 419 - 401	BHARAT HEAVY ELECTRICALS LIMITED (A Government of India Undertaking) TIRUCHIRAPPALLI - 620 014 SUBCONTRACTING / ADVANCED TECHNOLOGY PRODUCTS	
	Telephone: 0431 – 2575813, 2576160 & 2575180 Fax: 0431 – 2520565	E- mail: nrs@bheltry.co.in or vsenthil@bheltry.co.in
Enquiry Title : Zinc Phosphate Coating of Carbon Steel components	Enquiry Number	626005E
	Date	21.06.2016
	Due Date	12.07.2016

Kindly submit your techno-commercial & price-bids for 'Zinc Phosphate coating of carbon steel components' in a sealed cover addressed to

The Deputy General Manager
Sub-contracting/ATP
Building-2&4 (First Floor)
Bharat Heavy Electricals Limited
Tiruchirappalli-14

duly super-scribing the above **Enquiry Number** and **Due date**.

The offers subject to the acceptance of terms and conditions enclosed should reach us before **14.00 hrs** on the due date. The tender will be opened at **14.30 hrs** on the due date in the presence of Tenderers, who are all present.

Documents submitted with the offer shall be signed and stamped in each page by authorized representative of the bidder; documents not signed and stamped by the authorized signatory of the bidder shall not be accepted and considered for evaluation of the bid.

REFER THE ENCLOSED ANNEXURES FOR SCOPE OF WORK AND DETAILED TERMS & CONDITIONS:

1. Annexure -1 for Scope of work & Delivery conditions
2. Procedure for Zinc Phosphate Coating
3. Sketch for Sl No. 11 Test Coupon
4. Annexure - A Terms & conditions of Enquiry
5. Annexure – B Important points for processing attested material
6. Annexure - C Techno-commercial bid
7. Annexure - N For New Vendors
8. Drawing 1-PV-628-00556

The following points may be noted before submission of tenders:

1. Tenders received after the prescribed time will not be considered for tender opening
2. The enclosed drawings & procedures shall be returned
3. Vendors who are not registered with BHEL-Trichy must fill Annexure-N & attach necessary documents

For Bharat Heavy Electricals Limited

V. Senthil Kumar 21.06.16

SENTHILKUMAR, V
 Engineer
 ATP / Sub-Contracting
 BHEL, TIRUCHY - 620 014



419 - 401

BHARAT HEAVY ELECTRICALS LIMITED

TIRUCHIRAPPALLI - 620 014

SUB CONTRACTING / ADVANCED TECHNOLOGY PRODUCTSANNEXURE-1 TO ENQUIRY No: 626 005E / Dt. 21 - 06 - 2016**COMPONENT DETAILS:**

SI NO	DESCRIPTION & DRAWING No.	RAW MATERIAL SUPPLY DETAILS	WORK ORDER & DU - PART No.	QTY (No)
1)	BOLT VAR-01 1-PV-628-00556/01	As per given Drawing (specn: 25X1MØ)	D149 to D150-001-1-90-628 001 - 0315	152
2)	BOLT VAR-02 1-PV-628-00556/01	As per given Drawing (specn: 25X1MØ)	D149 to D150-001-1-90-628 001 - 0317	50
3)	WASHER D120.2-H12 1-PV-628-00556/01	As per given Drawing (specn: 30 X MA)	D099-001-1-90-628 005 - 0105	24
4)	WASHER M85.2-H11 1-PV-628-00556/01	As per given Drawing (specn: 30 X MA)	D149-001-1-90-628 003 - 1004	05
5)	PLATE-3 1-PV-628-00556/01	As per given Drawing (specn: SA516Gr70)	D099-001-1-90-628 019 - 3201	04
6)	DISC-5 1-PV-628-00556/01	As per given Drawing (specn: SA516Gr70)	D099-001-1-90-628 025 - 3207	04
7)	BUSH-7 1-PV-628-00556/01	As per given Drawing (specn: SA516GR70)	D149 to D150-001-1-90-628 026 - 03208	04
8)	STUD-M85 X 3 1-PV-628-00556/01	As per given Drawing (specn: 38XH3MØA)	D149 to D150-001-1-90-628 020 - 0201	04
9)	NUT- M85 X 3 1-PV-628-00556/01	As per given Drawing (specn: 38XH3MØA)	D149 to D150-001-1-90-628 021 - 0211	04
10)	SLEEVE-5 1-PV-628-00556/01	As per given Drawing (specn: 38XH3MØA)	D099-001-1-90-628 023 - 3205	04
11)	TEST COUPON	As per Std.F519-13 (specn: 38XH3MØA)	D149-001-1-90-628 111 - 9301	02
12)	TEST COUPON	PL 5x75x50 (specn: SA516GR70)	D149-001-1-90-628 111 - 9302	02

SCOPE OF OPERATIONS:

- 1) Collection of components in 2 lots from BHEL with relevant documents.
- 2) The approved procedure (attached with this enquiry) for Zinc Phosphate coating will be provided by BHEL; No deviation from the procedure is permitted at any stage of processing.
- 3) Preparation of detailed Operation Process Sheet (OPS) indicating each stage of operation and inspection checklist as detailed in the given procedure; The OPS shall be submitted for approval from BHEL & BARC.
- 4) Carrying out trails for establishment of Zinc Phosphate Coating as per supplied procedure :
 - a. **For Threaded Items:** Carry out mock-up phosphate coating on **one number** each of SI No.02, SI No. 08 and SI No. 11 (test coupon for 38XH3MØA) to establish the process parameters.

Report coating density, thickness of coating, Go/No-Go Gauge checking results of threads for review. Coating thickness shall be controlled for Go & No-Go gauge acceptance. All threaded components are made as per tolerances given in the drawing and checked with Go & No-Go gauges.

- b. **For Non-threaded Items:** Carry – out mock-up phosphate coating on **one number** each of SI No. 06 & SI No.12 (Test Coupon for SA516Gr70) to establish the process parameters. Coating thickness to be recorded for information; the test coupon loaded along with the job shall meet salt spray test.

NOTES:

1. Test coupon for the specification 38XH3MØA will be supplied as per sketch shown in Std. F519-13; Test coupon for SA516Gr70 will be supplied as PL 5x75x50 (mm); No separate test coupon for 25X1MØ (one number of SI No.2 shall be taken)
2. After trial phosphating, for removal of coating if any, only mechanical means shall be employed.
- 5) After obtaining clearance on test coupons/mock-ups from QC-BHEL & QS-BARC, Carry out Zinc phosphate coating on all other components as per approved OPS & procedure
- 6) Final acceptance of components by QC / BHEL & QS / BARC
- 7) Lab testing of test coupons will be done by BHEL before proceeding for further operations. Movement of test coupons to BHEL is in the scope of sub-contractor.
- 8) The finished components shall be properly packed to protect the threaded surfaces and safely dispatched to BHEL–Tiruchy-14 along with all the cleared documents.

NOTES:

- 1) Offer should be submitted on **Rate / piece** basis for each SI. No. 'L1' offer will be evaluated for the combined value of all the SI.No.
- 2) The job should be taken up only after obtaining clearance on test coupons as specified in the OPS. All the stage inspection and final inspection reports including Operation Process Sheet are to be handed over to OP&C – ATP / BHEL after completion
- 3) Transportation of jobs on both ways is in the scope of sub-contractor.
- 4) Clause 2.2 of the Zinc Phosphate coating procedure does not come under sub-contracting scope
- 5) All the materials shall bear identification details or suitable tags with QC/BHEL & QS/BARC stamp or signature at all stages
- 6) Care to be taken to avoid any damage on components during handling or transportation
- 7) Online IR shall be raised through Vendor Information System (B2B portal) of BHEL-Trichy and after getting clearance, the job shall be dispatched through online DC
- 8) The Invoice (Three copies) shall be addressed to Dy. General Manager / Finance and the same may be routed through DGM / Subcontracting / ATP

DELIVERY SCHEDULE: Within 25-days from the date of material collection.

V. Senthil Kumar
21.06.16
Engineer


Sub-contracting / ATP

SENTHILKUMAR

Engineer

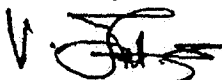
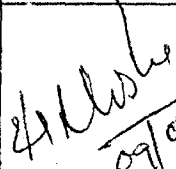
ATP / Sub-contracting

BHEL TIRUCHY

	<p>Bharat Heavy Electricals Ltd. Tiruchirappalli 620014 Advanced Technology Products Operation Planning & Control</p>	<p>OP&C: PROC:RPVB1B2:007</p>
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PROCEDURE FOR ZINC

PHOSPHATE COATING

Revision Number & DT	Description	Prepared By BHEL	Reviewed By (BHEL)	Approved By (BARC)
00 28-05-11	Procedure for Manganese Phosphate coating clause 1.0 to 16.0 approved (page 1 to 10)	H.NAGARAJAN	L.GRAGORI	Sd/-
01 03-10-11	Procedure changed to Zinc Phosphate coating clause 1.0 to 16.0 approved (page 1 to 11). Procedure no given	H.NAGARAJAN	L.GRAGORI	Sd/-
02 22.04.2016	List of items in Annexure-I & II updated as per design change for TCA-B2	SANJAY KUMAR	Dr.V.Rajasekharan 	 09/05/16

Arul Anand Das
09/05/2016.

1. Scope

This procedure details the process of Zinc Phosphate coating followed by supplementary oil treatment for components made of Carbon steel & Low Alloy steel.

Applicable specifications: -

- Phosphate coating process – IS 6005
- Testing and Inspection – IS 3618, IS 1367

~~Refer Annexures 1 & 2 for list of components to be Zinc phosphate coated.~~

Refer Enquiry for list of components to be zinc phosphate coated.

2. Quality Control

- 2.1. Details of the chemicals, test methods and the equipment proposed to be used shall be submitted by the firm while giving the offer. The exact designation of all proprietary materials proposed for use shall be stated in offer.
- ~~2.2. All machined components shall have been subjected to LPT prior to coating.~~
- 2.3. The offer shall include a detailed method of control, with limits for time, temperature and pH values, and all other pertinent details that will ensure compliance with the requirements of this Procedure.
- 2.4. No deviation from the approved Procedure shall be permitted without prior written approval of BHEL and Customer/QS.
- 2.5. Process parameters shall be established by the phosphating firm initially on mock-up coupons provided by BHEL. Mock-up coupons are representative of actual job materials.
- 2.6. Phosphating process, Testing and Inspection shall be carried out in the presence of BHEL/QC and Customer/QS.
- 2.7. Only after process parameters have been established on mock-up coupons and accepted by BHEL and Customer/QS, job production can be taken up.
- 2.8. Production Test coupons supplied by the manufacturer shall be processed concurrently with each batch of job and shall be sufficient to conduct inspection/testing as per paragraph no. 4.0 of this procedure. Only when results of testing conducted on Production Test Coupons in the presence of BHEL and Customer/QS are satisfactory, it can be concluded that phosphate coating process is satisfactory. Actual job shall also be subsequently inspected as per paragraph no. 4.0 of this procedure. Spare quantity of job identified by Purchaser can be taken as Production Test Coupons.
- 2.9. Approval of process, materials and equipment implies no guarantee of acceptance of the results obtained after testing. Acceptance of the test results for Production Test coupons does not guarantee acceptance of the phosphate coating on components and component will be accepted only after complete inspection of the same. Test specimens shall be used only once and then preserved only for records.

- 2.10. Care shall be taken at all stages to prevent contamination of the surfaces being treated by touching with bare hands, splashing with undesirable liquids or the condensation of moisture on parts after drying.
- 2.11. Care must be taken to ensure that parts are kept in process baskets/pallets such that air entrapment in part internals is minimized during bath immersion.
- 2.12. Carryover of solution from one chemical process tank to next shall be totally avoided.
- 2.13. The process salt solutions and rinsing water shall be analyzed regularly as per IS 6005.
- 2.14. Audit checks on mass of coating shall be carried out once in a week using carbon steel test coupons of 3"x 2" (approximately 75 x 50 mm) processed along with the components.

3. Phosphating stages

- 3.1. Consecutive stages shall follow one another without delay.
- 3.2. Major stages along with the associated equipment are listed below:

Stage	Equipment
I - Pre-treatment	Electric Furnace (applicable only for material grade 38XH3MΦA)
II - Surface preparation	Degreasing tank, Rust and scale removing solution tank
III - Water rinsing	Cold water tank (with constant water overflow)
IV - Activation rinse	Activation rinse tank
V - Phosphating	Phosphating tank (SS), heated by gas, steam or electricity
VI - Rinsing	Running water and Hot Chromic acid rinse tank
VII - Drying	Compressed air or Drying oven
VIII - H ₂ Embrittlement relief	Electric Furnace (applicable only for material grade 38XH3MΦA)
IX - Supplementary treatment	Oil immersion
X - Packing	Packing as per approved procedure

3.3. Stage I - Stress relief HT (Pre-treatment for high strength steels)

- 3.3.1. Steels of specification 38XH3MΦA shall be given stress-relieving treatment before phosphating.
- 3.3.2. The parts should be heated for at least 30±10 minutes at a temperature of 190±10°C.
- 3.3.3. Minimum duration of heating – 1 hour for every 25.4 mm (1 inch) of thickness but not less than 0.5 hour for thicknesses less than 12.7 mm (0.5 inch).

3.4. Stage II - Surface preparation

- 3.4.1. Before processing, all scale, rust, grease oil & foreign matter shall be removed from surface to be treated by a method, or combination of methods, suitable for meeting the requirement.

- 3.4.2. Choice of the appropriate process depends upon the type and degree of contamination and the size and shape of the parts. Method of cleaning or a combination thereof shall be finalized after discussions with Purchaser.
- 3.4.3. For material grade 38XH3MΦA, non-electrolytic alkaline or anodic alkaline cleaners or mechanical cleaning procedures are preferred to avoid the risk of producing hydrogen embrittlement during cleaning.
- 3.4.4. At the end of immersion, the items shall be lifted above the solution level to allow draining of excess chemicals.

3.5. Stage III - RINSING AFTER DEGREASING AND RERUSTING

- 3.5.1. Items shall be rinsed thoroughly in cold water rinsing tank both after de-scaling and after de-rusting. Items shall be drained of excess water.
- 3.5.2. Care should be taken to ensure that the water supply itself is sufficiently free from harmful salts as given below:
- a) 100 ppm total chlorides (calculated as Cl^-)
 - b) 200 ppm total alkalinity (calculated as $CaCO_2$)
- 3.5.3. Adequacy and effectiveness of cleaning shall be demonstrated on the mock-up coupons. Cleaned components are to be offered to BHEL and Customer/QS before any further processing.

3.6. Stage IV – Activation Rinse

Components after rinsing shall be subjected to activation rinse.

3.7. Stage V - ZINC-PHOSPHATING PROCESS

- 3.7.1. Method of application – Immersion only.
- 3.7.2. Phosphate coating treatment shall be carried out as per agreed operating instructions and chemicals such that all testing and inspection requirements are met.
- 3.7.3. At the end of the phosphating operation the items shall be lifted above the solution level to drain excess chemical.

3.8. Stage VI - RINSING AFTER PHOSPHATING

- 3.8.1. Items after phosphating operation shall be rinsed thoroughly first in running water and then in hot dilute chromate solution (temperature 60°C minimum).
- 3.8.2. Care should be taken to ensure that the water supply itself is sufficiently free from harmful salts as given below:
- c) 100 ppm total chlorides (calculated as Cl^-)
 - d) 200 ppm total alkalinity (calculated as $CaCO_2$)

3.9. Stage VII – Drying

- 3.9.1. Items after rinsing shall be forced dried thoroughly.
- 3.9.2. Precautions shall also be taken to avoid local accumulation of solid residues, such as may be formed on the surface, when hard water is used for rinsing. Special attention being paid to the parts that contain pockets crevices.
- 3.9.3. In case Compressed air drying is used, air should be dry and free from oil and dirt. The pressure of air shall not exceed 6.3 kgf/cm².

3.10. Stage VIII – Hydrogen Embrittlement relief (Only for material grade 38XH3MΦA)

- 3.10.1. Steels belonging to material grade 38XH3MΦA shall be given embrittlement relief treatment immediately after phosphating, rinsing & drying without any of the parts developing cracks. This treatment is to be conducted after coating before any stressing operation.
- 3.10.2. Heat treatment is to be carried out at 98 – 107 °C for 8 hours.
- 3.10.3. Hardness shall be checked on mock-up and production test coupons subsequent to heat treatment to determine any unacceptable reduction in hardness. In such circumstances, treatment may be carried out at a lower temperature, but not less than 130°C, for a minimum period of 8 hours. It may be noted that a low temperature treatment can adversely affect the fatigue strength of the article.

3.11. Stage IX – Supplementary Treatment

- 3.11.1. Sealing of the phosphate coating shall be carried out using **inorganic** oil or lubricant as per approved grade.
- 3.11.2. Organic oils/lubricants are not permitted.

4. Inspection & Testing

4.1. Process Examination

- 4.1.1. The entire phosphate coating process along with the associated inventory shall be subject to examination at the discretion of representatives from BHEL/QC and Customer/QS to verify conformance with this Procedure.
- 4.1.2. Sampling for process control testing shall be subject to the approval of the representatives from BHEL/QC and Customer/QS. The sampling plan shall be sufficient to demonstrate adequate control of the process and conformance of products processed.
- 4.1.3. Tests shall be performed at the frequency established from mock-ups and approved by representatives from BHEL/QC and Customer/QS.

4.2. Surface texture

Coated items shall be free of defects as per paragraph 6.1 of IS 3618.

4.3. Dimensions of coated items

4.3.1. Coating weight is a requirement while thickness values are simply guidelines. Expected thickness of ~~phosphate~~^{Zinc} phosphate coatings is 5 to 10 microns. Suitable pre-coating allowance shall be provided for threaded items in machining stage.

4.3.2. Threaded items shall answer GO and NO GO gauges as per ISO 1502 after coating.

4.4. Visual Tests

Method of visual examination of items and acceptance shall be as per paragraph 6.2 of IS 3618.

4.5. Test for coating weight

4.5.1. Method of testing coating weight shall be as per paragraph 6.3 of IS 3618.

4.5.2. The weight of phosphate coating shall be a minimum of 7.5 grams per square meter (g/m²). Upper limit on coating weight is governed by meeting dimensional requirements of drawing.

4.6. Test for resistance to corrosion

4.6.1. Mock-up coupons shall be subjected to 5% salt spray (fog) test for determination of accelerated corrosion resistance as per ASTM Test Standard B117.

4.6.2. Exposure time of coatings for salt spray shall be 72 hours. No evidence of corrosion for the above specified time shall be seen.

4.7. Test for Corrosive residues

Method of testing rinsing efficiency and acceptance shall be as per paragraph 6.4 of IS 3618.

4.8. Test for presence of Phosphate coating

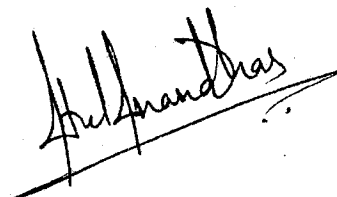
Method of testing and acceptance shall be as per Appendix A of IS 1367.

5. Packing and Documentation

5.1. Phosphate coated products shall be individually packed in polyethylene cover or wrapped in oil paper followed by soft packing so as to avoid any damage during handling or shipping. Parts/articles cleared for shipment but found damaged after receipt shall be accounted as "Rejected". Marking of items shall be on tag.

5.2. The following completed documents for mock-up, Production Test Coupons & actual job shall be supplied along with the job: -

- OPS, Inspection and Testing records
- Process parameters & Phosphating log records
- Stress relief and Hydrogen embitterment relief treatment records



Annexure ILIST OF COMPONENTS FOR PHOSPHATE COATING (RPV-B1B2)

Sl. No.	Component	Material Group	Material grade	Qty (nos.) *	Individual Weight (grams)	Total Weight (kgs.) *	Min. increase in weight after phosphating (milligrams)	BHEL Drawing No. *	Threads available on component
1	BOLT Var. 1 BOLT Var. 2	Group A (UTS < 1000 Mpa)	25X1MΦ	98 24	50 200	19.6 19.2	40 100	4-90-628-00140 & 4-90-628-00141	M12 – 6g M20 – 6g
2	WASHER Φ120.2H12		30XMA	24	6000	288.0	1300	3-90-628-00827	NONE
3	WASHER Φ85.2H11		30XMA	04	1171	9.368	300	4-90-628-00145	NONE
4	PLATE – 3		SA 516 Gr. 70	04	5	0.04	25	4-90-628-00144	NONE
5	DISC – 5		SA 516 Gr. 70	04	453	3.624	250	4-90-628-00148	NONE
6	BUSH – 7		SA 516 Gr. 70	04	281	2.248	320	4-90-628-00149	NONE
7	STUD M85	Group B (UTS ≥ 1000 Mpa)	38XH3MΦA	04	13800	110.4	3200	3-90-628-00895	M85 x 3 – 6g
8	NUT M85		38XH3MΦA	04	3427	27.416	960	3-90-628-00896	M85 x 3 – 7H
9	SLEEVE – 5		38XH3MΦA	04	4886	39.088	2800	4-90-628-00146	NONE

* - columns not applicable for sub contractors.

OP&C: PROC: RPV-B1B2: 007

Procedure for Zinc Phosphate coating

Subhandhas

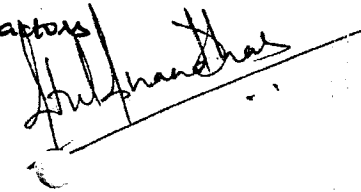
Annexure IILIST OF COMPONENTS FOR PHOSPHATE COATING (RPV-B2)

SJ. No.	Component	Material Group	Material grade	Qty. (nos.) *	Individual Weight (grams)	BHEL Drawing No. *	Threads available on component
1	BOLT VAR. 1	Group A (UTS < 1000 MPa)	25X1MΦ	148	50	3-90-628-01245	M12 – 6g
2	BOLT VAR. 2		25X1MΦ	48	200	3-90-628-01245	M20 – 6g
3	WASHER Φ120.2H12		30XMA	24	6000	3-90-628-00827	NONE
4	WASHER Φ85.2H11		30XMA	04	1171	4-90-628-00145	NONE
5	PLATE – 3		SA 516 Gr. 70	04	5	4-90-628-00144	NONE
6	DISC – 5		SA 516 Gr. 70	04	453	4-90-628-00148	NONE
7	BUSH – 7		SA 516 Gr. 70	04	281	4-90-628-00149	NONE
8	TAB WASHER (VAR. 05)		IS 513	16	4	3-90-628-01246	NONE
9	BOLT M6-6g		SA 105	08	7	4-90-628-00150	M6-6g
10	BOLT M10-6g		SA 105	16	26	4-90-628-00153	M10-6g
11	PIN		SA 516 Gr. 70	04	1	4-90-628-00152	NONE
12	STUD M85	Group B (UTS ≥ 1000 MPa)	38XH3MΦA	04	13800	3-90-628-00895	M85 x 3 – 6g
13	NUT M85		38XH3MΦA	04	3427	3-90-628-00896	M85 x 3 – 7H
14	SLEEVE – 5		38XH3MΦA	04	4886	4-90-628-00146	NONE

* - columns not applicable for sub-contractors

OP&C: PROC: RPVB2: 007

Procedure for Zinc Phosphate coating



Sl. NO. 11 - Test coupon for 38XH3M φA.

ANNEXES

(Mandatory Information)

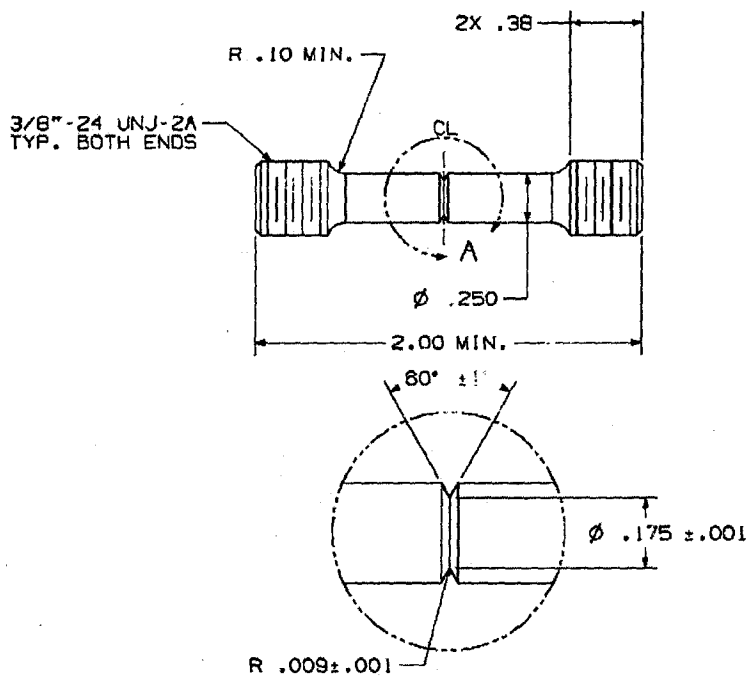
A1. SPECIAL REQUIREMENTS FOR THE TESTING OF NOTCHED ROUND TENSION SPECIMENS

A1.1 *Type 1a*—The notched round tension specimen is given in two sizes. If the specimen geometry is not called out, the Type 1a.1, standard notched round specimen under load control, shall be used.

A1.1.1 *Type 1a.1 Standard*—The dimensions for the standard sized specimen for the sustained load test (SLT) are shown in Fig. A1.1. The test machine shall have a minimum load capacity of 10 kips to measure the NFS in accordance with Table 1. Correspondingly, a test machine with a minimum load

capacity of 7.5 kips is required to maintain a sustained load of 75 % of the NFS in accordance with Table 3.

A1.1.2 *Type 1a.2*—The dimensions for the oversized specimen for SLT are shown in Fig. A1.2. The test machine must have a minimum capacity of 16 kips to measure the NFS in accordance with Table 1. Correspondingly, a minimum 12-kip test machine is required to maintain a sustained load of 75 % of the NFS in accordance with Table 3.



DETAIL A

Tolerances unless otherwise specified:

- X.X ± 0.1
- X.XX ± 0.03
- X.XXX ± 0.005

NOTE 1—Specimen preparation must comply with 9.2.

NOTE 2—Surface finish of notch shall be 32 RMS or better, all other surfaces shall be 63 RMS or better.

NOTE 3—Configuration of the ends of the specimen is optional so long as any external threaded ends have the minor diameter greater than 0.25 inch.

NOTE 4—Root radii, reduced section, and notch root radius must be concentric with centerline of specimen within 0.002 T.I.R. (total indicated runout).

FIG. A1.1 Dimensional Requirements for the Type 1a.1 Specimen



BHARAT HEAVY ELECTRICALS LIMITED

TIRUCHIRAPPALLI - 620 014

SUB CONTRACTING / ADVANCED TECHNOLOGY PRODUCTS

ANNEXURE-A

TERMS & CONDITIONS TO ENQUIRY 626005E Dt. 21.06.2016

1. The tender will be operated on two part bid basis i.e.
 - I. Techno-Commercial Bid &
 - II. Price Bid
2. The offer is to be submitted in a single envelope containing two envelopes. i.e. Part - I (Techno Commercial Bid) and Part - II (Price Bid)
3. **Part – I (Techno-Commercial Bid):**
 - I. Duly Signed Tender Documents
 - II. Duly signed Annexures – A&B (Terms and Conditions & Important Points for Attested material processing)
 - III. Duly filled & signed Annexure – C (Techno-Commercial Bid)
 - IV. Signed and filled Annexure – N (*Applicable for New Vendors only*). Supporting documents should be submitted along with this bid)

This Part – I document should be sealed in a separate envelope by clearly marked “Part I – Techno - commercial bid” indicating Enquiry No., Due Date., address & reference of the bidder.

4. **Part – II (Price Bid):**
 - I. Duly filled and signed Quotation – Include all the costs and quote as **Rate per piece** basis (in Rs.) for each Sl.No. as in Annexure -1

This price bid should be sealed in a separate envelope by clearly marked “Part II – Price bid” indicating Enquiry No., Due Date., Address & reference of the bidder.

5. It is requested to put the above two envelopes (Techno-Commercial Bid & Price Bid) inside a separate larger sealed envelope and this envelope shall be super scribed as “Techno-Commercial Bid and Price Bid “ for Enquiry No. 626005E Dt.: 21.06.2016 Due Dt.:12.07.2016
6. The offer should be addressed to:

**Deputy General Manager
Sub-contracting / ATP
2&4 Building (First Floor)
Bharat Heavy Electricals Limited
Tiruchirappalli - 620 014**
7. Any clarifications related to the enquiry should be addressed to nrs@bheltry.co.in or vsenthil@bheltry.co.in and NIT or Enquiry number should be mentioned in the subject. Any clarifications without the reference of tender number in the subject will not be entertained.
8. Any techno commercial clarifications/request for tender due date extensions with valid acceptable reasons to be addressed to BHEL prior to 48 hours of tender due date. BHEL reserves the rights to extend the due date as per their discretion.
9. Tenders should be free from CORRECTION AND ERASURES. Corrections if any must be attested; all amounts shall be indicated both in words as well as in figures. Where there is difference between amount quoted in words and figures, amount quoted in words shall only be considered.

10. Discrepancy in “Words “& “Figures “

- a. If, in the price structure quoted for the required goods/services/works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of BHEL there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
- b. If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
- c. If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject of (a) and (b) above.

11. Taxes & Duties:

All taxes, duties, service taxes etc. if payable as extra to the quoted price should be specifically stated in offers along with CST & TIN No / Tariff no. etc., failing which BHEL will not be liable for payment of such taxes and duties. Our TIN No: 33243560005, TNGST No: 356005, CST No: 239383 dated 11-06-1991 & BHEL ECC No: AAACB4146PXM012. Assessment circle: Thiruverumbur.

Excise duty and Sales tax if any will be paid in Full for each part payment, based on supporting documents.

12. The quoted rates shall be valid for at least **6 months** from the date of price bid opening. The quoted/Finalized rates shall be Firm till completion of the supplies.
13. On the due date of tender opening, only the technical bids will be opened. Technical bids will be evaluated by BHEL and clarifications required, if any, will be called for from the bidders on technical and commercial points. The price bids of techno-commercially suitable bidders will be opened on a later date with prior intimation to respective bidders.
14. Lowest price received against BHEL tenders need not be the technically acceptable one and in that case BHEL reserves the right not to consider the same. The purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any tender in part or full without assigning any reason whatsoever.
15. BHEL reserves the right to negotiate or re-float the tender opened if L1 price is not the lowest acceptable price to them inter-alia other reasons.
16. BHEL deserves the right to increase or decrease the tendered quantity.

17. Risk Purchase:

BHEL at its option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or dispatch within the time stipulated as aforesaid or if the same were not available, the best and the nearest available substitute thereof. The supplier shall be liable for any loss which BHEL may sustain by reason of such risk purchases in addition to LD at the maximum rate mentioned in the LD clause above.

18. Bidders **not confirming to the enquiry specification mentioned will be disqualified.**

19. Any corrigendum related to the enquiry will be hosted in the BHEL website only, Bidders should visit the website to keep themselves updated.

20. The correspondence between the bidder and BHEL through email is considered as valid document legally though not signed. It is treated as valid confirmations made on behalf of the respective company and comes under the legal ambit of the business transaction and hence binding on both the parties.

21. Bidders participating in the tender should declare in their technical bid whether they have been black-listed / kept on hold / given Business holiday for a specified period by any Public Sector Undertaking or Government Departments. The reasons for such action with details and the current status of such hold shall be clearly furnished to BHEL. If no such details are mentioned in the offer, it will be construed that the bidder is not under any such hold. However, at a later date if it comes to the notice of BHEL about any such hold under enforcement, BHEL reserves the right to reject the offer at any point of time and also under any stage of the finalization of the tender. Such bidders will not be permitted to participate in the further tender proceedings and will be communicated suitably.

22. Issue of Materials:

- a. The raw materials are to be collected from BHEL by the vendor at his cost
- ~~b. The raw materials will be supplied at your works at our cost.~~

23. Bank Guarantee:

You will have to execute a Bank guarantee for the value of **Rs.25,000/- (Twenty five thousand rupees)** towards satisfactory performance of the order and for the safe custody of the raw materials. The guarantee shall be executed on a Non-judicial stamp paper of value Rs.100/- and shall be kept valid for a period of one year against the orders already placed and to be placed by BHEL. All bank charges will be to the supplier's account.

In case any bidder does not accept for submission of Bank guarantee, their offer is likely to be rejected. However, in case of any vendor having a valid Bank Guarantee executed for any of the previous ATP/Sub-contracting orders, the same shall be used for this tender provided the existing BG value is not less than the requirement (cumulative value including the POs for which the deliveries are not completed) specified above.

24. Manufacturing of Components:

- a. The items are to be strictly manufactured as per Scope and drawing / OPS.
- b. Attestation procedure is to be followed wherever required as per Annexure-B

25. Inspection of Components:

- a. Stage or final Inspection of the components will be done by BHEL/Customer Inspection agencies for which a register for dimensional report shall be maintained at your works and you have to provide all the required facilities Free of Cost. The Inspection results should be given in the format specified by QC/BHEL and necessary stage clearances should be obtained as mentioned in OPS.
- b. The items requiring first off clearance for bulk production shall be offered for Inspection immediately after sample pieces have been completed. Only on getting the approval from our Inspector and authorised representative in writing, further work on bulk production is to be started.
- c. In case of partial or full raw material supply by BHEL for rejection due to our raw materials defect, we will allow proportionate payment to the extent of machining carried out.

26. Painting & Packing of components:

- a. All the machined surfaces or threaded surfaces are to be carefully packed to avoid any damage during transportation

N. Senthil
21.06.16

- b. Supplier's code number allotted by us should be punched and encircled with white paint on the finished components wherever possible. In case of small items, metal tags shall be prepared for the same.
- c. Any deviation from the scope of machining shall be suitably painted on the component at the appropriate place.
- d. Wherever our work orders specified in the Purchase order, the details of Work Order Number, Du-Part Number, Quantity Numbers and weight in Kgs., apart from the IR. No., Should be painted in white paint on any prominent surface of the component or on a metal tag of size 100x175 mm for smaller items, initially applied with Red oxide primer to IS2074 and further applied with a coat of Varnish to avoid peeling off the paint.

27. Accountability of raw materials:

Balance of raw materials will be accounted on completion of the order. ~~Balance materials will have to be returned by you to BHEL Stores. Turnings and borings / wastages are to be returned to BHEL Stores.~~

~~Turnings and borings / wastages need not be returned to our Stores. You may give due Credit to the value of the same in your quotation and accordingly quote.~~

28. Delivery of Components:

- a. The finished goods should be delivered to BHEL/Trichy by the vendor at his own cost
- b. The Delivery challan should be prepared for each Purchase order / Work order separately as per our Proforma or online through B2B (Vendor information system)
- c. The consignment should accompany sufficient copies of online IRs & DCs as mentioned in the B2B (Vendor information system)
- d. The rejected items due to material defect are to be despatched by the vendor to BHEL on "Freight to pay basis" through any of our approved transport carrier along with 3 copies of PDO, one copy of IR and 4 copies of Delivery challan.
- e. The rejected items due to faulty workmanship at vendors end are to be delivered to BHEL at his own cost

29. Payment:

Payment for 100%, ~~90%~~ will be made after 45 days from the date of receipt of finished goods and against the Inspection report (IR) (when the finished items are supplied whether partially or fully to BHEL) supported by:

- a) Two copies of your delivery challan acknowledge by our Stores / Shop
- b) Material accountal Statement for BHEL supplied material / FIM
- c) Invoice of three copies, addressed to DGM/Finance and routed through DGM/SC/ATP
- d) ~~Balance 10% last payment shall be made only on completion of the order after duly accounting for rejections, short supplies (if any) and return of raw materials.~~
- e) Payment of proportionate machining charges for the rejected pieces due to material defect will be made against your Invoices in duplicate supported by 2 copies of IR. & Delivery challan acknowledged by our stores.

30. LD Clause:

Liquidated damages shall be 0.5% of the total order value per week or part thereof subject to a maximum of 10% of the total order value.

For staggered delivery schedule, LD shall be 0.5% of the undelivered portion per week of delay or part thereof subject to a maximum of 10% of the total order value.

Waiver of LD may be considered under special circumstances based on the return request from the vendor.

31. Return of Documents:

All the documents of BHEL including drawing/approved procedures made available to the vendors should be kept in strict confidence and under no circumstance be made available to others or allow others to make use of them. Such documents shall be returned to us on demand after completion. This secrecy clause is binding on the employees of the fabricators also. Any contravention will be subjected to legal action, besides suspending business with BHEL.

32. Any dispute arising out of or in connection with this Agreement shall be finally settled by binding arbitration in accordance with the Arbitration and Conciliation Act, 1996 as may be amended from time to time. Executive Director / BHEL, Trichy – 620 014 or his authorized representative shall be the Sole Arbitrator and his decision shall be final and binding on both the parties. The place of arbitration shall be Tiruchirapalli, and the language shall be English. The courts at Tiruchirapalli shall have exclusive jurisdiction on any dispute arising out of or in connection with this Agreement, if intervention of court is warranted, subject to the arbitration provided above.

V. Senthil
Engineer 21 Oct 16

Sub-Contracting/ATP

SENTHILKUMAR. V
Engineer
ATP - Sub-contracting
BHEL, TIRUCHY - 620 014



BHARAT HEAVY ELECTRICALS LIMITED

TIRUCHIRAPPALLI - 620 014

ADVANCED TECHNOLOGY PRODUCTS / SUB CONTRACTING

ANNEXURE - B

IMPORTANT POINTS TO BE NOTED WHILE PROCESSING THE ATTESTED MATERIAL

- 01 Raw material should not be taken up for machining/processing without attestation card.
- 02 The details given in the Attestation card should tally with the details punched on the raw material along with Inspector's seal.
- 03 Before gas cutting/hacksaw cutting/machining, attestation particulars are to be transferred to individual pieces along with BHEL Inspector's seal.
- 04 BHEL Inspector alone is authorised to put his Seal on attested material.
- 05 The following details should be punched each component. If the components are too small, the details may be punched on a Metal Tag and tied after consulting our Inspector.
 - A) Attestation card numbers.
 - B) Material specification.
 - C) Melt number
 - D) BHEL's Inspector's Seal.
 - E) Firm code number.
- 06 Before taking up the raw material for processing, clearance is to be obtained in writing from our Inspector.
- 07 If any attestation particulars are removed during machining the same is to be transferred immediately on the machined area along with our Inspector's Seal.
- 08 Before punching, if it is not a machined area, the same is to be thoroughly cleaned by grinding, Sand blasting or at-least by wire brushing. At no circumstances, the attestation shall be made on mill or heat treatment scale.
- 09 Use only 3mm letter and number punch. The punching depth shall be uniform and legible.
- 10 The attestation details are to be clearly bordered with yellow paint. Bordering is to be done only after applying rust preventive oil.
- 11 Attestation card is to be sent to Stores along with despatch documents. If any part supply is made, a true copy of the attestation card duly signed by our Inspector is to be sent along with the despatch documents. In such case, the last consignment is to be despatched with original attestation card.
- 12 All useable materials and bits are to be returned to our stores bearing attestation details with our Inspector's Seal.
- 13 Before despatch Subcontractor should ensure that all the above points are followed without fail and ensure that the attestation details punched are correct.

20/10/2014
Senthil
Engineer 21.06.14

Subcontracting / ATP

SENTHIL KUMAR
Engineer
ATP / Sub-contracting
BHEL, TIRUCHY - 620 014

TECHNO-COMMERCIAL BID FOR 626005E dated 21.06.2016

ANNEXURE - C

PRE-QUALIFICATION CRITERIA (TECHNICAL REQUIREMENTS)

SL.NO.	DESCRIPTION	BHEL REQUIREMENTS	VENDOR CONFIRMATION / DEVIATION
01	EXPERIENCE IN ZINC-PHOSPHATE OR SIMILAR COATING TECHNIQUES	Only those vendors who have similar experience in doing these type of works should quote. <ul style="list-style-type: none"> • Proof shall be submitted in the form of recent (2014-2016) Purchase order or in any other form. • BHEL reserves the right to verify the information provided by vendor. In case the information furnished by vendor is found to be false / incorrect, the offer /P.O shall be rejected. 	
02	COMPLIANCE WITH THE PROCEDURE	The vendor should submit a detailed method of control, with limits for time, temperature and PH value and other pertinent details that will ensure compliance with the requirements of procedure	
03	EQUIPMENTS/CHEMICALS TO BE USED	Details of chemicals, inorganic oil or lubricant, test methods and the equipment proposed to be used shall be submitted by the vendor. The exact designation of all proprietary materials proposed for use shall be stated.	
04	TRIALS (TEST COUPONS)	Process parameters shall be established by the firm initially on test coupons; Job can be taken up only after acceptance of test coupons by BHEL & BARC	
05	CONFORMANCE TO STANDARDS	The vendor shall be familiar in following the code specification like IS6005, IS3618, IS1367, ASTM Test standard B117, etc	
06	FURNACE FOR PRE-TREATMENT	Electrical furnace (wherever applicable) must have valid calibration and certificate must be produced before use. Temperature recorder with chart also must.	
07	PROCESS REQUIREMENT	Tank used for phosphating stage shall be made of SS only. For each process/ treatment, separate tanks shall be used. Carryover of solution from one chemical process tank to next shall be totally avoided.	
08	TESTS & REPORTS	Hardness test on test coupon and Job shall be done at vendor work itself for which vendor should arrange portable hardness tester. Test reports shall be submitted as per procedures.	

NOTES :

1. The Vendor shall attach annexures and provide detailed explanation wherever necessary.
2. Only those vendors who are meeting the pre-qualification criteria shall be considered for further tender processes.

COMMERCIAL TERMS & CONDITIONS

SL.NO.	DESCRIPTION	BHEL REQUIREMENTS	VENDOR CONFIRMATION / DEVIATION
01	VALIDITY	Validity of the offer shall be minimum 6 months from the date of tender opening	
02	FREIGHTAGE (Consider transportation cost and quote accordingly; need not be separately specified in the quotation)		
	i) RAW MATERIAL	Material to be collected in 2 lots from BHEL, Trichy	
	ii) FINISHED COMPONENT (Packing & Forwarding)	Finished items in 2 lots to be properly packed and delivered to BHEL, Trichy	
03	TAXES & DUTIES	Refer point 11 of Annexure-A (Not applicable in general since it involves only conversion cost)	
04	PAYMENT TERMS	Refer point 29 of Annexure-A	
05	LIQUIDATED DAMAGES	Refer point 30 of Annexure-A	
06	BANK GUARANTEE	You have to execute a bank guarantee for Rs. 25,000/- before material collection	
07	DELIVERY SCHEDULE	Within 25 days from the date of material collection	
08	RISK PURCHASE CLAUSE	Refer point 17 of Annexure-A	
08	OTHER TERMS(IF ANY)	Movement of test coupons to BHEL for Lab testing is in the scope of sub-contractor	

Authorised Signatory with Seal

M. Senthil
21.06.16

ANNEXURE - N (For NEW VENDORS only)

SI No	Details	Document submission
1	Nature of ownership & relevant documents (Proprietorship-Professional Tax Regn & Municipal Regn; Partnership firm – Partnership Deed; Co-operative society – Society rules & bye laws ; Private/Limited Company – memorandum & Articles of Association)	
2	Contact Details (Person, Address, Mail & Phone numbers)	
3	Product or Service range & facilities: • List down the product range & specification details. • List of Manufacturing facilities/equipment's (including material handling facility)	
4	Licence details of the factory • Permanent Account No • Central Sales Tax registration number • State sales Tax / TIN number • Excise duty registration number • Excise control code number • Service tax registration number • Regn number of category as per MSMED Act (If applicable)	
5	If registered with any other BHEL unit • Letter of registration with BHEL unit (If applicable) • Proof of successfully executed or executing purchase orders	
6	Accreditation certificate for ISO:9001 / TOC of Quality System manual / ISO:14000 / OHSAS ISO 18000 (If applicable)	
7	Balance Sheet for the last three years along with the audit report	
8	EXPERIENCE IN SIMILAR TYPE OF WORK (All the new vendors should enclose a Purchase Order copy against their previous experience)	

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21/03/16

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