
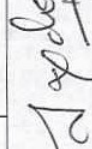


**BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL**  
**QUALITY CONTROL TRANSPORTATION**  
**QUALITY ASSURANCE PLAN (QAP)**

QA Plan for fasteners no. : QTM/TXM/VENDOR/QAP/2019-20/ Bolts REV 00 DT. 11.12.2019

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	TPIA/QC**				
1.	Melt analysis	Chemical composition	One sample per heat	100% TC to be verified	Spectrometer / Wet analysis method	As per the specification	As per the specification	TC (as per specification) to be provided to BHEL.
2.	Mechanical testing	Mechanical properties mentioned in the specification	One sample per heat per heat treatment batch	100% TC to be verified	Mechanical testing equipment	As per the specification	As per the specification	One sample (Ø 25 x 300 mm) per heat per heat treatment batch is to be verified by TPIA (for heat & heat treatment batch punched by supplier matching with test certificate reports above) and provided to BHEL for chemical & mechanical testing at BHEL works.

  
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3.	Microstructure	Hardened and tempered with no decarburisation	One sample per heat per heat treatment batch	100% TC to be verified	Metallurgical microscope	As per the specification	As per the specification	TC along with photograph of microstructure
4.	NDT testing	MPI/LPI	As per requirement mentioned in the BHEL drg. / spec.	1%	NDT equipment	As per BHEL drawing/ specification	As per BHEL drawing/ specification	NDT test report
5.	Dimensions & tolerances	<ul style="list-style-type: none"> <li>• Checking by go/no go gauge</li> <li>• Thread length, Dia., Head size etc.</li> <li>• Hole for wire locking (if applicable)</li> </ul>	5%	1%	Gauges & Instruments	As per BHEL drawing/ specification	As per BHEL drawing/ specification	Dimensional report
6.	Thread manufacturing by rolling process	Rolled/ machined	100%	-	Visual	-	Threads to be manufactured by rolling process only	Supplier to submit compliance certificate
7.	Visual Inspection	Free from visual defect	100%	1%	Visual	-	Fasteners shall be free from any surface discontinuities such as dent etc.	-

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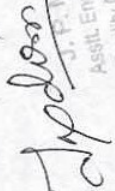
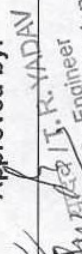
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8.	Identification marking	Vendor name Property class/grade	100%	1%	Verification	-	Embossing identification marking on bolt head	-
9.	Electroplating/ Parkerizing	-	100%	1%	Visual	As per relevant BHEL Drawing/ specification	As per relevant BHEL Drawing/ specification	-
10.	Packing	Suitable packing	100%	-	Visual	-	Packaging shall be such that during transit fasteners should not get damaged	-

**Notes:**

- 1) All test records checked by TP, TPIA/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.
- 5) Sample inspection of fasteners does not mean that the supplier will not meet drawing & specification requirements in remaining fasteners. 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).

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

**Abbreviation: TPIA -BHEL appointed third Party Inspecting Agency, TP – Task Performer (vendor), QC-QIX.**

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