

I  HARIDWAR	Mandatory Technical Pre-Qualification Requirements (PQR) for Stationary Blade Rings IPT STE-TB/PQR/10621/001	Rev. No. 00 Page 1 of 4
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"Stationary Blade Ring" for Super-critical IP Turbine in completely finish machined condition is required as per drawing and details in the enquiry.

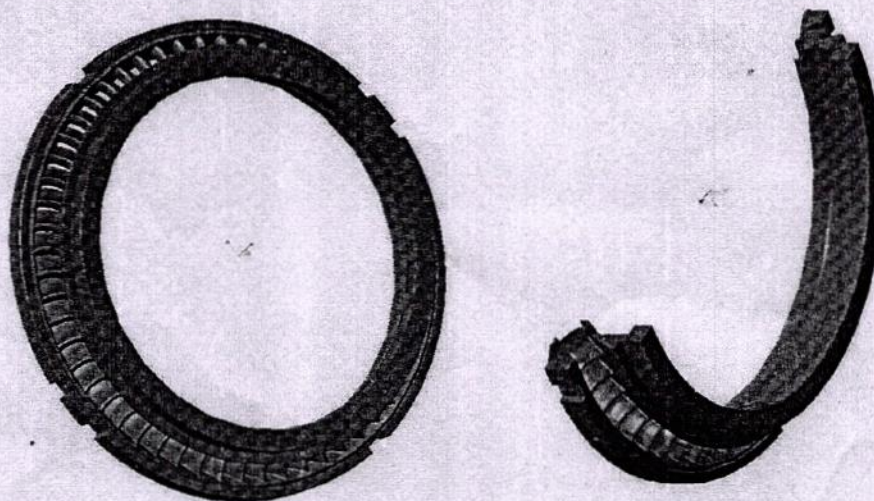


Figure: Stationary Blade Ring Complete and in Half part (Upper Part and Lower Part identical)

Stationary Blade Ring (SBR-IPT) is machined from mono block forged rings in two halves. SBR-IPT is used in the First stage of IP turbine which is a zone of high temperature. This SBR is subjected to extreme creep fatigue stresses and is manufactured under close tolerances and with special machining operations performed on it.

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Vendor must fulfill the following Pre-Qualification Requirements (PQR). Offers of vendors not meeting these requirements will not be considered.

1. Vendor must have experience of manufacturing and supplying at least two machined components similar to Stationary Blade Ring (Drg. attached) i.e. complete integral ring or ring in two halves of size range:

Outer Diameter -900 mm and above

Width – 150 mm and above

With throat (gap) between the blade profiles in range of 15 mm to 28 mm.

The supplied ring should be of material grade: X12CrMoWVNbN10-1-1 (ESR Hardened and Tempered) or X22CrMoV121+QT1 (Hardened and Tempered) or any similar heat treated material, having integral enclosed twisted blade profiles similar to shown in drawing.

In support of past experience, vendor to submit information in the format below about the customer(s)/Company where such component has been supplied during the last 7 years:

SL.No	Name of Customer	Detail Address	Name, Phone no. and email Id of contact person	Purchase order No.	Date of Supply	Quantity

Vendor to submit the following documents as an evidence of acceptance of supplied component, for the above mentioned successfully executed orders:

- a) End user certificate or two Un-Priced Purchase Orders (POs) copies from the same customer.
- b) Test Certificates of component for the two nos. of unpriced POs referred above.
- c) Drawing/sketch/photograph of supplied component detailing the broad dimensions.

for at least two of the above mentioned successful executed order/supply.

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2. Vendor must have In-house machining facilities to manufacture subject Stationary Blade Rings as per drawing enclosed in enquiry. Details of machining facilities (List of Machines with type of machine & broad specifications - which will be used for manufacturing of subject Stationary Blade Rings) to be submitted with offer.

In case, if any manufacturing operation is to be carried out by the vendor at its sub-vendor works, Vendor to provide detail of this manufacturing operation & applicable facility / machine details & broad specifications. In addition to this, vendor to submit copy of agreement between vendor & its sub-vendor with offer, clearly mentioning the agreement for carrying out above referred operation at sub-vendor works, in case of order.

3. Vendor to procure the Forging (Raw Material) for Stationary Blade Ring from BHEL approved sources as per Annexure 1, Vendor to confirm.

OR

Forging from other than BHEL approved vendors may also be considered with prior approval of BHEL. Process qualification of forging will be required as per BHEL enquiry specification. For approving other than BHEL approved forging supplier, vendor to submit following details for BHEL acceptance:

- Details of their forging supplier
- Past experience of forging supplied in enquiry material grade. At least one test certificate of forging to be submitted.
- Raw material source for billet / bloom / ingot for forging with past experience and creep rupture data (if available).

4. Vendor should have In-house Inspection/Testing/Checking facilities for items in the enquiry, or should have competent sub-vendors to inspect/test/check the items in the enquiry using tools such as 3D-CMM. Details of testing facilities (List of facilities / equipment with type & broad specifications) to be submitted with offer.

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5.
 - a) Vendor to submit Manufacturing Plan (Detailing all the stages of manufacturing from Raw material to Finish Machining with details of facility/machine used for each manufacturing & inspection stage) for the components referred at Sr. no. 1 (i.e. already manufactured and supplied by the vendor).
 - b) Vendor is also required to submit Manufacturing plan (Detailing all the stages of manufacturing from Raw material to Finish Machining with details of facility/machine used for each manufacturing & inspection stage envisaged by vendor for manufacturing of Stationary Blade Ring (Drg. attached in the enquiry).
 - c) Manufacturing plan (as per sr. no. b above) should ensure that all the requisite dimensions & surface finish of the final finished product must be as per drawing & there should not be any visual defects like waviness, line mark, steps, chatter marks etc. on the Ring. Vendor to confirm.
6. Vendor to confirm that in case of order, it will provide the detailed Quality Plan.

Important Note:

- a. Vendor to study all drawings & specifications thoroughly as given in the enquiry, before acceptance of PQR clauses.
- b. All the drawings, documents, standards and other details with respect to this enquiry are confidential and must not be used directly or indirectly in any way detrimental to the interest of BHEL.
- c. All the documents and correspondences shall be accepted in English language only.
- d. Vendor to note that all tools and technological items required for the manufacturing of said item shall be arranged by the vendor, in case of order.
- e. BHEL team may visit vendor works to assess vendor's manufacturing and testing facilities, if required.
- f. Vendor to note that the coordinates for the profile of Stationary Blade Ring in the form of X,Y,Z coordinates will be provided to vendor in ASCII format in case of order. BHEL will not provide 3D model to the vendor.

Note to PPX-T:

Quality related requirements (product specific & customer specific etc.) are to be taken separately from Quality department.

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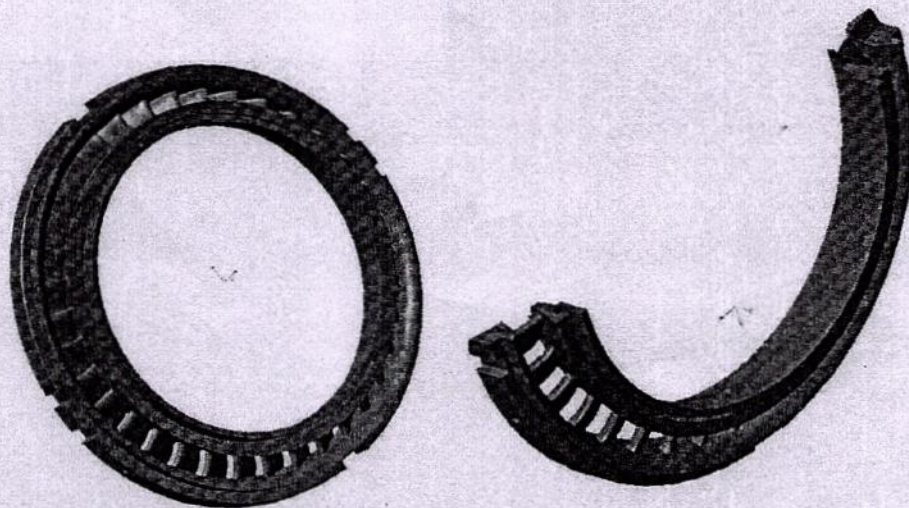


Figure: Stationary Blade Ring Complete and in Half part (Upper Part and Lower Part identical)

Stationary Blade Ring (SBR-HPT) is machined from mono block forged rings in two halves. SBR-HPT is used in the First stage of HP turbine which is a zone of high temperature and pressure. This SBR is subjected to extreme creep fatigue stresses and is manufactured under close tolerances and with special machining operations performed on it.

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1. Vendor must have experience of manufacturing and supplying at least two machined components similar to Stationary Blade Ring (Drg. attached) i.e. complete integral ring or ring in two parts of size range:

Outer Diameter -800 mm and above

Width - 120 mm and above

With throat (gap) between the blade profiles in range of 15 mm to 24 mm.

The supplied ring should be of material grade: X12CrMoWVNbN10-1-1 (ESR Hardened and Tempered) or X22CrMoV121+QT1 (Hardened and Tempered) or any similar heat treated material, having integral enclosed twisted blade profiles similar to shown in drawing.

In support of past experience, vendor to submit information in the format below about the customer(s)/Company where such component has been supplied during the last 7 years:

SL.No	Name of Customer	Detail Address	Name, Phone no. and email Id of contact person	Purchase order No.	Date of Supply	Quantity

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- a) End user certificate or two Un-Priced Purchase Orders (POs) copies from the same customer.
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Note to PPX-T:

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ANNEXURE - 1

1	Specification : HW19390 (X22CrMoV12-1)
	Mackeill Ispat and Forgings
	Starwire India Ltd.
	Good Luck Engineering, Ghaziabad
	CHW Forge, Ghaziabad
	R. D. Forge, Ghaziabad
	Bharat Heavy Electricals Limited, Haridwar
	Vikrant Forge Limited, Kolkata
	Bay-Forge Limited, Chennai
	Forgital Italy S.P.A
	Note: Raw material for forging (ingot / bloom) to be procured from any of the following BHEL approved source by forgemaster: CFFP, BHEL, Haridwar Arcvac Forge Cast, Kolkata Starwire India Ltd, Ballabgarh Saarloha Advance Material, Pune MIDHANI, Hyderabad SAIL, Mahindra Sanyo, Khopoli Metal Ravne, Slovenia BGH, Germany, Bohler Germany
2	Specification: HW19460