in stator coils / rotor bars for inter-turn/ inter-strand, slot wall and end winding insulation have a special accelerator based on either zinc naphthenate/ Deca zinc or TMPTA/ Ethylpiperazin/ dimethyl benzyl amine. The epoxy resin and hardener, when mixed (in the ratio of 100:120) are expected to react in the presence of above accelerator under vacuum and pressure impregnation followed by curing at elevated temperature, and become a solid monolithic mass. The epoxy resin and hardener shall be as per BHEL, Bhopal technical specifications BP 27664 & BP 27669 however, any minor deviations may be allowed (at the discretion of BHEL) depending upon meeting final requirements satisfactorily. The insulation class of the composite system after VPI process should be at least Class-F. The annual procurement quantity of this resin-hardener combined is approximately 100-150 Tons at BHEL, Bhopal.


The material is very critical as it is the key ingredient of insulation system on which life of BHEL motors & generators depends. The material should be of highest quality & purity. Hence meeting the technical requirements laid down by BHEL are highly critical.

This PQR is being issued for identification/ location of additional vendors for this combination of materials.

Pointwise compliance to be submitted by interested vendors as per details on the next page.

Distribution:	Date of Rev. 00: 15/05/2018	Name	Signature
AME HGE MEX LEM/IMM/CIM ISE	Prepared by	Abha Otti	
	Checked by	Nidhi Gupta/ Bishwanath Oraon	
	Approved by	Anirudha Tijare	
	Issued by	Gautam Kumar	
BHEL, BHOPAL			



 <b>BHOPAL</b>	<b>TECHNICAL PRE-QUALIFICATION REQUIREMENTS (PQR) FOR VENDORS</b>		PQR/ISE/VPI(R+H)/EOI/2018/20
	<b>INSULATION SYSTEMS ENGINEERING</b>		Rev. No.: 01
	<b>PRE-QUALIFICATION REQUIREMENTS (PQR) FOR IDENTIFICATION OF NEW VENDORS FOR PROCUREMENT OF BISPHENOL-A EPOXY RESIN AND ANHYDRIDE HARDENER TO BHEL BHOPAL SPECIFICATIONS BP-27664 &amp; BP-27669 THROUGH EOI</b>		Rev. Dt.: 05/08/2020  Sht. 2 of 6 shts.


  

Cl. No	Description	Vendor to comment	
		Complied	Relevant supporting documents to be submitted
1.	Offers of only original manufacturers or their authorized distributors are acceptable.	Yes/No	Certificate/ documentary evidence of being original manufacturer of this item  For authorized distributor : Valid authorization letter/ certificate from OEM to be submitted
2	Complete compliance to technical specifications BP 27664 & BP 27669	Yes/No	Clause by clause acceptance or signed & stamped copies of specifications BP 27664 & BP 27669 to be submitted. However, any minor deviations will also be acceptable if the material meets our application requirements. The technical decision to accept/ decline deviations rests with BHEL. The materials should meet our specifications BP27664 & BP27669 and the combined properties of mixture in the recommended mixing ratio. The material should also meet our application requirements.


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 BHOPAL	TECHNICAL PRE-QUALIFICATION REQUIREMENTS (PQR) FOR VENDORS	PQR/ISE/VPI(R+H)/EOI/2018/20
	INSULATION SYSTEMS ENGINEERING	Rev. No.: 01
	PRE-QUALIFICATION REQUIREMENTS (PQR) FOR IDENTIFICATION OF NEW VENDORS FOR PROCUREMENT OF BISPHENOL-A EPOXY RESIN AND ANHYDRIDE HARDENER TO BHEL BHOPAL SPECIFICATIONS BP-27664 & BP-27669 THROUGH EOI	Rev. Dt.: 05/08/2020 Sht. 3 of 6 shts.

Sl. No	Description	Vendor to comment	
		Complied	Relevant supporting documents to be submitted
3.	The manufacturing firm must have adequate manufacturing facilities at their works/ in-house for manufacturing these materials	Yes/No	<ol style="list-style-type: none"> <li>1. List of plant &amp; machinery facilities available for manufacturing the said item, at manufacturer's works to be provided.</li> <li>2. Pictures of manufacturing facility to be submitted.</li> </ol>
4.	Testing facilities required to conduct all the tests as per specs BP 27664 & BP 27669 must be available with the firm. List of outsourced facilities, if any, to be submitted. Outsourced labs/ firms should be Govt/ NABL/ ISO/ IEC accredited	Yes/No	Details of testing facilities available with the firm required for testing of said item along with list of outsourced facilities (if used), to be provided. Documentary evidence of NABL/ other accreditation of outsourced labs to be submitted
5.	The firm should have minimum manufacturing & supply capacity of 25 Tons (combined resin & hardener) per month.	Yes/No	Confirmation to be provided
6.	Vendor to furnish QAP that shall be followed during manufacturing of resin and hardener. An indicative QA plan is given in the Annexure-1	Yes/No	QAP duly filled & signed
7.	Manufacturing facilities assessment may be carried out by BHEL at supplier's works if required. Vendor to confirm the same	Yes/No	Confirmation to be provided



 BHEL BHOPAL	TECHNICAL PRE-QUALIFICATION REQUIREMENTS (PQR) FOR VENDORS		PQR/ISE/VPI(R+H)/EOI/2018/20
	INSULATION SYSTEMS ENGINEERING		Rev. No.: 01
	PRE-QUALIFICATION REQUIREMENTS (PQR) FOR IDENTIFICATION OF NEW VENDORS FOR PROCUREMENT OF BISPHENOL-A EPOXY RESIN AND ANHYDRIDE HARDENER TO BHEL BHOPAL SPECIFICATIONS BP-27664 & BP-27669 THROUGH EOI		Rev. Dt.: 05/08/2020
			Sht. 4 of 6 shts.

Sl. No	Description	Vendor to comment	
		Complied	Relevant supporting documents to be submitted
8.	The firm should have manufacturing and supply experience of at least 300 Tons of same/ similar (Epoxy resin & Hardener system) material during the last 5 years.	Yes/No	Copies of unpriced POs / invoices.
9.	In case of technical qualification in the above points 1 to 8, vendor to supply a free sample (at least 5 Kgs of Resin & 5 Kgs of hardener) meeting technical requirements as per spec. BP27664 & BP27669 for testing and lab evaluation at BHEL, Bhopal.	Yes/No	Confirmation to be provided


**Non-Qualifying information to be submitted by the vendor**

10.	Year of Establishment	-	Information to be submitted
11.	Whether the vendor is registered with BHEL Bhopal or any other unit of BHEL?	Yes/No	If yes, the name of BHEL unit where registered along with vendor code and list of items for which registered to be provided.
12.	Is the company ISO 9001 certified	Yes/No	If Yes, valid ISO 9001 certificate to be submitted
13.	Customer list	-	List of major customers of resin-hardener to be submitted, preferably from manufacturing industry like BHEL.


  

BHEL, BHOPAL



 BHOPAL	TECHNICAL PRE-QUALIFICATION REQUIREMENTS (PQR) FOR VENDORS	PQR/ISE/VPI(R+H)/EOI/2018/20
	INSULATION SYSTEMS ENGINEERING	Rev. No.: 01
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		Sht. 5 of 6 shts.
<p><b>New Vendors will have to get themselves registered in BHEL as per BHEL's standard vendor assessment &amp; registration procedure before placement of purchase order.</b></p> <p><b>Note:</b></p> <ol style="list-style-type: none"><li>1. For any technical information, Insulation Systems Engineering Division (ISE) of BHEL Bhopal can be contacted at <a href="mailto:ise.bpl@bhel.in">ise.bpl@bhel.in</a>.</li><li>2. Vendors qualifying in the above requirements (Clause 1 to 9), and subject to technical clearance of samples provided for testing, will be considered for placement of development/ trial orders for small quantities. After successful completion/ execution of trial orders, the vendor may be considered for addition in BHEL's list of approved vendors for supplying these materials.</li><li>3. This PQR is applicable for compliance by manufacturers. In case of authorized distributors, compliance of OEM to be given.</li><li>4. BHEL reserves the right to verify the information submitted by the vendor. In case the information submitted is found false or incorrect, the offer will be rejected and the vendor is liable to be blacklisted.</li></ol>		
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 <b>BHOPAL</b>	TECHNICAL PRE-QUALIFICATION REQUIREMENTS (PQR) FOR VENDORS	PQR/ISE/VPI(R+H)/EOI/2018/20
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### ANNEXURE -1

**Indicative QAP to be submitted by vendor shall cover following**

- 1.0 Organization chart clearly bringing out the quality set up.
- 2.0 Qualification of quality control personnel.
- 3.0 Process flow chart indicating step by step process of manufacturing of final product from raw material.
- 4.0 Quality Assurance System – Inspection and testing plan with formats to be filled up for following:
  - i. Incoming material
  - ii. Process control
  - iii. Product Control

Above must be furnished in the following format :

Sl. No	Subject/ Product/ Process	Sample size and its frequency of inspection	Parameters of Inspection	Mode of inspection equipment used	Acceptance limits/ criteria/ specified value as per specification

**BHEL, BHOPAL**