

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

**QA Plan for Steel Bar H&T to BP10590**  
**QAP No : QTM/QAP/VENDOR/21-22/09 REV.00 Dt:12.01.2022**

Sl. No.	Name of the process	Parameters for inspection	Quantum of Check*		Mode of inspection/ equipment used	Drawing No./Spec./ Std.	Acceptance norms***	Requirement from supplier (See note 1)
			TP/Supplier	TPIA/QC**				
1	Melt analysis	Chemical Composition	One sample/ heat / Lot	100% TC Verification	Spectrometer / Wet analysis method	As per BHEL drawing/ specification	As per BHEL drawing/ specification	a). TC (as per specification format or supplier's format with all parameters of specification format) from NABL accredited Lab.  b) Three shafts with extended length per heat / per heat treatment batch to be punched marked on extended portion by supplier. Same to be correlated by TPIA (for heat & heat treatment batch punched by supplier matching with test certificate reports, provided against clause 1(a)). Extended portion of 3 nos. shaft per heat per heat treatment batch (correlated above) shall be duly seal marked by TPIA before parting from shaft. Extended portion of shaft (Duly seal marked by TPIA) to be supplied along with consignment.
2	Mechanical Testing	Mechanical properties mentioned in the BHEL specification/ drawing	One sample/ Heat treatment batch / Lot	100% TC Verification	Mechanical testing equipment	As per BHEL drawing/ specification	As per BHEL drawing/ specification	

गजेन्द्र सिंह रावत / Gajendra Singh Rathour  
वरिष्ठ अभियंता (क्यूएफडी) / Sr. Engineer (QFD)  
गुणता नियंत्रण-सी.आई.एम. / Quality Control-CIM  
बी.एच.ई.एल., भोपाल / BHEL, BHOPAL

राहुल टोपा / RAHUL TOPPO  
मैनेजर / Manager  
क्यूटी.एम. विभाग / QTM Division  
बी.एच.ई.एल., भोपाल / BHEL, BHOPAL

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3	Heat treatment	Soaking temperature/ soaking time	100%	100% TC Verification	Temperature recorder/ Time Temperature charts	Heat treatment requirement as per BHEL specification mentioned in the drawing	Mechanical properties as specified in the BHEL specification	Heat treatment report and graph shall be provided to BHEL
4	Hardness check	Hardness limit mentioned in the BHEL specification/ drawing	100% of components of each lot	100% of components of each lot	Hardness tester	As per BHEL drawing/ specification	As per BHEL drawing/ specification	Hardness test report shall be provided to BHEL
5	Non Destructive Tests (NDT)	Ultrasonic testing (UT) as mentioned in the BHEL drawing/ specification. Note: UT to be done before boring/ drilling operation for taper tuning.	100%	100% (To be witnessed by TPIA, Level -2 NDT certified person at vendor works)	NDT equipment	As per BHEL drawing/ specification	As per BHEL drawing/ specification	NDT report shall be provided to BHEL along with consignment.
6	Dimensions	Diameter	100%	10%	Instruments	As per relevant BHEL drawing/specification/PO	As per relevant BHEL drawing/specification /PO	Dimensional report along with shall be provided to BHEL.
		Straightness						
		length						
7	Identification marking	Identification marking by punching/ engraving on the location shown in drawing.	100%	100%	Visual	As per BHEL drawing/ specification	Identification marking as per BHEL drawing/ specification TM12548	

गजेन्द्र सिंह राठौर / Gajendra Singh Rathour  
 ज्वर, अभियंता (क्यू.एफ.डी.) / Sr. Engineer (QFD)  
 गुणता नियंत्रण-सी.आई.एम. / Quality Control-CIM  
 बी.एच.ई.एल., भोपाल / BHEL, BHOPAL

राहुल टोप्पो / RAHUL TOPPO  
 प्रबंधक / Manager  
 क्वालिटी मैनेजिंग / QTM Div  
 बी.एच.ई.एल., भोपाल / BHEL, BHOPAL

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8	Visual Inspection	Free from visual defect.	100%	100%	Visual	-	Component shall be free from any abnormality such as blow hole, pin hole, dent, scratch, seams, laps, injurious imperfection etc.	-

**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, the quantum of check (min. 1 no.) from the offered lot to be checked by TPIA or 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.

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

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

<b>Prepared by:</b> गजेन्द्र सिंह राठौर / Gajendra Singh Rathaur वरि. अभियंता (क्यू.एफ.डी.) / Sr. Engineer (QFD) गुणता नियंत्रण-सी.एच.ई.एल. / Quality Control-CIM सी.एच.ई.एल., भोपाल / BHEL, BHOPAL	<b>Approved by:</b> राहुल टोन्ड / RAHUL TOND मैनेजर / Manager गुणता विभाग / QTM Division सी.एच.ई.एल., भोपाल / BHEL, Bhopal
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