

BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
QUALITY CONTROL TRANSPORTATION
QUALITY ASSURANCE PLAN (QAP)

Ref.: TM12545 Rev. 09 Dt.28.05.2024

QA Plan for fully finished components (with finish dimensions final machined on CNC machines) with mandatory requirement of checking on 3D CMM, supplied on fully finish basis or labour basis
Note: Components to be finished machined on CNC are Stator frame, Bearing assy. components (including end shields), Suspension tube & its assy. Components.

Part 1: Final inspection of the component before dispatch from vendor works (#)

Sl. No.	Name of the Process	Parameters of Inspection	Quantum of Check*		Mode of Inspection/ Equipment used	Drawing No./Spec./Std.	Acceptance Norms***	Requirement from supplier
			TP (Supplier)	Inspection agency				
1.	Raw material	Applicable only in case order is executed on fully finish basis						
	a. If the raw material is casting	Applicable QAP No.: QTM/QAP/VENDOR/13-14/001 (latest revision) [Witness & Verification of RT reports & films for correlation with components, only record verification of material testing/checking parameters and verification of 3 test samples (keel blocks separately cast/integrally cast as per specification to be supplied along with consignment.) as per raw material QAP to be done by TPI. No inspection/record verification for cast/rough machined dimensions as per casting QAP.]						
	b. If the raw material is fabrication/plate	Applicable QAP No.: QTM/QAP/FABRICATED ITEMS/VENDOR/18-19/01 (latest revision) [Only record verification of testing/checking parameters and verification of TC of plate used for fabrication of component (to be supplied along with consignment) as per raw material QAP to be done by TPI. No inspection/record verification for fabricated/rough machined dimensions as per fabrication QAP.]						
	c. If the raw material is forging	Applicable QAP No.: QTM/QAP/VENDOR/13-14/002 (latest revision) [Only record verification of testing/checking parameters and verification of 3 test samples to be supplied along with consignment) as per raw material QAP to be done by TPI. No inspection/record verification for forge/rough machined dimensions as per forging QAP.]						
2.	Dimensions	A) Critical to quality (CTQ) dimensions as marked in drawing. B) Other dimensions	A) 100%	A) 20% (Min.) \$	3D CMM	As per relevant BHEL Drawing	As per relevant BHEL Drawing	\$-Inspection of 3D CMM checking shall be done Either by RDSO or TPI(A/supplier to confirm before call booking) in case of TM 6FRAC068 bearing components only. And for others inspection shall be done by agency as mentioned in PO.

राजेश किशोर राठौर/G.S. RAATHORE

प्रबंधक/Manager

उत्पादन विभाग/OTM Division
 श्री एच.के. शर्मा/H.K.E.L. BHOPAL

अभिजीत शर्मा/ABHJIT JAIN

उत्पादन विभाग/OTM Division
 श्री एच.के. शर्मा/H.K.E.L. BHOPAL

राजेश कुमार/RAJESH KUMAR

उत्पादन विभाग/OTM Division
 श्री एच.के. शर्मा/H.K.E.L. BHOPAL

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3.	Visual Inspection	Free from visual defect.	100%	100%	Visual	-	Component to be free from any abnormality such as blow hole, pin hole, dent etc.	-
4.	Identification marking	Identification marking at machining stage on the location shown in drawing or location may be taken from BHEL Engg. Dept.	100%	10%	Verification	As per relevant BHEL drawing/ specification TM12548	Identification marking as per BHEL drawing/spec. TM12548	-
5.	Paint (Visual, Dry paint thickness and Adhesion test)	Epoxy primer paint (specification AA56113) on um-machined surfaces.	100%	100%(Visual) & 10% per lot (DFT and adhesion test)	Visual and Instruments	As per relevant BHEL Drawing/ specification TM94217 (Latest Rev)	As per relevant BHEL Drawing/ specification TM94217 (Latest Rev)	Report to be submitted for- • Visual • DFT • Adhesion

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6.	Packing	Packaging suitability for transit & storage	100%	-	Visual	-	-	Each component shall be suitably packed & wrapped to avoid any damage to components during transit and ingress of water. Note: In case any damage to machined surface found during inspection at BHEL, job will be liable to be rejected.

Notes:

- 1) All test records, dimensional reports (3D CMM & MANUAL) checked & reviewed by TP, QC (dully signed & sealed) as per above QAP requirement shall be submitted along with consignment.
- 2) Final acceptance will be based on inspection at BHEL, Bhopal.
- 3) (*) Quantum of inspection shall be in line with QAP unless otherwise mentioned in the drawing.
- 4) (**) Job shall be randomly selected from offered lot, the quantum of check (min. 1 no.) from the offered lot to be checked by QC (e.g. If lot size is 2 then minimum one no is to be checked).
- 5) (***) Sample inspection of component does not mean that the supplier will not meet drawing & specification requirements in remaining components. In case any defect / non-conformance is observed at any stage (during processing or before and after fitment in any job), the same is liable to be rejected and same shall be replaced immediately by the supplier at BHEL or BHEL Customer site (wherever deficiency is observed) and necessary penal action will be taken as per BHEL norms.
- 6) Calibration records of all the measuring machines, instruments, gauges, fixtures etc. used for dimensional measurement shall be duly reviewed by BHEL/BHEL inspection agency before start of inspection.

राजेश सिंह राठौर / G.S. RATHORE
अधीक्षक / Dy. Manager

विकास कुमार / T.M.E. Division
डी.एम.ई.एल., भोपाल/BHEL, BHOPAL

अभिजीत शर्मा / ABHJIT SHARMA
अधीक्षक / Dy. Manager

विकास कुमार / T.M.E. Division
डी.एम.ई.एल., भोपाल/BHEL, BHOPAL

राजेश कुमार / RAJESH KUMAR
अधीक्षक / Sr. Manager

विकास कुमार / T.M.E. Division
डी.एम.ई.एल., भोपाल/BHEL, BHOPAL

Part II: Requirement of clearance of 1st lot from BHEL:

- 1) First lot of item shall be supplied after meeting all QAP requirements to BHEL Bhopal and supply of subsequent lots shall be undertaken only after clearance of first lot by BHEL Bhopal.
- 2) Vendor has to initiate the supplies as per PO delivery only. Delay in supply of first lot of components or rejection of components due to any non-conformity/ quality deficiency shall not be considered as reason for delay in supply of components in subsequent deliveries as per PO delivery requirement.
- 3) Initial clearance of 1st lot of items does not absolve the supplier from supply of items as per drawing and specification requirement in subsequent lots.

Meaning of Legends: '#' - Supplier to submit test certificates & reports of above mentioned parameters.

Abbreviation: T P – Task Performer (Supplier), QC – Quality Control (QIX / BHEL appointed inspection agency)

Prepared by:	Approved by:	Issued by:
<p>गजेन्द्र सिंह राठौर/G.S. RATHORE उप निदेशक/Deputy Manager बहु. टी.एम. विभाग/OTM Division बी.एस.ई.एल. भोपाल QTM</p>	<p>अभिजीत जैन/ABHIJIT JAIN उप निदेशक/Deputy Manager टी.एम. विभाग/T.M.E. Division बी.एस.ई.एल. भोपाल/OTM Division</p> <p>राजेश कुमार/RAJESH KUMAR उप निदेशक/Deputy Manager टी.एम. विभाग/T.M.E. Division बी.एस.ई.एल. भोपाल/OTM Division</p>	<p>अमित सेठी/AMIT SETHI अभि. निदेशक/Engineer बहु. टी.एम. विभाग/OTM Division बी.एस.ई.एल. भोपाल QTM</p>