

**BIHAR STATE POWER TRANSMISSION COMPANY LIMITED**  
**MANUFACTURING QUALITY PLAN - HARDWARE FITTINGS**

		<b>Company name and address</b>		<b>CUSTOMER : BSPTCL</b>		<b>Vendor Code :</b>		<b>Item : Hardware Fittings, Conductor &amp; Earthwire Accessories</b>		<b>M.Q. P. No. 028 Rev. No. 00 Date : 05.01.2016</b>		<b>Valid From: 15.01.2016 Valid Up to: Till Revision</b>	
Sr. No.	Components / Operations & Description of Test	Type of Check	Quantum of Check / Sampling with Basis	Reference document for testing	Acceptance Norms	Format of Record	Applicable Codes						Remark
							1	2	3	4	5	6	
<b>Code 1 Indicates place where testing is planned to be performed i.e. Inspection Location.</b>				<b>Code 2 Indicates who has to perform the tests i.e. Testing Agency.</b>									
A At Equipment Manufacturer's works B At Component Manufacturer's works C At Authorized Distributor's place D At Independent Lab E At Turn Key Contractor's location F Not specified				J The Equipment Manufacturer K The Component Manufacturer L The Third Party M The Turnkey Contractor									
<b>Code 3 Indicates who shall witness the tests i.e. Witnessing Agency.</b>				<b>Code 4 Review of Test reports / Certificates</b>									
P Component Manufacture itself Q Component Manufacturer and Equipment Manufacturer R Component Manufacturer, Equipment Manufacturer and Contractor S Equipment Manufacturer itself T Equipment Manufacturer and Contractor U Equipment Manufacturer, Contractor and BSPTCL U* Equipment Manufacturer and BSPTCL V Third Party itself				W By Equipment manufacturer X By Contractor during product / process inspection Y By BSPTCL during product / process inspection Z By Contractor and / or BSPTCL during product / process inspection									
<b>Code 5 Whether specific approval of Sub- Vendor / Components make is envisaged?</b>				<b>Code 6 Whether test records to be submitted after final inspection for issuance of Dispatch Clearance/Instructions?</b>									
E Envisaged N Not Envisaged				Y Yes N No									

**NOTES:**

- The MQP should be read in conjunction with BSPTCL specification and shall deem to include additional tests if any required as per the contract.
- BSPTCL specification shall include provisions of letter of Award, BSPTCL approved drawings /technical data sheet / BOM / test schedule /test procedure applicable to the specific contract.
- In case of any contradiction between the manufacturer's plant standards, this MQP and BSPTCL specification following precedence shall be followed
  - BSPTCL Specification.

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b) This Manufacturing Quality Plan.

c) Manufacturer's Plant Standards.

4. It is the responsibility of the manufacturer to ensure that this document is readily available at their works, as well as at the works of their sub vendors in order to avoid delay at the time of inspection.

5. The manufacturer shall ensure that their as well as their sub vendors control , metering & testing instruments are duly calibrated and should have calibration certificates traceable to Indian / International standards . Calibration records should be available during inspection by BSPTCL. Key testing instruments will be calibrated only by NABL accredited laboratories.

6. In case of any tests being carried out at third party lab, such lab / facility should be NABL accredited / accepted by BSPTCL.

7. The manufacturer shall maintain the proper co-relation of test certificates from raw material stage to finished product stage and the records should be available during inspection by BSPTCL.

8. Manufacturer shall show the approval of BSPTCL Engineering for all contract specific type tests, including specific type tests if any as per the BSPTCL specification at the time of Final Inspection.

9. The packing shall be as per BSPTCL specification and have sufficient to withstand rough handling during transit, storage at site and subsequent handling in the field. All packing cases should be marked with BSPTCL LOA details, name of project, item description and Dispatch Clearance/Instructions number.  
(By which material has been cleared for dispatch).

10. One copy of test report, Dispatch Clearance/Instructions shall also be sent along with consignment.

11. All accessories shall be packed in suitable sizes of strong and weather resistant wooden cases/ creates the gross weight of packing shall not normally exceed 200kg to avoid handling problems.

12. Inspection of spare items ordered by BSPTCL shall also be governed by the provisions of this MQP. Items if not governed under MQP shall be offered for inspection as per BSPTCL specifications / Relevant-Indian / International Specification.

13. Any material rejected during BSPTCL inspection shall be disposed off with approval of BSPTCL. In case the material is to be returned to the components Manufacturer, all such items shall be indelibly marked (to prevent mixing) at the works of the manufacturer and offered to BSPTCL inspection engineer for verification of marking.

14. The manufacturer shall align their quality system and that of their sub-vendors to the requirements of latest ISO 9000 quality standards in a time bound manner.

15. The list of component manufacturers for which sub-vendor approval is envisaged is enclosed herewith.

16. Bolt, Nuts, Washers, cotter pins, security and Split Pins etc. shall be dispatched duly assembled on Hardware fittings.

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17. A separate CIP to be obtained for all bought out components such as Bolts & nuts, spring washers, security Clips / Split Pins and Rubber components as per respective IS/ MQP.

18. All bought out components/ services to be procured from BSPTCL approved vendors as per approved MQP by BSPTCL / Indian/ international Standards.

19. Welding jobs are done by qualified welders approved by BSPTCL as per approved welding procedure.

20. For 8.8 Grade bolts tyco to ensure that:

a. All tests are done as per Plan A of IS 1367 Part- III.

b. MPI Test on 100% quantity if manufacture by hot forging method.

c. Double shear test on 1% samples. The acceptance value as per the approved drawing based on actual requirement and diameter of the bolt.

21. BSPTCL may review the effective implementation of the processes during the product-inspection / process-inspection.

In case any violation in process or process parameters are observed, the reason along with corrective & preventive measures shall be conveyed to BSPTCL within 2 weeks.

22. In case of any contradiction between Technical Specification/Approved Drgs. And MQP, detailed mention in Technical Specification / Approved Drawing shall be final.

EM: Equipment Manufacturer

CM: Component Manufacturer

TC: Test Certificates

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<b>A</b>	<b>RAW MATERIAL INSPECTION</b>											
<b>I</b>	<b>ALUMINIUM CASTING (Primary Ingot)</b>											
											E	
1	Chemical Analysis of Ingot (Grade A 4600 / LM 6)	Chemical	1 Sample/Lot	IS : 617 / BSPTCL Spec.	Within Specified Limits		B	K	P	W		N
							A	J	S	W/Z		N
2	Tensile Test a. UTS b. Elongation	Mechanical	1 Sample/Heat	IS : 617 / BSPTCL Spec.	Within Specified Limits		A	J	S	W/Z		N
<b>II</b>	<b>ALUMINIUM ALLOY ROD - 6061 / 65032 Type</b>											
											E	
1	Chemical Analysis	Chemical	1 Sample/Heat/Lot	IS : 733/ 739 /ASTM-B-429/Al. Alloy 65032/6061/ BSPTCL Spec.	Within Specified Limits		B	K	P	W		N
							A	J	S	W/Z		N
2	Tensile Test a. UTS b. Elongation	Mechanical	1 Sample/Heat/Lot	IS : 733/ 739 / BSPTCL Spec.	Within Specified Limits		B	K	P	W		N
							A	J	S	W/Z		N
<b>III</b>	<b>ALUMINIUM EXTRUSION (FLATS &amp; TUBES)- 6061 / 6063/ 6060/ 6201/ 1050/ 6201 Type</b>											
											E	
1	Visual Inspection	Visual	100%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	W/Z		N
2	Chemical Analysis	Chemical	1 Sample/Lot/Heat	IS : 733 739/ 5082/ ASTM-B429/ BSPTCL Spec.	Within Specified Limits		B	K	P	W		N
							A	J	S	W/Z		N
3	Hardness Test	Physical	2 Samples/Heat/Lot	IS : 733 739/ 5082/ ASTM-B429/ BSPTCL Spec.	Within Specified Limits		B	K	P	W		N
							A	J	S	W/Z		N



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							B	K	P	W		N	
							A	J	S	W/Z		N	
2	Chemical Analysis	Chemical	1Sample/Lot/Heat	IS : 2062/1570 BSPTCL Spec.	Within Specified Limits		B	K	P	W		N	
3	Tensile Strength	Mechanical	2Samples/Lot/Heat	IS : 2062/1570 BSPTCL Spec.	Within Specified Limits		B	K	P	W		N	
4	Hardness Test	Physical	5Samples/Lot/Heat	IS : 2062 BSPTCL Spec.	120BHN min.		B	K	P	W		N	
							A	J	S	W/Z		N	
<b>VII</b>	<b>CAST IRON / MALLEABLE CAST IRON / SPHEROIDAL GRAPHITE IRON</b>												
1	Chemical Analysis	Chemical	1Sample/Lot/Heat	IS : 210/2108 BSPTCL Spec.	Within Specified Limits		B	K	P	W		N	
							A	J	S	W/Z		N	
2	Tensile Test a. UTS b. Elongation	Mechanical	1Sample/Lot/Heat	IS : 210/2108/1865 BSPTCL Spec.	Within Specified Limits		B	K	P	W		N	
3	Hardness Test	Physical	1Sample/Lot/Heat	IS : 210/2108/1865 BSPTCL Spec.	IS : 210/2108		B	K	P	W		N	
4	Magnetic Particle Inspection	N. D. T.	100%	IS : 7743/3703 BSPTCL Spec.	No Crack		B	K	P	W		N	
<b>VIII</b>	<b>ZINC</b>												
1	Purity of Zinc Slab	Chemical	1Sample/Lot	IS : 209/99.95%min./BSPTCL Spec.	Within Specified Limits		B	K	P	W		N	
							A	J	S	W/Z		N	
<b>IX</b>	<b>MESSENGER CABLE</b>												
1	Chemical Analysis	Chemical	1Sample/Lot/Heat	IS : 1835/ BSPTCL Spec.	Within Specified Limits		B	K	P	W		N	
2	Dimensional Check	Dimensional	Each Coil	BSPTCL Spec. /Approved Drawing	Within tolerance Limits		B	K	P	W		N	

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3	Tensile Test a. UTS b. Elongation	Mechanical	2Samples/Lot/ Heat	IS : 2141/ Aprpd. Drg./ BSPTCL Spec.	Within Specified Limits		B	K	P	W		N	
4	Visual Inspection	Visual	100%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	W /Z		N	
5	Dimensional Verification & Lay Ratio Check	Measurement	Each Spool	BSPTCL Spec. /Aprpd. Drgs.	Within Specified Limits		B	K	P	W		N	
6	Preforming, Postforming of strands	Visual	100%	BSPTCL Spec.	No spreading of strands when cut.		B	K	P	W		N	
7	Galvanizing Test												
	a. Visual Examination	Visual	1 %	BSPTCL Spec.	BSPTCL Spec.		B	K	P	W		N	
	b. Uniformity of Zn coating	Chemical	1 %	IS 2633/4826 BSPTCL Spec.	Min. 3&1/2 dips								
	c. Mass of Zinc Coating	Chemical	1 %	IS 4826/ BSPTCL Spec.	235 g/m <sup>2</sup> min. / 33microns		A	J	S	W /Z		N	
	d. Adhesion test		1 %	IS 2629/ BSPTCL Spec.	No Peel Off								
<b>X</b>	<b>SECURITY CLIP</b>										E		
1	Visual Inspection	Visual	100%	IS 2486/IEC 372/ BSPTCL Spec	IS 2486/IEC 372 / BSPTCL Spec		B	K	U*	W /Z		N	
2	Dimensional Verification	Measurement	IS 2486	IS 2486/IEC 372/ BSPTCL Spec	Within Specified Limits		B	K	U*	W /Z		N	
3	Resistance To Bending	Visual	IS 2486	IS 2486/IEC 372/ BSPTCL Spec	No Crack		B	K	U*	W /Z		N	
4	Operation / Load Test	Mechanical	IS 2486	IS 2486/IEC 372/ BSPTCL Spec	5- 50Kg		B	K	U*	W /Z		N	
5	Hardness Test	Physical	IS 2486	IS 2486/IEC 372/ BSPTCL Spec	152BHN min.		B	K	U*	W /Z		N	
6	Resistance to Internal Corrosion (Copper & Cu Alloy)		IS 2486	IS 2486/IEC 372/ BSPTCL Spec	IS 2486/IEC 372 / BSPTCL Spec		B	K	U*	W /Z		N	
7	Chemical Analysis	Chemical	IS 2486	IS 2486/IEC 372/ BSPTCL Spec	Within Specified limit		B	K	U*	W /Z		N	

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8	Inter Granular Corrosion Test	Chemical	Once / Order	ASTM – A262 Practice A	ASTM – A262 / No Crack		B	K	U*	W /Z		N	
<b>XI</b>	<b>SPLIT PIN</b>												
1	Visual Inspection	Visual	100%	IS 549 / BSPTCL Spec	IS 549 / BSPTCL Spec		B	K	P	W		N	
2	Dimensional Verification	Measurement	IS 8563	IS 549 / BSPTCL Spec	Within Specified Limits		B	K	P	W		N	
3	Bend Test	Visual	IS 8563	IS 549 / BSPTCL Spec	No Crack		B	K	P	W		N	
<b>XII</b>	<b>SPRING WASHER</b>												
1	Visual Inspection	Visual	100%	IS 3063 / BSPTCL Spec	IS 3063 / BSPTCL Spec		B	K	U*	W /Z		N	
2	Dimensional Verification	Measurement	IS 6821	IS 3063 / BSPTCL Spec	Within Specified Limits		B	K	U*	W /Z		N	
3	Twist Test	Visual	IS 6821	IS 3063 / BSPTCL Spec	No Crack		B	K	U*	W /Z		N	
4	Permanent Set Test	Mechanical	IS 6821	IS 3063 / BSPTCL Spec	IS 3063 / BSPTCL Spec		B	K	U*	W /Z		N	
5	Permanent Load Test	Mechanical	IS 6821	IS 3063 / BSPTCL Spec	IS 3063 / BSPTCL Spec		B	K	U*	W /Z		N	
6	Hardness Test	Physical	IS 6821	IS 3063 / BSPTCL Spec	IS 3063 / BSPTCL Spec		B	K	U*	W /Z		N	
7	Chemical Analysis	Chemical	IS 6821	IS 3063 / BSPTCL Spec	Within Specified Limits		B	K	U*	W /Z		N	
8	Galvanizing Test												
	Uniformity of Zn coating	Chemical	IS 6821	IS 2633/ BSPTCL Spec.	IS 3063 / BSPTCL Spec		B	K	U*	W /Z		N	
	Mass of Zinc Coating	Chemical	IS 6821	IS 4759/6745/ BSPTCL Spec.	IS 3063 / BSPTCL Spec		B	K	U*	W /Z		N	
<b>XIII</b>	<b>RUBBER COMPOUND</b>												
1	Tensile Test (Before & after Aging)	Mechanical	1 Sample/Lot	ASTM D 1171/ ASTM D 573/ BSPTCL Spec.	Within Specified Limits		B	K	U*	W /Z		N	

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2	Elongation Test (Before & after Aging)	Mechanical	1Sample/Lot	ASTM D 1171/ ASTM D 573/ BSPTCL Spec.	Within Specified Limits		B	K	U*	W /Z		N	
3	Shore Hardness Test (Before & after Aging)	Physical	1Sample/Lot	ASTM D 1171/ ASTM D 573/ BSPTCL Spec.	65 – 80 Shore A		B	K	U*	W /Z		N	
4	Aging Test	Physical	1Sample/Lot	ASTM D 1171/ ASTM D 573/ BSPTCL Spec.			B	K	U*	W /Z		N	
<b>XIV</b>	<b>ELASTOMER BUSH</b>												
1	Tensile Test	Mechanical	1Sample/Lot	ASTM 412 C/ BSPTCL Spec.	Within Specified Limits		B	K	P	W		N	
2	Elongation Test	Mechanical	1Sample/Lot	ASTM 412 C/ BSPTCL Spec.	Within Specified Limits		B	K	P	W		N	
3	Shore Hardness Test	Physical	1Sample/Lot	ASTM D 2240/ BSPTCL Spec.	55 ± 5 Shore A		B	K	P	W		N	
<b>XV</b>	<b>BELLEVILLE WASHER</b>												
1	Visual Inspection	Visual	100%	DAMP Spec.	DAMP Spec.		A	J	S	W /Z		N	
2	Dimensional Verification	Measurement	1%	DAMP Spec.	Within Specified Limits		A	J	S	W /Z		N	
3	External & Internal Diameter	Measurement	1%	DAMP Spec.	Within Specified Limits		A	J	S	W /Z		N	
4	Thickness Control	Measurement	1%	DAMP Spec.	Within Specified Limits		A	J	S	W /Z		N	
5	Height Control	Measurement	1%	DAMP Spec.	Within Specified Limits		A	J	S	W /Z		N	
6	Verification of Force to Flattening & height Recovery	Measurement	1%	DAMP Spec.	Within Specified Limits		A	J	S	W /Z		N	
7	Chemical Analysis	Chemical	1Sample/Lot	DAMP Spec.	Within Specified Limits		B	K	P	W		N	
8	Galvanizing Test												
	Uniformity of Zn coating	Chemical	1%	DAMP Spec.	DAMP Spec.		A	J	S	W /Z		N	

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	Mass of Zinc Coating	Chemical	1%	DAMP Spec.	DAMP Spec.		A	J	S	W/Z		N	
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<b>XVI</b>	<b>BOLT &amp; NUT</b>												
												E	
1	Visual Inspection	Visual	100%	IS 3063 / BSPTCL Spec	IS 3063 / BSPTCL Spec		B	K	U*	W/Z		N	
2	Dimensional Verification	Measurement	IS 2614	IS 2614	Within Specified Limits		B	K	U*	W/Z		N	
3	Tensile Test a. Tensile Strength b. Yield Strength c. Elongation	Mechanical	1Sample/Size/Heat	IS : 1367 (Part III)	Within Specified Limits		B	K	U*	W/Z		N	
4	Hardness Test	Physical	IS 2614	IS 1367 (Part III) -Bolt / IS 1367 (Part VI)- Nut	Within Specified Limits		B	K	U*	W/Z		N	
5	Impact Test	Mechanical	1Sample/Size	IS : 1367 (Part III)	Within Specified Limits		B	K	U*	W/Z		N	
6	Proof Load Test - Nut	Mechanical	1Sample/Size/Heat	IS : 1367 (Part VI)	Within Specified Limits		B	K	U*	W/Z		N	
7	Chemical Analysis	Chemical	1Sample/Lot	IS 1367 (Part III) -Bolt / IS 1367 (Part VI)- Nut	Within Specified Limits		B	K	U*	W/Z		N	
8	Galvanizing Test												
	Uniformity of Zn coating	Chemical	10Samples/Lot/Size	IS 2633/BSPTCL Spec.	Min. 4dips		B	K	U*	W/Z		N	
	Mass of Zinc Coating	Chemical	10Samples/Lot/Size	IS 4759/6745/BSPTCL Spec.	305g/m <sup>2</sup> min. / 43microns		B	K	U*	W/Z		N	

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<b>B</b>	<b>INPROCESS INSPECTION</b>											
<b>I</b>	<b>ALUMINIUM CASTINGS</b>											
1	Visual Inspection	Visual	100%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	W		N
2	D. P. Test	N.D.T.	1%	Approved Drgs.	No Cracks		A	J	S	W		N
3	Check for Blow Holes	Visual	1 %	BSPTCL Spec.	No Holes		A	J	S	W		N
<b>II</b>	<b>ALUMINIUM ALLOY ROD / P. A. ROD / RETAINING ROD - 6061 / 65032 Type</b>											
1	Visual Inspection	Visual	100%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	W		N
2	Surface Finish & Center Marking	Measurement	100%	BSPTCL Spec. / Apprd. Drgs. / IS 2121	Within Specified Limits		A	J	S	W		N
3	Tensile Strength Test	Mechanical	1Sample/Lot/Heat	Approved Drgs. / IS 2121	Min. 35kg/mm <sup>2</sup>		A	J	S	W		N
4	Conductivity Test	Electrical	1Sample/Lot/Heat	Approved Drgs. / IS 2121	Min. 40% of IACS		A	J	S	W		N
5	Resilience Test	Visual	1Sample/Lot/Heat	Approved Drgs. / IS 2121	No Deformation		A	J	S	W		N
6	Bend Test	Visual	1Sample/Lot/Heat	Approved Drgs. / IS 2121	No Crack		A	J	S	W		N
<b>III</b>	<b>ALUMINIUM EXTRUSION (FLATS &amp; TUBES)- 6061 / 6063/ 6060/ 6201/ 1050/ 6201 Type</b>											
1	Visual Inspection	Visual	100%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	W		N
2	Dimensional Verification	Measurement	3%	BSPTCL Spec. / Apprd. Drgs.	Within Specified Limits		A	J	S	W		N
3	D. P. Test (Welded Joints)	N.D.T.	2%	BSPTCL Spec. / Apprd. Drgs.	No Cracks		A	J	S	W		N
<b>IV</b>	<b>ALUMINIUM FORGING</b>											
1	Visual Inspection	Visual	100%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	W		N
2	Dimensional Verification	Measurement	5%	Approved Drgs. / IS 733/ Al. Alloy 6061	Within Specified Limits		A	J	S	W		N
<b>V</b>	<b>STEEL FORGING (LOW &amp; MEDIUM CARBON STEEL - CL IV / II)</b>											
1	Visual Inspection	Visual	100%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	W		N

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Sr. No.	Components / Operations & Description of Test	Type of Check	Quantum of Check / Sampling with Basis	Reference document for testing	Acceptance Norms	Format of Record	Applicable Codes						Remark
							1	2	3	4	5	6	

2	Dimensional Verification	Measurement	10%	Approved Drgs.	Within Specified Limits		A	J	S	W		N	
3	Tensile Test	Mechanical	1%	IS : 1608/2004 BSPTCL Spec. /Aprpd. Drg.	Within Specified Limits		A	J	S	W		N	
	b. Proof load (Routine Test)		100%										
4	Galvanizing Test												
	a. Acid Concentration	Chemical	Once in a Day	IS 2629/ BSPTCL Spec.	Within specified limit		A	J	S	W		N	
	b. Pickling Time		Once in a Day	IS 2629/ BSPTCL Spec.	10 – 25min.		A	J	S	W		N	
	c. Temp. of Bath		2Batches/Day	IS 2629/ BSPTCL Spec.	450°C ± 10		A	J	S	W		N	
	d. Dipping Time		2Batches/Day	IS 2629/ BSPTCL Spec.	180Sec. Min.		A	J	S	W		N	
	e. Purity of Zn in Bath	Chemical	Once in a Month	98.5% min./IS 209/ BSPTCL Specification	Within specified limit		A	J	S	W		N	
	f. Visual Examination	Visual	1%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	W		N	
	g. Uniformity of Zn coating	Chemical	1%	IS 2633/ BSPTCL Spec.	Min. 6dips		A	J	S	W		N	
	h. Mass of Zinc Coating	Chemical	1%	IS 4759/6745/ BSPTCL Spec.	610g/m <sup>2</sup> min. / 86microns		A	J	S	W		N	
	i. Adhesion test		1%	IS 2629/ BSPTCL Spec.	No Peel Off		A	J	S	W		N	
<b>VI</b>	<b>M. S. FABRICATION</b>												
1	Visual Inspection	Visual	100%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	W		N	
2	Dimensional Verification	Measurement	10%	BSPTCL Spec. /Aprpd. Drgs.	Within Specified Limits		A	J	S	W		N	
3	MPI Test on Steel Sleeve	N. D. T.	100%	BSPTCL Spec. /IS 7743/3703	No Crack		A	J	S	W		N	
4	D.P. test on Welded Joint	N. D. T.	10%	BSPTCL Spec. /Aprpd. Drwg.	No Crack		A	J	S	W		N	
5	Magna Flux Test for Yoke Plates	Physical	3Samples/Lot/ Heat	IS : 7743	No Crack		A	J	S	W		N	

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6	Galvanizing Test												
	a. Acid Concentration	Chemical	Once in a Day	IS 2629/ BSPTCL Spec.	Within specified limit		A	J	S	W		N	
	b. Pickling Time		Once in a Day	IS 2629/ BSPTCL Spec.	10 – 25min.		A	J	S	W		N	
	c. Temp. of Bath		2Batches/Day	IS 2629/ BSPTCL Spec.	450°C ± 10		A	J	S	W		N	
	d. Dipping Time		2Batches/Day	IS 2629/ BSPTCL Spec.	180Sec. Min.		A	J	S	W		N	
	e. Purity of Zn in Bath	Chemical	Once in a Month	98.5% min./IS 209/ BSPTCL Specification	Within specified limit		A	J	S	W		N	
	f. Visual Examination	Visual	1%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	W		N	
	g. Uniformity of Zn coating	Chemical	1%	IS 2633/ BSPTCL Spec.	Min. 6dips		A	J	S	W		N	
	h. Mass of Zinc Coating	Chemical	1%	IS 4759/6745/ BSPTCL Spec.	610g/m <sup>2</sup> min. / 86microns		A	J	S	W		N	
	i. Adhesion test		1%	IS 2629/ BSPTCL Spec.	No Peel Off		A	J	S	W		N	

<b>VII CAST IRON / MALLEABLE CAST IRON / SPHEROIDAL GRAPHITE IRON</b>													
1	Visual Inspection	Visual	100%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	W		N	
2	Dimensional Verification	Measurement	5%	BSPTCL Spec. /Apprd. Drwg.	Within Specified Limits		A	J	S	W		N	
3	Galvanizing Test												
	a. Acid Concentration	Chemical	Once in a Day	IS 2629/ BSPTCL Spec.	Within specified limit		A	J	S	W		N	
	b. Pickling Time		Once in a Day	IS 2629/ BSPTCL Spec.	10 – 25min.		A	J	S	W		N	
	c. Temp. of Bath		2Batches/Day	IS 2629/ BSPTCL Spec.	450°C ± 10		A	J	S	W		N	
	d. Dipping Time		2Batches/Day	IS 2629/ BSPTCL Spec.	180Sec. Min.		A	J	S	W		N	

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							1	2	3	4	5	6	

	e. Purity of Zn in Bath	Chemical	Once in a Month	98.5% min./IS 209/ BSPTCL Specification	Within specified limit		A	J	S	W		N	
	f. Visual Examination	Visual	1%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	W		N	
	g. Uniformity of Zn coating	Chemical	1%	IS 2633/ BSPTCL Spec.	Min. 6dips		A	J	S	W		N	
	h. Mass of Zinc Coating	Chemical	1%	IS 4759/6745/ BSPTCL Spec.	610g/m <sup>2</sup> min. / 86microns		A	J	S	W		N	
	i. Adhesion test		1%	IS 2629/ BSPTCL Spec.	No Peel Off		A	J	S	W		N	

<b>C</b>	<b>FINAL INSPECTION</b>												
	<b>HARDWARE FITTING, CONDUCTOR AND EARTHWIRE ACCESSORIES</b>												
1	Visual Inspection	Visual	100%	Relevant IS / BSPTCL Spec.	BSPTCL Spec.		A	J	S	Z		N	
2	Dimensional Verification & Gauge Check	Measurement	5Samples/Lot	App. Drg./ BSPTCL Spec.	Within Specified Limits		A	J	S	Z		N	
3	Galvanizing Test												
	Visual Examination	Visual	100%	BSPTCL Spec.	BSPTCL Spec.		A	J	S	Z		N	
	Uniformity of Zn Coating	Chemical	2Samples/Lot	IS 2633/4826 BSPTCL Spec.	Min. 6dips		A	J	S	Z		N	
	Wt. Of Zinc Coating	Chemical	2Samples/Lot	IS 4759/6745/ BSPTCL Spec.	610g/m <sup>2</sup> min. / 86microns		A	J	S	Z		N	
	Adhesion Test	Chemical	2Samples/Lot	IS 2629/ BSPTCL Spec.	No Peel Off		A	J	S	Z		N	

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							1	2	3	4	5	6	

4	Mechanical Strength Test on welded Joints	Mechanical	5Samples/Lot	BSPTCL Spec. Apprd. Drwg.	20KN Min. / Apprd. Drwg.		A	J	S	Z		N	
5	MPI (on forged items after stripping of galvanizing)	N. D. T.	5Samples/Lot	IS 7743/ 3703/ BSPTCL spec.	No Crack		A	J	S	Z		N	
6	D.P. Test on Welded Joints	N. D. T.	5Samples/Lot	BSPTCL spec.	No Crack		A	J	S	Z		N	
7	D.P. Test / Blow hole Check for Aluminium Casting / Forging	N. D. T.	5Samples/Lot	BSPTCL spec.	No Crack/ No Holes		A	J	S	Z		N	
8	Chemical Analysis (Forging, Casting, Accessories except Copper Bond)	Chemical	1Sample/ Type	Relevant IS / BSPTCL Spec.	Within Specified Limits		A	J	S	Z		N	
9	Metallurgical Test		1Sample/ Type	BSPTCL Spec. IS 4163/4748/ 2853			A	J	S	Z		N	
	a. Grain Size	Metallurgical			Min. 6								
	b. Inclusion Rating	Metallurgical			Max. 2 Thick								
	c. Grain Flow	Metallurgical			Uniform/Grain flow typical of forging								
	d. Hardness	Physical			Min. 175BHN- CI-IV Min. 120BHN- CI-II								

<b>I TENSION AND SUSPENSION HARDWARE FITTING</b>													
1	Mechanical Test on individual Components (Except C.C. Ring & Arcing Horn)	Mechanical	2Samples/Lot	Apprd. Drwg./ BSPTCL Spec.	Withstand Specified Load/ Apprd. Drwg.		A	J	S	Z		N	
2	Mechanical Test on C.C. Ring & Arcing Horn	Mechanical	1Sample/Lot	BS 3288/ IS 2486 / BSPTCL Spec.	1.5KN / Apprd. Drwg.		A	J	S	Z		N	
3	Test on Locking Devices	Mechanical	5Samples/Lot	IS 2486 /IEC 372	IEC 372/BSPTCL Spec. /5-50Kgs		A	J	S	Z		N	
4	Shore Hardness Test for Elastomer	Physical	5Samples/Lot	BSPTCL Spec.	65 – 80 Shore A		A	J	S	Z		N	

**BIHAR STATE POWER TRANSMISSION COMPANY LIMITED**  
**MANUFACTURING QUALITY PLAN - HARDWARE FITTINGS**

	<b>Company name and address</b>		<b>CUSTOMER : BSPTCL</b>		<b>Vendor Code :</b>		<b>Item : Hardware Fittings, Conductor &amp; Earthwire Accessories</b>		<b>M.Q. P. No. 028 Rev. No. 00 Date : 05.01.2016</b>		<b>Valid From: 15.01.2016 Valid Up to: Till Revision</b>			
Sr. No.	Components / Operations & Description of Test	Type of Check	Quantum of Check / Sampling with Basis	Reference document for testing	Acceptance Norms	Format of Record	Applicable Codes						Remark	
							1	2	3	4	5	6		

5	Bend Test for P A Rod		2Samples/Lot	BSPTCL Spec. / IS 2121	No Deformation		A	J	S	Z		N	
6	Resilience Test for P A Rod		2Samples/Lot	BSPTCL Spec. / IS 2121	No Loosening.		A	J	S	Z		N	
7	Conductivity Test for P A Rod	Electrical	2Samples/Lot	BSPTCL Spec. / IS 2121	40% of IACS min.		A	J	S	Z		N	
8	UTS of P A Rod	Mechanical	2Samples/Lot	BSPTCL Spec. / IS 2121	Min. 35Kg/mm <sup>2</sup>		A	J	S	Z		N	
9	Lay check of PA Rod / Pitch Test	Measurement	2Samples/Lot		Right Hand		A	J	S	Z		N	
10	Clamp Slip Strength Test Vs Torque Test	Mechanical	2Samples/Lot	BSPTCL Spec. / IS 2121/2486	Apprd. Drwg.		A	J	S	Z		N	
11	Slip Strength Test for Dead End Assembly	Mechanical	1Sample/Lot	BSPTCL Spec. / IS 2121/2486	Apprd. Drwg./95% UTS of cond.		A	J	S	Z		N	

**II CONDUCTOR & EARTHWIRE ACCESSORIES**

**i VIBRATION DAMPER**

1	Verification of Resonance Frequency	Mechanical	5Samples / Lot	IS 9708 / BSPTCL Spec.	BSPTCL Spec. / Apprd. Drwg.		A	J	S	Z		N	
2	Clamp Slip Test	Mechanical	5Samples / Lot	IS 9708 / BSPTCL Spec.	BSPTCL Spec. / Apprd. Drwg. / 2.5 KN – 5 KN		A	J	S	Z		N	
3	Clamp Bolt Torque Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 9708. 150% of Specified Torque	No Damage / Failure to Damper Component / Conductor or E/W.		A	J	S	Z		N	
4	UTS of Messenger Cable	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 9708.	135 Kg/mm <sup>2</sup> Min.		A	J	S	Z		N	
5	Mass Pull Off Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 9708.	Apprd. Drwg.		A	J	S	Z		N	

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6	Lay Ratio / No of strands for Messenger Cable	Mechanical	5Samples / Lot	BSPTCL Spec. / Apprd. Drwg.	Apprd. Drwg.		A	J	S	Z		N	
7	Dynamic Characteristics Test	Vibration	1Sample/ Lot	IS 9708 / BSPTCL Spec.	BSPTCL Spec.		A	J	S	Z		N	

**ii FLEXIBLE COPPER BOND**

1	Flexibility test	Visual	2Samples / Lot	BSPTCL Spec.	BSPTCL Spec		A	J	S	Z		N	
2	Strand & Stranding Checking	Visual	1Sample / Lot	BSPTCL Spec.	259 wires of 0.417 mm Dia., 7 stranded ropes each of 37 bunched wires		A	J	S	Z		N	
3	Slip Strength Test	Mechanical	2Samples / Lot	BSPTCL Spec. / Apprd. Drwg.	3 KN Min.		A	J	S	Z		N	
4	Resistance Test	Electrical	2Samples / Lot	BSPTCL Spec. / Apprd. Drwg.	0.00140Ohm Max.		A	J	S	Z		N	

**iii SUSPENSION / TENSION CLAMP FOR EARTHWIRE**

1	Mechanical Strength Test on each component excluding Tension Clamp	Mechanical	2Samples / Lot	BSPTCL Spec. / Apprd. Drwg.	Withstand Specified Load/ Apprd. Drwg.		A	J	S	Z		N	
2	Slip Strength Test of Tension Clamp	Mechanical	2Samples / Lot	BSPTCL Spec. / IS 2121	Apprd. Drwg./95% UTS of E/W.		A	J	S	Z		N	
3	Slip Strength Test on Suspension Clamp	Mechanical	2Samples / Lot	BSPTCL Spec. / Apprd. Drwg.	Apprd. Drwg. / 12 to 17 KN		A	J	S	Z		N	
4	Breaking Strength Test on Suspension Clamp	Mechanical	2Samples / Lot	BSPTCL Spec. / Apprd. Drwg.	Apprd. Drwg./25KN Min.		A	J	S	Z		N	
5	Hardness Test on Steel Sleeve	Physical	2Samples / Lot	BSPTCL Spec. / IS2121	120 to 160BHN		A	J	S	Z		N	

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							1	2	3	4	5	6	

	<b>Company name and address</b>	<b>CUSTOMER : BSPTCL</b>	<b>Vendor Code :</b>	<b>Item : Hardware Fittings, Conductor &amp; Earthwire Accessories</b>	<b>M.Q. P. No. 028 Rev. No. 00 Date : 05.01.2016</b>	<b>Valid From: 15.01.2016 Valid Up to: Till Revision</b>					
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**iv MIDSPAN COMPRESSION JOINT / REPAIR SLEEVE / T-CONNECTOR**

1	Hardness Test on Steel Sleeve	Physical	2Samples / Lot	BSPTCL Spec. / IS 2121	120 to 160BHN.		A	J	S	Z		N	
2	Slip Strength Test On Midspan Compression Joint	Mechanical	1Sample / Lot	BSPTCL Spec. / IS 2121	Apprd. Drwg./ Min. 95% UTS of Cond. or E/W.		A	J	S	Z		N	
3	Axial Tensile Load Test on T connector	Mechanical	1Sample / Lot	BSPTCL Spec. / IS 2121	Min. 30 KN		A	J	S	Z		N	

**v RIGID SPACER**

1	Compression & Tension Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 10162	BSPTCL Spec. / Apprd. Drwg.		A	J	S	Z		N	
2	Clamp Slip Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 10162	2.5 KN – 5 KN / Apprd. Drwg.		A	J	S	Z		N	
3	Clamp Bolt Torque Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 10162	150 % of Specified Torque. / Apprd. Drg.		A	J	S	Z		N	
4	Assembly Torque Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 10162	Apprd. Drwg.		A	J	S	Z		N	

**vi BUNDLE SPACER**

1	Compression & Tension Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 10162	BSPTCL Spec. / Apprd. Drwg.		A	J	S	Z		N	
2	Movement Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 10162	BSPTCL Spec. / Apprd. Drwg.		A	J	S	Z		N	
3	Shore Hardness Test (Rubber Compound)	Physical	5Samples / Lot	BSPTCL Spec.	65 – 80 Shore A		A	J	S	Z		N	
4	UTS of Retaining Rod	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 2121	Min. 35Kg/mm <sup>2</sup>		A	J	S	Z		N	
5	Conductivity Test for Retaining Rod	Electrical	5Samples / Lot	BSPTCL Spec. / IS 2121	40% of IACS min.		A	J	S	Z		N	
6	Clamp Slip Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 10162	2.5 KN – 5 KN. / Apprd. Drwg.		A	J	S	Z		N	

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<b>vii</b>	<b>SPACER DAMPER</b>												
1	Compression & Tension Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 10162	BSPTCL Spec. / Apprd. Drwg.		A	J	S	Z			N
2	Movement Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 10162	BSPTCL Spec. / Apprd. Drwg.		A	J	S	Z			N
3	Shore Hardness Test (Rubber Compound)	Physical	5Samples / Lot	BSPTCL Spec. / Apprd. Drwg.	55 ± 5 Shore A		A	J	S	Z			N
6	Clamp Slip Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 10162	2.5 KN – 5 KN. / Apprd. Drwg.		A	J	S	Z			N
3	Clamp Bolt Torque Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 10162	150 % of Specified Torque. / Apprd. Drg.		A	J	S	Z			N
4	Assembly Torque Test	Mechanical	5Samples / Lot	BSPTCL Spec. / IS 10162	Apprd. Drwg. / 40 N-M		A	J	S	Z			N

<b>D</b>	<b>ACCEPTANCE TESTING</b>												
	<b>HARDWARE FITTING, CONDUCTOR AND EARTHWIRE ACCESSORIES</b>												
1	Visual Inspection	Visual	1% of offered Lot	Relevant IS / BSPTCL Spec.	BSPTCL Spec.		A	J	U	W/ Z			Y
2	Dimensional Verification & Gauge Check	Measurement	1% of offered Lot	App. Drg./ BSPTCL Spec.	Within Specified Limits		A	J	U	W/ Z			Y
3	Galvanizing Test												
	Visual Examination	Visual	100%	BSPTCL Spec.	BSPTCL Spec.		A	J	U	W/ Z			Y
	Uniformity of Zn Coating	Chemical	2Samples/Lot of 500Nos.	IS 2633/4826 BSPTCL Spec.	Min. 6dips		A	J	U	W/ Z			Y

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	Wt. Of Zinc Coating	Chemical	2Samples/Lot of 500Nos.	IS 4759/6745/ BSPTCL Spec.	610g/m <sup>2</sup> min. / 86microns		A	J	U	W/ Z		Y	
	Adhesion Test	Chemical	2Samples/Lot of 500Nos.	IS 2629/ BSPTCL Spec.	No Peel Off		A	J	U	W/ Z		Y	
4	Chemical Analysis (Forging, Casting, Accessories except Copper Bond)	Chemical	1Sample of each type/Heat/lot	Relevant IS / BSPTCL Spec.	Within Specified Limits		A	J	U	W/ Z		Y	
5	Mechanical Strength Test on welded Joints	Mechanical	1% of offered Lot	BSPTCL Spec. Apprd. Drwg.	20KN Min. / Apprd. Drwg.		A	J	U	W/ Z		Y	
6	Proof Load Test for Steel Forging	Mechanical	1% of offered Lot	67% of UTS for one min. / BSPTCL Spec.	Apprd. Drwg. / BSPTCL Spec.		A	J	U	W/ Z		Y	
7	MPI (on forged items after stripping of galvanizing)	N. D. T.	1% of offered Lot	IS 7743/ 3703/ BSPTCL spec.	No Crack		A	J	U	W/ Z		Y	
8	D.P. Test on Welded Joints	N. D. T.	1% of offered Lot	BSPTCL spec.	No Crack		A	J	U	W/ Z		Y	
9	D.P. Test / Blow hole Check for Aluminium Casting / Forging	N. D. T.	1% of offered Lot	BSPTCL spec.	No Crack/ No Holes		A	J	U	W/ Z		Y	
10	Metallurgical Test		1Sample of each type	BSPTCL Spec. IS 4163/4748/ 2853			A	J	U	W/ Z		Y	
	a. Grain Size	Metallurgical			Min. 6								
	b. Inclusion Rating	Metallurgical			Max. 2 Thick								
	c. Grain Flow	Metallurgical			Uniform/Grain flow typical of forging								
	d. Hardness	Physical			Min. 175BHN- CI-IV Min. 120BHN- CI-II								

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							1	2	3	4	5	6	

<b>I TENSION AND SUSPENSION HARDWARE FITTING</b>												
1	Mechanical Test on individual Components (Except C.C. Ring & Arcing Horn)	Mechanical	2Samples/Lot of 500Nos.	Apprd. Drwg./ BSPTCL Spec.	Withstand Specified Load/ Apprd. Drwg.		A	J	U	W/Z		Y
2	Mechanical Test on C.C. Ring & Arcing Horn	Mechanical	1Sample/Lot of 500Nos.	BS 3288/ IS 2486 / BSPTCL Spec.	1.5KN / Apprd. Drwg.		A	J	U	W/Z		Y
3	Test on Locking Devices	Mechanical	IS 2486 /IEC 372	IS 2486 /IEC 372	IEC 372/BSPTCL Spec. /5-50Kgs		A	J	U	W/Z		Y
4	Shore Hardness Test for Elastomer	Physical	2% of offered Lot	BSPTCL Spec.	65 – 80 Shore A		A	J	U	W/Z		Y
5	Bend Test for P A Rod		2Samples/Lot	BSPTCL Spec. / IS 2121	No Deformation		A	J	U	W/Z		Y
6	Resilience Test for P A Rod		2Samples/Lot	BSPTCL Spec. / IS 2121	No Loosening.		A	J	U	W/Z		Y
7	Conductivity Test for P A Rod	Electrical	IS 2121	BSPTCL Spec. / IS 2121	40% of IACS min.		A	J	U	W/Z		Y
8	UTS of P A Rod	Mechanical	IS 2121	BSPTCL Spec. / IS 2121	Min. 35Kg/mm <sup>2</sup>		A	J	U	W/Z		Y
9	Lay check of PA Rod / Pitch Test	Measurement	2Samples/Lot		Right Hand		A	J	U	W/Z		Y
10	Dimension check of PA Rod	Measurement	IS 2121	Apprd Drg. / IS 2121	Within Specified Limits		A	J	U	W/Z		Y
11	Clamp Slip Strength Test Vs Torque Test	Mechanical	2Samples/Lot of 500Nos.	BSPTCL Spec. / IS 2121/2486	Apprd. Drwg.		A	J	U	W/Z		Y
12	Slip Strength Test for Dead End Assembly	Mechanical	1Sample/Lot of 500Nos.	BSPTCL Spec. / IS 2121/2486	Apprd. Drwg./95% UTS of cond.		A	J	U	W/Z		Y

**BIHAR STATE POWER TRANSMISSION COMPANY LIMITED**  
**MANUFACTURING QUALITY PLAN - HARDWARE FITTINGS**

		<b>Company name and address</b>		<b>CUSTOMER : BSPTCL</b>		<b>Vendor Code :</b>		<b>Item : Hardware Fittings, Conductor &amp; Earthwire Accessories</b>		<b>M.Q. P. No. 028 Rev. No. 00 Date : 05.01.2016</b>		<b>Valid From: 15.01.2016 Valid Up to: Till Revision</b>	
Sr. No.	Components / Operations & Description of Test	Type of Check	Quantum of Check / Sampling with Basis	Reference document for testing	Acceptance Norms	Format of Record	Applicable Codes						Remark
							1	2	3	4	5	6	

<b>II CONDUCTOR &amp; EARTHWIRE ACCESSORIES</b>													
<b>i VIBRATION DAMPER</b>													
1	Verification of Resonance Frequency	Mechanical	2 Samples / 500 Nos. or Part of thereof	IS 9708 / BSPTCL Spec.	BSPTCL Spec. / Apprd. Drwg.		A	J	U	W/ Z		Y	
2	Clamp Slip Test	Mechanical	2 Samples / 500 Nos. or Part of thereof	IS 9708 / BSPTCL Spec.	BSPTCL Spec. / Apprd. Drwg. / 2.5 KN – 5 KN		A	J	U	W/ Z		Y	
3	Dynamic Characteristics Test	Vibration	1 Sample / 1000 Nos. 3 Samples above 1000 & up to 5000 Nos. / Additional 1 Sample for every additional 1500 Nos. above 5000 Nos.	IS 9708 / BSPTCL Spec.	BSPTCL Spec.		A	J	U	W/ Z		Y	
4	Clamp Bolt Torque Test	Mechanical	2 Samples / 500 Nos. or Part of thereof	BSPTCL Spec. / IS 9708. 150% of Specified Torque	No Damage / Failure to Damper Component / Conductor or E/W.		A	J	U	W/ Z		Y	
5	UTS of Messenger Cable	Mechanical	2 Samples / 500 Nos. or Part of thereof	BSPTCL Spec. / IS 9708.	135 Kg/mm <sup>2</sup> Min.		A	J	U	W/ Z		Y	
6	Mass Pull Off Test	Mechanical	2 Samples / 500 Nos. or Part of thereof	BSPTCL Spec. / IS 9708.	Apprd. Drwg.		A	J	U	W/ Z		Y	
7	Lay Ratio / No of strands for Messenger Cable	Mechanical	2Samples/Lot of 500Nos.	BSPTCL Spec. / Apprd. Drwg.	Apprd. Drwg.		A	J	U	W/ Z		Y	
<b>ii FLEXIBLE COPPER BOND</b>													
1	Flexibility test	Visual	1 %	BSPTCL Spec.	BSPTCL Spec		A	J	U	W/ Z		Y	

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2	Strand & Stranding Checking	Visual	1 Sample / 500 Nos. or Part of thereof	BSPTCL Spec.	259 wires of 0.417 mm Dia., 7 stranded ropes each of 37 bunched wires		A	J	U	W/ Z		Y	
3	Slip Strength Test	Mechanical	2 Samples / 500 Nos. or Part of thereof	BSPTCL Spec. / Apprd. Drwg.	3 KN Min.		A	J	U	W/ Z		Y	
4	Resistance Test	Electrical	3 Samples / 500 Nos. or Part of thereof	BSPTCL Spec. / Apprd. Drwg.	0.00140Ohm Max.		A	J	U	W/ Z		Y	
<b>iii</b>	<b>SUSPENSION / TENSION CLAMP FOR EARTHWIRE</b>												
1	Mechanical Strength Test on each component excluding Tension Clamp	Mechanical	2 Samples / 500 Nos.	BSPTCL Spec. / Apprd. Drwg.	Withstand Specified Load/ Apprd. Drwg.		A	J	U	W/ Z		Y	
2	Slip Strength Test of Tension Clamp	Mechanical	2 Samples / 500 Nos. or Part of thereof	BSPTCL Spec. / IS 2121	Apprd. Drwg./95% UTS of E/W.		A	J	U	W/ Z		Y	
3	Breaking Strength Test on Tension Clamp	Mechanical	2 Samples / 500 Nos. or Part of thereof	BSPTCL Spec. / Apprd. Drwg.	Withstand Specified Load/ Apprd. Drwg.		A	J	U	W/ Z		Y	
4	Slip Strength Test on Suspension Clamp	Mechanical	2 Samples / 500 Nos. or Part of thereof	BSPTCL Spec. / Apprd. Drwg.	Apprd. Drwg. / 12 to 17 KN		A	J	U	W/ Z		Y	
5	Breaking Strength Test on Suspension Clamp	Mechanical	2 Samples / 500 Nos. or Part of thereof	BSPTCL Spec. / Apprd. Drwg.	Apprd. Drwg./25KN Min.		A	J	U	W/ Z		Y	
6	Hardness Test on Steel Sleeve	Physical	2 Samples / 500 Nos. or Part of thereof	BSPTCL Spec. / IS2121	120 to 160BHN.		A	J	U	W/ Z		Y	
<b>iv</b>	<b>MIDSPAN COMPRESSION JOINT / REPAIR SLEEVE / T-CONNECTOR</b>												
1	Hardness Test on Steel Sleeve	Physical	2 Samples / 500 Nos. or Part of thereof	BSPTCL Spec. / IS 2121	120 to 160BHN.		A	J	U	W/ Z		Y	

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2	Slip Strength Test On Midspan Compression Joint	Mechanical	1 Sample / 500 Nos. or Part of thereof	BSPTCL Spec. / IS 2121	Apprd. Drwg. / Min. 95% UTS of Cond. or E/W.		A	J	U	W/Z		Y	
3	Axial Tensile Load Test on T connector	Mechanical	1 Sample / 500 Nos. or Part of thereof	BSPTCL Spec. / IS 2121	Min. 30 KN		A	J	U	W/Z		Y	
<b>v</b>	<b>RIGID SPACER</b>												
1	Compression & Tension Test	Mechanical	IS : 10162	BSPTCL Spec. / IS 10162	BSPTCL Spec. / Apprd. Drwg.		A	J	U	W/Z		Y	
2	Clamp Slip Test	Mechanical	IS : 10162	BSPTCL Spec. / IS 10162	2.5 KN – 5 KN / Apprd. Drwg.		A	J	U	W/Z		Y	
3	Clamp Bolt Torque Test	Mechanical	IS : 10162	BSPTCL Spec. / IS 10162	150 % of Specified Torque. / Apprd. Drg.		A	J	U	W/Z		Y	
4	Assembly Torque Test	Mechanical	IS : 10162	BSPTCL Spec. / IS 10162	Apprd. Drwg.		A	J	U	W/Z		Y	
<b>vi</b>	<b>BUNDLE SPACER</b>												
1	Compression & Tension Test	Mechanical	IS : 10162	BSPTCL Spec. / IS 10162	BSPTCL Spec. / Apprd. Drwg.		A	J	U	W/Z		Y	
2	Movement Test	Mechanical	IS : 10162	BSPTCL Spec. / IS 10162	BSPTCL Spec. / Apprd. Drwg.		A	J	U	W/Z		Y	
3	Shore Hardness Test (Rubber Compound)	Physical	1%	BSPTCL Spec.	65 – 80 Shore A		A	J	U	W/Z		Y	
4	UTS of Retaining Rod	Mechanical	IS : 10162	BSPTCL Spec. / IS 2121	Min. 35Kg/mm <sup>2</sup>		A	J	U	W/Z		Y	
5	Conductivity Test for Retaining Rod	Electrical	IS : 10162	BSPTCL Spec. / IS 2121	40% of IACS min.		A	J	U	W/Z		Y	
6	Clamp Slip Test	Mechanical	IS : 10162	BSPTCL Spec. / IS 10162	2.5 KN – 5 KN. / Apprd. Drwg.		A	J	U	W/Z		Y	
<b>vii</b>	<b>SPACER DAMPER</b>												
1	Compression & Tension Test	Mechanical	IS : 10162	BSPTCL Spec. / IS 10162	BSPTCL Spec. / Apprd. Drwg.		A	J	U	W/Z		Y	

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2	Movement Test	Mechanical	IS : 10162	BSPTCL Spec. / IS 10162	BSPTCL Spec. / Apprd. Drwg.		A	J	U	W/Z		Y	
3	Shore Hardness Test (Rubber Compound)	Physical	1%	BSPTCL Spec. / Apprd. Drwg.	55 ± 5 Shore A		A	J	U	W/Z		Y	
6	Clamp Slip Test	Mechanical	IS : 10162	BSPTCL Spec. / IS 10162	2.5 KN – 5 KN. / Apprd. Drwg.		A	J	U	W/Z		Y	
3	Clamp Bolt Torque Test	Mechanical	IS : 10162	BSPTCL Spec. / IS 10162	150 % of Specified Torque. / Apprd. Drg.		A	J	U	W/Z		Y	
4	Assembly Torque Test	Mechanical	IS : 10162	BSPTCL Spec. / IS 10162	Apprd. Drwg. / 40 N-M		A	J	U	W/Z		Y	

<b>E</b>	<b>PACKING &amp; DISPATCH</b>												
1	Visual Inspection	Visual	100%	EM Plant Standard	EM Plant Standard		A	J	S	W		N	
2	Verification of Quantity / Packing Details / Packing Slip		100%	Packing List	Packing List		A	J	S	W		N	
3	Check of Dispatch Clearance/ Instructions		100%	Dispatch Clearance/Instructions	Dispatch Clearance/Instructions		A	J	S	W		N	