



BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN – CLAMPS & CONNECTORS


	Manufacturer's Details (Name, Works Address etc.)	Customer	Vendor's Code:	Item:	M.Q.P. No. 027	Date :04.01.16	Valid From:15.01.16
OFFICE & WORKS		BSPTCL		Clamps, Connectors, Spacers, Corona Bell, Welding sleeve and Earth wire clamps (upto 400 kV)	Rev. No.00	Sheet No. : 01 of 25	Valid Up to:Till Revision

LEGEND FOR CODES :

<p>CODE 1 : Indicates place where testing is planned to be performed (i.e. location of inspection)</p> <p>A : At equipment manufacturer's works B : At component manufacturer's works C : At authorized distributor's place D : At independent laboratory E : At turnkey contractor's location F : Not specified</p>	<p>CODE 2 : Indicates who has to perform the test (i.e., Testing agency)</p> <p>J : Equipment Manufacturer K : Component Manufacturer L : Third Party M : Turnkey Contractor</p>
<p>CODE :3 : Indicates who will witness the test (i.e. Witnessing Agency)</p> <p>P : Component manufacturer himself Q : Component manufacturer & Equipment manufacturer R : Component manufacturer , Equipment manufacturer & Contractor S : Equipment manufacturer himself T : Equipment manufacturer & Contractor U : Equipment manufacturer , Contractor &BSPTCL V : Third Party</p>	<p>CODE 4 : Indicates review of Test reports / certificates</p> <p>W : By Equipment Manufacturer during raw material / bought out component inspection X : By Contractor during product / process inspection Y : By BSPTCL during product / process inspection Z : By contractor & / or BSPTCL during product / process inspection</p>
<p>CODE 5 : Whether specific approval of sub vender/Component make is envisaged or Not</p> <p>E : Envisaged N : Not Envisaged</p>	<p>CODE 6 : Indicates whether test records required to be submitted after final inspection for issuance of Dispatch Clearance/Instructions</p> <p>Y : Yes N : No</p>

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OFFICE & WORKS		BSPTCL			Rev. No.00	SHEET No. : 02 of 25	Valid Up to: Till Revision

GENERAL NOTES

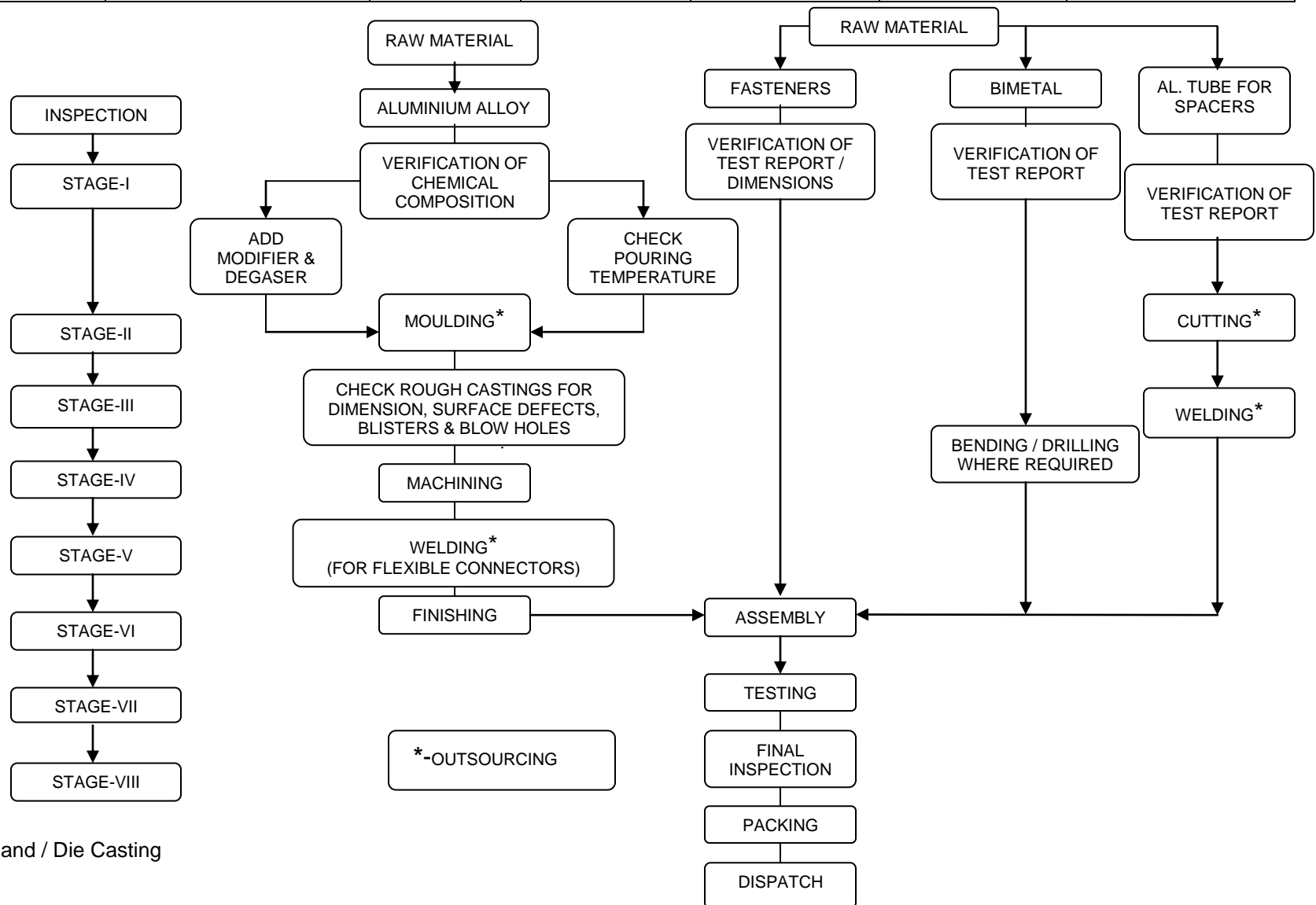
1.	This MQP should be read in conjunction with BSPTCL specification
2.	BSPTCL specification means contract specific technical specification, BSPTCL approved drawings, technical data sheet and LOA provisions.
3.	Incase of any contradiction between manufacturer's plant standards, this MQP and BSPTCL specification, following precedence shall be followed:
a.	BSPTCL specification
b.	This MQP
c.	Manufacturer's plant standards
4.	Wherever Indian / International technical standards are referred they shall include their latest amendments.
5.	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 any delay at the time of inspection.
6.	The manufacturer shall ensure that all their Control, Metering and Testing instruments as well as of their sub vendors are calibrated (preferably through NABL accredited laboratory) and the same is traceable to Indian / International Standards. Calibration records should be available during inspection by BSPTCL.
7.	All raw material / bought out items should be procured from BSPTCL approved sources only.
8.	Manufacturer shall show the approval of BSPTCL Engineering for all contract specific Type Tests, as per the technical specification, at the time of Final Inspection.
9.	The manufacturer shall maintain proper co-relation of test certificates from raw material stage to finished product stage and the records should be available during inspection by BSPTCL
10.	Incase of any tests being carried out at the third party lab, such lab should be NABL accredited / Government owned or controlled / approved by BSPTCL.
11.	All the packing cases should have BSPTCL LOA details, project name, item description and Dispatch Clearance/Instructions number by which material has been cleared for despatch.
12.	One copy of test report, Dispatch Clearance/Instructions shall also be sent along with the consignment.
13.	Inspection of spare items ordered by BSPTCL shall also be governed by this MQP.
14.	The manufacturer shall align their Quality System and that of their sub-vendors to the requirements of latest series of ISO 9000 Quality Standards in a time bound manner.
15.	BSPTCL may review the effective implementation of the process during product/process. In case any violation in process or process parameters are observed the reasons along with the corrective and preventive measures shall be conveyed to BSPTCL within 2 weeks.
16.	Any addition / change in new Vendor / Design / Process shall call for review by BSPTCL and change in MQP, if necessary.
17.	The list of component manufactures for which approval is envisaged in enclosed herewith.

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FLOW CHART :
FOR CLAMPS, CONNECTORS, SPACERS AND CORONA BELLS




Moulding Process :

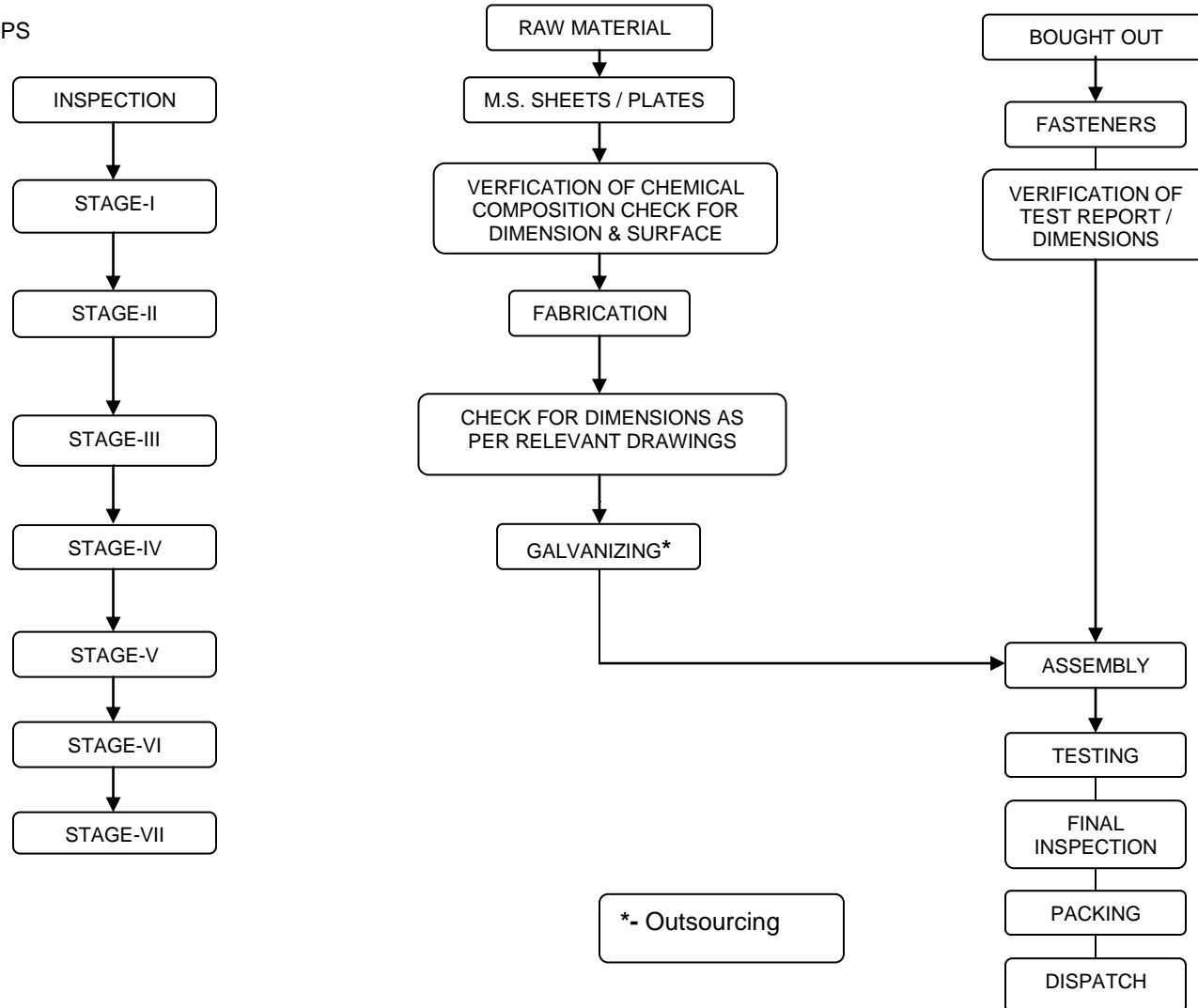
- Upto 400kV : Sand / Die Casting

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FLOW CHART :
FOR EARTHWIRE CLAMPS




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SECTION – A : RAW MATERIAL INSPECTION

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						Remarks
							1	2	3	4	5	6	
1.	RAW MATERIAL : ALUMINIUM ALLOY INGOTS FOR CASTINGS Alloy Gr.4600 to IS: 617												
a)													
i)	CHEMICAL ANALYSIS	Chemical	One sample per batch	IS : 617 -1994 4600 (A6) Grade	IS : 617 -1994 4600 (A6) Grade Si – 10 to 13% Cu – 0.1% max Mg – 0.1% max Fe – 0.6% Mn – 0.5% Ni – 0.1% Zn -0.1% Pb – 0.1% Sn – 0.05% Ti – 0.2% Al - Remainder	Test Report	D	L	V	W/Z	E -	Y	Sample to be selected by Clamps and connectors manufacturer and sent to third party lab for tests. TPL report to be submitted during BSPTCL final product inspection of clamps and connectors.
ii)	TENSILE STRENGTH	Mechanical	One sample per batch	IS : 617 -1994 4600 (A6) Grade	IS : 617 -1994 4600 (A6) Grade 16.5 kg/sq. mm min	Test Report	D	L	V	W/Z	-	N	
iii)	PERCENTAGE ELONGATION	Mechanical	One sample per batch	IS : 617 -1994 4600 (A6) Grade	IS : 617 -1994 4600 (A6) Grade 5% Min.	Test Report	D	L	V	W/Z	-	N	


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SECTION – A : RAW MATERIAL INSPECTION

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						Remarks
							1	2	3	4	5	6	
1.	RAW MATERIAL : ALUMINIUM ALLOY INGOTS FOR CASTINGS Alloy Gr.1900 to IS: 617												
b)													
i)	CHEMICAL ANALYSIS	Chemical	One sample per batch	IS : 617 -1994 1900 Grade	IS : 617 -1994 1900 Grade Si – 0.5% Cu – 0.2% max Mg – 0.05% max Fe – 0.6% Mn – 0.2% Ni – 0.1% Zn -0.1% Pb – 0.05% Sn – 0.05% Al. - 99 % min	Test Report	D	L	V	W/Z	-	N	Sample to be selected by Clamps and connectors manufacturer and sent to third party lab for tests. TPL report to be submitted during BSPTCL final product inspection of clamps and connectors


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SECTION – A : RAW MATERIAL INSPECTION

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						Remarks
							1	2	3	4	5	6	
c) i)	ALUMINIUM ALLOY SHEETS FOR 765Kv CORONA BELL Alloy Gr.AA1100 CHEMICAL ANALYSIS	Chemical	One sample per batch	ASTM stddB 209	Gr. AA1100 Si – 0.5% max Cu – 0.2% max Fe – 0.5% max Mn – 0.05% max Al. - 99 % min	Test Report	B	K	P	W/Z	E -	N	

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SECTION – A : RAW MATERIAL INSPECTION

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						Remarks
							1	2	3	4	5	6	
1. c) l)	<u>RAW MATERIAL :</u> COPPER ALLOY FOR CASTING CHEMICAL ANALYSIS	Chemical	One Sample each	IS : 292 – 1983 Grade LCB2	IS : 292 – 1983 * Grade LCB2 Cu – 63 to 67% Fe – 0.5% Max Pb – 1 to 3% Ti – 1.5% max Al – 0.01% Max Zn - Remainder	Test Report	D	L	V	W/Z	-	N	* Since the requirements are small, raw material will be procured from local source and tested for chemical composition before casting.

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SECTION – A : RAW MATERIAL INSPECTION

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						Remarks
							1	2	3	4	5	6	
1.	<u>RAW MATERIAL :</u>												
d)	COLD / HOT ROLLED CARBON STEEL SHEETS & STRIPS FOR EARTH WIRE CLAMPS **												
i)	CHEMICAL ANALYSIS	Chemical	One Sample per Lot	IS : 513 – 1994 Gr. D for C.R IS : 1079 – 1994 Gr. D for H.R	IS : 513 – 1994 Gr. D for C.R IS : 1079 – 1994 Gr. D for H.R C - 0.12% max. Mn - 0.5% max. S - 0.04% max P - 0.04% max	Test report	D	L	V	W/Z	-	N	**Cold rolled sheet which is better than HR sheet is added to enable the vendor to procure raw material based on availability in the market when required.
ii)	BEND TEST	Mechanical	One Sample per Lot	IS : 513 – 1994 Gr. D for C.R IS : 1079 – 1994 Gr. D for H.R	IS : 513 – 1994 Gr. D for C.R IS : 1079 – 1994 Gr. D for H.R	Test report	D	L	V	W/Z	-	N	
e)	STRUCTURAL STEEL FOR EARTH WIRE TENSION CLAMP												
l)	CHEMICAL ANALYSIS	Chemical	One Sample per Lot	IS : 2062, Gr. A	As per BSPTCL norm C – 0.23% Max Mn –1.5% Max. S – 0.05% max. P – 0.05% max. Si – 0.4 % max	Test Report	D	L	V	W/Z	-	N	

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SECTION – A : RAW MATERIAL INSPECTION

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						Remarks
							1	2	3	4	5	6	
1.	RAW MATERIAL :												
f)	D- SHACKLE FOR EARTH WIRE TENSION CLAMP												
l)	Chemical Analysis	Chemical	One Sample per Lot	BSPTCLspecn./ IS:2004/ IS:1608 C - 0.4 - .0.5% . Si 0.15 - .0.35% Mn - 0.6 - .0.9% S - 0.04% Max. P - 0.04% Max.	IS:2004 / IS : 1608 Permissible variations over & under specified limits – Percent max C – 0.03% Si – 0.03% Mn – 0.04% S – 0.005% P – 0.005%	Test Report	B	K	P	W/Z	E -	N	Through Dispatch Clearance/ Instructions. Report review during inspection.
ii)	Galvanizing Test	Chemical											
a)	Mass of Zinc coating	Physical	Random sampling	IS:2629/IS:2633/ IS : 4759	IS:2629/IS:2633/ IS : 4759	Test Report	B	K	P	W/Z	-	N	
b)	Uniformity of Coating	Visual	Random sampling	IS:2629/IS:2633/ IS : 4759	IS:2629/IS:2633/ IS : 4759	Test Report	B	K	P	W/Z	-	N	
c)	Adhesion test	Mechanical	Random sampling	IS:2629/IS:2633/ IS : 4759	IS:2629/IS:2633/ IS : 4759	Test Report	B	K	P	W/Z	-	N	

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SECTION – A : RAW MATERIAL INSPECTION

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						Remarks	
							1	2	3	4	5	6		
g)	STEEL WIRE FOR SPRING (SPACER)													
i)	Chemical analysis	Chemical	One Sample per Lot	IS : 4454 C – 0.75 -1.0% Si – 0.15- 0.35% Mn – 0.8max S – 0.03% max P – 0.03 % max	IS : 4454 Permissible variations over & under specified limits – Percent max C – 0.02% Si – 0.03% Mn – 0.05% S – 0.005% P – 0.005%	Test report	B	K	P	W/Z	N -	N		
ii)	Chemical analysis	Chemical	One Sample once in 6 Months in 3 rd Party Lab	IS : 4454 C – 0.35 -1.0% Si – 0.03% Mn – 0.3 to 1.2% S – 0.3% max P – 0.3 % max	IS : 4454 Permissible variations over & under specified limits – Percent max C – 0.02% Si – 0.03% Mn – 0.05% S – 0.005% P – 0.005%	Test report	D	L	V	W/Z	-	N		

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SECTION – A : RAW MATERIAL INSPECTION														
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						Remarks	
							1	2	3	4	5	6		
1. h)	RAW MATERIAL : STEEL FOR ANTICATERING SPRING : CHEMICAL ANALYSIS	Chemical	One Sample per Lot	IS : 4454 C – 0.75 -1.0% Si – 0.15-0.35% Mn – 0.8max S – 0.03% max P – 0.03 % max	IS : 4454 Permissible variations over & under specified limits – Percent max C – 0.02% Si – 0.03% Mn – 0.05% S – 0.005% P – 0.005%	Test report	D	L	V	W/Z	N	-	N	
J)	WASHER FOR SPACER (HYLAM)			IS: 1998/IS:2036	IS : 2036-1974	Test Report	B	K	P	W/Z	N	N		
I)	Tensile strength (min.)	Mechanical	One Sample per Lot	600 kg/sq. cm										
ii)	Impact strength (min.)	Mechanical		9.0 kgf /cm										
iii)	Insulation resistance (min.)	Electrical		1.0 Meg Ohm										
iv)	Water absorption (max.)	Physical		76 mg										
k)	Cu / Al. BIMETAL SHEET		One sample per lot		No crack / fracture No separation	Test Report	B	K	P	W/Z	N	N		
I)	Bend test	Mechanical												
ii)	Reverse bend test	Mechanical												
iii)	Chemical Analysis (before forming)	Chemical	One Sample once in 3 Months in 3 rd Party Lab		Min. 99.5% purity for Cu and Min 99.0% for Al.	Test Report								
iv)	Chemical Analysis	Chemical			Min. 99.5% purity for Cu and Min 99.0% for Al.	Test Report	D	L	V	W/Z	-	N		

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SECTION – A : RAW MATERIAL INSPECTION

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						Remarks	
							1	2	3	4	5	6		
1.	RAW MATERIAL : ALUMINIUM ALLOY TUBE FOR SPACER & WELDING SLEEVE :													
i)	Chemical analysis	Chemical	One Sample per Lot	IS : 5082 63401 Wp Gr.	IS : 5082 63401 WP Gr. Cu – 0.05% Mg – 0.4 to 0.9% Si – 0.3 to 0.7% Fe – 0.5% max Mn – 0.03% max Al - remainder	Test report	B	K	P	W/Z	-	N		
ii)	Tensile strength	Mechanical	One Sample per Lot	IS : 5082 63401 Wp Gr.	IS : 5082 200 Mpa min.	Test Report	B	K	P	W/Z	-	N		
iii)	Percentage elongation	Mechanical	One Sample per Lot	IS : 5082 63401 Wp Gr.	IS : 5082 10 % min.	Test report	B	K	P	W/Z	-	N		
iv)	0.2% Proof stress	Mechanical	One Sample per Lot	IS : 5082 63401 Wp Gr.	IS : 5082 170 Mpa min.	Test report	B	K	P	W/Z	-	N		
v)	Conductivity at 20 deg C	Electrical	One Sample per Lot	IS : 5082 63401 Wp Gr.	IS : 5082 55% IACS min	Test Report	B	K	P	W/Z	-	N		

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SECTION – B : INPROCESS INSPECTION

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						Remarks
							1	2	3	4	5	6	
II I a)	<u>IN PROCESS VISUAL CHECK</u> <u>For Casting :</u> Free from cavities, Blow holes. Other Surface defects <u>For Tube :</u> Clean smooth and free from harmful defects. <u>For Earth Wire</u> <u>Clamps :</u> Free from harmful defects	Visual	100%	I.S : 5561-1970	I.S : 5561- 1970	Internal Record	A/B	J	S	W	-	N	
I b)	Molding Process Verification : Check Temperature and addition of Modifier /Degasser	Visual	Once per Melting	Plant Standard	720 deg C ± 10deg	Internal Record	B	K	S	W	-	N	
I c)	Reduced Pressure Test	Physical	Once per Melting	Plant Standard	Reduction in density after test < 10% Free from acceptable level of discontinuity on account of blow holes.	Internal Record	B	K	S	W	-	N	
I d)	Ultrasonic Flaw Detection (For Aluminium Castings)	Mechanical	Random Samples – 3nos every 3 months	Manufacturer's spec		Internal Record	D	L	V	W	-	N	
ii)	DIMENSIONAL CHECK	Physical	100% gauge for PCD and 5% for all other dimensions	BSPTCL Approved Drg.	Approved Drawing	Internal Record	A	J	S	W	-	N	

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SECTION C: FINAL INSPECTION

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						Remarks
							1	2	3	4	5	6	
III i)	<u>ROUTINE TESTS</u> VISUAL CHECK	Visual	100%	I.S : 5561 / I.S : 10162 / BSPTCL Spec.	I.S : 5561 / I.S : 10162 Free from manufacturing defects	Test Report	A	J	S	W/Z	-	N	
ii)	DIMENSIONAL CHECK	Physical	100%	BSPTCL Approved drawing/	Approved Drawing	Test Report	A	J	S	W/Z	-	N	
IV (a) i)	<u>ACCEPTANCE TESTS FOR CLAMPS AND CONNECTORS</u> VISUAL CHECK	Visual	Nearest whole number of 0.5% of batch on random basis	I.S. : 5561-1970 / BSPTCL Spec Free from cavities, blow holes and other surface defects	I.S. : 5561-1970	Test Report	A	J	U	W/Z	-	Y	
ii)	DIMENSIONAL CHECK	Physical	"DO"	I.S. : 5561-1970/ BSPTCL Spec. Approved Drawing	Approved Drawing	Test Report	A	J	U	W/Z	-	Y	
iii)	TENSILE TEST	Mechanical	"DO"	I.S. : 5561-1970/ BSPTCL Spec.	I.S. : 5561-1970	Test Report	A	J	U	W/Z	-	Y	
iv)	RESISTANCE TEST	Electrical	"DO"		I.S. : 5561-1970	Test Report	A	J	U	W/Z	-	Y	
v)	Torque Strength Test on Bolted Connectors	Mechanical	3 samples per Lot	Approved drawing	No visible sign of crack at 100% of recommended torque	Test Report	A	J	U	W/Z	-	Y	
vi)	Sliding Movement Test on Expansion Type Connectors	Mechanical	1 sample per Type per Lot	Manufacturer's spec	Sliding Movement shall be ensured at a minimum load of 100kg	Test Report	A	J	U	W/Z	-	-	Test Applicable for each type per lot for quantity exceeding 100nos
Vii)	CHEMICAL ANALYSIS	CHEMICAL	1 sample/batch	IS617	IS617	TPL report	D	L	V	W	-	Y	

BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN- CLAMPS & CONNECTORS


	Manufacturers Details (Name, Works Address etc.)	Customer	Vendor's Code:	Item: Clamps, Connectors, Spacers, Corona Bell, Welding sleeve and Earth wire clamps (upto 400 kV)	M.Q.P. No. 027	Date : 04.01.16	Valid From: 15.01.16
OFFICE & WORKS		BSPTCL			Rev. No.00	SHEET No. : 16of 25	Valid Up to: Till Revision

SECTION – C : FINAL INSPECTION

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						Remarks
							1	2	3	4	5	6	
(b)	<u>ACCEPTANCE TESTS FOR SPACERS FOR TWIN & QUAD CONDUCTORS-IN STATIC CONDITION</u>												
i)	VISUAL CHECK	Visual	Nearest whole number of 0.5% of batch on random basis	I.S. : 10162	I.S. : 10162	Test report	A	J	U	W/Z	-	Y	
ii)	DIMENSIONAL CHECK	Physical	I.S. : 10162	BSPTCL Approved Drawing	Approved Drawing	Test report	A	J	U	W/Z	-	Y	
iii)	MOVEMENT TEST (APPLICABLE FOR FLEXIBLE SPACERS ONLY)	Mechanical	I.S. : 10162	I.S. : 10162 / BSPTCL Spec	I.S. : 10162	Test report	A	J	U	W/Z	-	Y	
iv)	CLAMP SLIP TEST	Mechanical	I.S. : 10162	I.S. : 10162 / BSPTCL Spec	I.S. : 10162	Test report	A	J	U	W/Z	-	Y	
v)	CLAMP BOLT TORQUE TEST	Mechanical	I.S. : 10162	I.S. : 10162 / BSPTCL Spec	I.S. : 10162	Test report	A	J	U	W/Z	-	Y	
vi)	ASSEMBLY TORQUE TEST	Mechanical	I.S. : 10162	I.S. : 10162 / BSPTCL Spec	I.S. : 10162	Test report	A	J	U	W/Z	-	Y	
vii)	COMPRESSION AND TENSILE LOAD TEST	Mechanical	I.S. : 10162	I.S. : 10162 / BSPTCL Spec	I.S. : 10162	Test report	A	J	U	W/Z	-	Y	

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OFFICE & WORKS		BSPTCL			Rev. No.00	SHEET No. : 17 of 25	Valid Up to: Till Revision

SECTION – C : FINAL INSPECTION

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						Remarks
							1	2	3	4	5	6	
(c) i)	<u>ACCEPTANCE TESTS FOR CORONA BELLS</u> VISUAL CHECK	Visual	Nearest whole number of 0.5% of batch on random basis	I.S. : 5561-1970 / BSPTCL Spec / Free from cavities, blow holes and other surface defects	Approved Drawing	Test Report	A	J	U	W/Z	-	Y	
ii)	DIMENSIONAL CHECK	Physical	Nearest whole number of 0.5% of batch on random basis	I.S. : 5561-1970/ BSPTCL Spec. approved drawing / spec.	Approved Drawing	Test Report	A	J	U	W/Z	-	Y	
iii)	DP Test for Welding	Chemical	Nearest whole number of 0.5% of batch on random basis	BSPTCL Specification	No Cracks or imperfections	Test Report	A	J	U	W/Z	-	Y	
(d) i)	<u>ACCEPTANCE TESTS ON WELDING SLEEVES</u> VISUAL CHECK	Visual	Nearest whole number of 0.5% of batch on random basis	I.S. : 5561-1970 / BSPTCL Spec./ Clean,smooth and free from harmful defects	Approved Drawing	Test Report	A	J	U	W/Z	-	Y	
ii)	DIMENSIONAL CHECK	Physical	"DO"	BSPTCL Aoorived drawing / Spec.	Approved Drawing	Test Report	A	J	U	W/Z	-	Y	

BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN- CLAMPS & CONNECTORS


	Manufacturers Details (Name, Works Address etc.)	Customer	Vendor's Code:	Item: Clamps, Connectors, Spacers, Corona Bell, Welding sleeve and Earth wire clamps (upto 400 kV)	M.Q.P. No. 027	Date : 04.01.16	Valid From: 15.01.16
OFFICE & WORKS		BSPTCL			Rev. No. 00	SHEET No. : 18 of 25	Valid Up to: Till Revision

SECTION – C : FINAL INSPECTION

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						Remarks
							1	2	3	4	5	6	
(e)	<u>ACCEPTANCE TESTS FOR EARTH WIRE CLAMPS</u>												
i)	VISUAL CHECK	Visual	Nearest whole number of 0.5% of batch on random basis	BSPTCL Spec.	BSPTCL Spec. Free from harmful defects	Test Report	A	J	U	W/Z	-	Y	
ii)	DIMENSIONAL CHECK	Physical	Nearest whole number of 0.5% of batch on random basis	Approved drawing	As per Tolerance In GA Drawings	Test Report	A	J	U	W/Z	-	Y	
iii)	GALVANISING TEST ON M.S. SHEET												
a)	MASS OF ZINC COATING	Physical	Random Sampling basis	I.S.2629 / I.S.2633 / I.S.4759	I.S.2629 / I.S.2633 / I.S.4759	Test Report	A	J	U	W/Z	-	Y	
b)	UNIFORMITY OF ZINC COATING	Visual	Random Sampling basis	I.S.2629 / I.S.2633 / I.S.4759	I.S.2629 / I.S.2633 / I.S.4759	Test Report	A	J	U	W/Z	-	Y	
c)	ADHESION TEST	Mechanical	Random Sampling basis	I.S.2629 / I.S.2633 / I.S.4759	I.S.2629 / I.S.2633 / I.S.4759	Test Report	A	J	U	W/Z	-	Y	

BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN- CLAMPS & CONNECTORS


	Manufacturers Details (Name, Works Address etc.)	Customer	Vendor's Code:	Item: Clamps, Connectors, Spacers, Corona Bell, Welding sleeve and Earth wire clamps (upto 400 kV)	M.Q.P. No. 027	Date : 04.01.16	Valid From: 15.01.16
OFFICE & WORKS		BSPTCL			Rev. No. 00	SHEET No. : 19 of 25	Valid Up to: Till Revision

SECTION – C : FINAL INSPECTION

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						Remarks
							1	2	3	4	5	6	
(f)	<u>BOLTS, NUTS & SCREWS</u>												
i)	VISUAL CHECK	Visual	As per BSPTCL Practice	BSPTCL Spec.	BSPTCL Spec.		A	J	U	W/Z	-	Y	Through Dispatch Clearance/ Instructions. Report review during inspection.
ii)	DIMENSIONAL CHECK	Physical	As per BSPTCL Practice	I.S.1363 / I.S.1367 BSPTCL Spec.	I.S.1363 / I.S.1367 BSPTCL Spec.		A	J	U	W/Z	-	Y	
iii)	GALVANISING TEST UNIFORMITY OF ZINC COATING	Chemical	1 pieces of each type & Size	I.S.2633 / I.S.1573 BSPTCL Spec.	I.S.1363 / I.S.1367 BSPTCL Spec.		A	J	U	W/Z	-	Y	

BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN- CLAMPS & CONNECTORS

	Manufacturers Details (Name, Works Address etc.)	Customer	Vendor's Code:	Item: Clamps, Connectors, Spacers, Corona Bell, Welding sleeve and Earth wire clamps (upto 400 kV)	M.Q.P. No. 027	Date : 04.01.16	Valid From: 15.01.16
OFFICE & WORKS		BSPTCL			Rev. No. 00	SHEET No. : 20 of 25	Valid Up to: Till Revision

SECTION – C : FINAL INSPECTION

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						Remarks
							1	2	3	4	5	6	
(g)	<u>SPRING WASHERS</u>												
i)	VISUAL CHECK	Visual	I.S.3063/ BSPTCL NORM	BSPTCL Spec.	I.S.3063	Test Report	B	K	P	W/Z	E	N	Through Dispatch Clearance/ Instructions. Report review during inspection.
ii)	DIMENSIONAL CHECK	Physical	I.S.3063/ BSPTCL NORM	I.S.3063 BSPTCL Spec.	I.S.3063	Test Report	B	K	P	W/Z	-	N	
iii)	HARDNESS TEST	Mechanical	I.S.3063/ BSPTCL NORM	I.S.3063 / I.S.1586/ I.S.1501 BSPTCL Spec.	Hardness- 43 to 50 HRC	Test Report	B	K	P	W/Z	-	N	
iv)	TWIST TEST	Mechanical	I.S.3063/ BSPTCL NORM	I.S.3063 / BSPTCL Spec./ No sign of fracture when twisted through 90 degree	I.S.3063	Test Report	B	K	P	W/Z	-	N	
v)	PERMANENT SET TEST	Mechanical	I.S.3063	I.S.3063 / BSPTCL Spec./ Spring washer shall be compressed flat for 2 min. on release of pressure free height of washer shall not be less than specified in I.S.3063	I.S.3063	Test Report	B	K	P	W/Z	-	N	
vi)	PERMANENT LOAD TEST	Mechanical	I.S.3063	I.S.3063 / BSPTCL Spec.	I.S.3063	Test Report	B	K	P	W/Z	-	N	
vii)	GALVANISING TEST (Coating thickness)	Chemical	I.S.3063	I.S.6821 / I.S.3063 I.S.1573 BSPTCL Spec	I.S.6821 / I.S.3063 I.S.1573	Test Report	B	K	P	W/Z	-	N	
h)	Welder Qualification	Verification	I.S.6821 / I.S.3063 / I.S.1573 N.A	BSPTCL Approved Document.	BSPTCL Approved Document.	-	-	-	-	Z	-	N	

SOURCE OF RAW MATEIALS

Sh: 21 / 25

Sl. No.	RAW MATERIAL / COMPONENT	VENDOR
1.	Aluminium Alloy Ingot	<p>SRI VENKATESWARA NON FERROUS FOUNDRY 19/5, Industrial Area, Azamabad, Hyderabad – 500 020 (AP). Ph : 040 – 27603829, 27615225 Fax ; 040 – 27656218</p> <p>PADMA METALS OFF: 10, Govardhan Street, Rayapettah, Chennai – 600014</p> <p>FAC : 2/497, Mambakkam Road, Medavakkam, Chennai – 601302 Ph : 044 – 22770870, 22770904</p> <p>ADISHAKTI ALLOYS PVT LTD D.H ROAD VIII – GANGARAMPUR, P.O. 'D' ALIPUR 24,PARGANAS(S), WEST BENGAL – 745 503 PH: 033-2470 7952,24707953</p> <p>HINDALCO INDUSTRIES LIMITED P.O Renukoot – 231217 Dist. Sonbhadra, Uttar Pradesh Ph : 05446 – 52107, 52427</p>
2.	Aluminium Tube	<p>CENTURY EXTRUSIONS LTD No, 113, park Street 'N' Block, 2ndFloor, Kolkata – 700016 Ph : 033 – 22291291/1012 fax : 033 – 22261110</p> <p>JINDAL ALUMINIUM LIMITED Jindal Nagar, Tamkur road, Bangalore – 560073 Ph : 080 – 23715555 Fax : 080 – 23713333</p>
3.	Structural Steel for Earthwire Tension Clamp	BSPTCL Approved Vendors

SOURCE OF RAW MATEIALS

Sh: 22 / 25

Sl. No.	RAW MATERIAL / COMPONENT	VENDOR
4.	Aluminium Conductors	SHARAVATHI CONDUCTORS PVT. LTD. No.23, Bangalore Co-Op Indl, Estate, 6 th Mile, Old Madras road, P.B. No. 1609 Bangalore – 560016 Ph : 080 – 28510359, 28510775 Fax : 080 – 28510826
5.	G.I. Bolts, Nuts & Washers	NEXO INDUSTRIES PVT LTD Vill, mangarh, Kohara – machiwara Road, Ludhiana. Ph : Fac : 843662 – 62 Off : 532331 – 33 Fax : 532334, 535280 ASP PRIVATE LIMITED 7, Kumar Para Road, Liluah, Howrah – 711204 Ph : 033 – 226454782 / 1731, 55268112 / 13 / 14 Fax : 033 – 222044001, 26455138 J.S. INDUSTRY 76/18/3, Benaras Road, Howrah – 711101 Ph : 09903220065
6.	Spring Washers	FORBES GOKAK LTD., Saki, Powai Road, Chandivali, Mumbai – 400072 Ph : 022 – 28471861 NAVEEN METAL INDUSTRIES 265, Rai Bahadur Road, Kolkata – 700053, Ph : 033 – 4006402, 4003441

SOURCE OF RAW MATERIALS

Sh: 23 / 25

Sl. No.	RAW MATERIAL / COMPONENT	VENDOR
7.	Helical Springs	<p>DURABLE SPRINGS 34, Vellalar Steet, 3rdMain Road, Chennai – 58, Ph : 044 – 26255756</p> <p>FEDERN FABRIK Plot No. 23 & 24, 1stLink Road, Nehru Nagar, kottivakkam, Chennai - 600041</p>
8.	Hylam Washers	<p>MECHLEC INSULATIONS D-5,(New No-9) Industrial Estate, J.J. Nagar, Mogappair East, Chennai – 600037 Ph : Fac : 044 – 26533338 Off : 044 – 23744101</p>
9.	Cu – Al Bimetallic Sheet	<p>METACLAD INDUSTRIES 15, mahavir Industrial Estate, Sakinaka, Mumbai – 400072 Ph : 022 – 28513637 / 28511593 Fax : 022 – 28510029</p>
10.	Stainless Steel Bolts, Nuts & Washers	<p>AGARWAL FASTERNERS PVT. LYD Off : 110, Narayan Dhuru Street, Mumbai – 400003 Ph : 022 – 23441858 / 23400330 / 23426569 Works : Shed No. 13 – 16, Kaveri, Tugareshwar Industrial Complex No.1 Village, Sativali, Vasi (E) Dist. Thane – 401202 Ph : 0250 – 2481141 Fax : 0250 – 2481147 / 48</p> <p>KUNDAN INDUSTRIES LTD., Off : 252, Mahesh Niwas, Yosuf Mehar Ali Road, 2ndFloor, Mumbai – 400003 Ph : 022 – 3400551 / 33400911 / 341429 Fac : Hari Siddhi Ind. Estate, Arclole Goral Pada, Taluka – Vasai, Dist. Thane Ph : 0250 – 455394 / 95 / 96 97 / 98 Fax : 0250 - 455830</p>

OUT SOURCING

Sh: 24 / 25

SI. No.	RAW MATERIAL / COMPONENT	VENDOR
1.	Moulding / Casting	<p>ARUL INDUSTRIES 13/A, South Well Street, (Near Y.M.C.A) Sathuma Nagar, Thiruvottriyur, Chennai – 600098 Ph : 25990489</p> <p>ANNAI SANTHA SANTHI CASTING No-57C, Bramin Street, Pattaravakkam, Chennai – 600098 Ph : 52189247</p> <p>S.K. METAL WORKS No. 22/129, Basin Road, Gomatha Nagar 1stStreet, Thiruvottiyur, Chennai – 600019 Ph : 044 - 64622104</p> <p>SIBAR AUTO PARTS LIMITED Industrial Estate, Renigunta Road, Tirupati – 517506 Ph : 0877 – 5542779, 2274783</p>
2.	Argon Welding	<p>POWER AIDS 21B (SP), Guindy Industrial Estate, Guindy, Chennai – 600032 Ph : 22324784</p>

3.	Galvanizing	SRI BALAJI & CO 2/750, Tharapakkam Salai, Gerugambakkam, Chennai – 602101 Ph : 23820736
4.	Fabrication of Spacer Tube	JOSEPH ENGINEERING WORKS 127, Sathya Nagar, Padi, Chennai – 600050 Ph: 044 – 26244267 / 26244817