

**ENCLOSURE - 1**

**WORK PACKAGE FOR FIXING OF 55 MM THICK DETACHABLE RUBBER TILES  
BY FASTENING IN SONAR RECESS OF INS SINDHUKIRTI**

**A) Technical Specification for**

- 1.0 **Scope of work of Sub contractor:**
- 1.1 Description of work is as follows:
- a) Repair of old rubber tiles 570 No's (approx. 130 sq.m) of different sizes in range 200mmx200mm to 1000mmx1000mm as per defect survey reports. Repairs to be carried out in general is as per Annexure-I (in 2 pages)
  - b) Taking templates of old tiles (570 nos), check location using templates at site (sonar recess i.e. Spherical Bulkhead, keel area, both sides of the middle deck & both sides of the upper deck & Pressure Hull frames) and give identification numbers. For left over areas, mark location for new tiles (approx 30 sq. m) and make templates with identification number.
  - c) Preparation of new rubber tiles as per Annexure-II( 1 Page)
  - d) Removal of old fasteners, re-welding of new fasteners and fastening of all the rubber tiles (Approx. 160 sq.m) as per Annexure-III( 1 page)
- 1.2 AK-25 Qualified welders should be deployed by Sub-contractor for welding fastners.
- 1.3. Tools for cutting & drilling the rubber, templating material, Tools & Hollow punches for template cutting, hollow drill bits for rubber drilling, hollow drill bits for chamfering drill hole, 70 mm Ø magnets for fixing the templates on Sonar recess, putty knives, Bristle brush, disc brush, degreasing agent, waste cloth, Welding plant, grinding/buffing machine, Paper wheels, safety equipment, squeeze rollers, hand flypress, Emery papers, plastic caps/plugs for preservation of fasteners on board & misc. Consumables are in the contractor scope.

- 1.4. Work is to be carried out by sub contractor as per RTDs to the satisfaction of QC and WOT.
  - 1.5. Utmost care is to be taken for maintaining accuracy/RTD standards.
  - 1.6. Sub contractor shall provide labour assistance for carrying out DP tests by EKM-QC.
  - 1.7. Sub contractor shall rig the required staging onboard. .
  - 1.8. Sub contractor shall make arrangements for temporary lighting etc
  - 1.9. Sub contractor shall make arrangements (Trolleys, Bins, slings etc) for Collection of rubber tiles etc., from stores in HSL and handling.
  - 1.10 Sub contractor shall offer stage wise inspections to QC and WOT as per QAP issued by EKM-QC
  - 1.11 Remarks if any during inspections are to be rectified and reoffered for inspection by Sub contractor.
  - 1.12. Minor modifications if any as suggested by WOT and Russian specialists are to be carried out by Sub contractor without additional cost.
  - 1.13. All inspection reports and log book are to be maintained by Sub contractor and submitted to HSL immediately after completion of works.
  - 1.14. For preparation of sealant & putty calibrated digital weighing machine is to be arranged by the contractor
  - 1.15. Detailed documentation i.e., as fitted sketches are to be prepared frame station wise. ( 6 sets are to be submitted)
- 2.0 Scope of HSL supply:
- 2.1. 51mm Rubber tiles, 4mm rubber sheets, M10 Bosses, M10 Studs, M10 Hexagonal nuts, 50 mmØ washers (steel 20), 50mmØ Rubber washers, Sealant RDL-840(or) sealant YГ-2д , Putty эП-0010 or araldite, Glue 51-k-10BM & Glue 88C will be supplied by H.S.L.
  - 2.2. Ak-25 welding electrodes, D.P sets will also be supplied by H.S.L
  - 2.3. Sonar recess metal surfaces will be grit blasted and primer applied by HSL and made available for welding of fasteners. After welding of fasteners, the areas will be scheme painted by HSL and made available for fastening the rubber tiles.
  - 2.4. Staging materials supplied by HSL (subjected to availability) however staging to be erected by contractor.
  - 2.5. Crane will be provided by HSL for handling materials (subjected to availability)

- 2.6. One set of Drgs. Xerox copy will be provided by HSL and same are to be returned immediately after completion of works.
3. Ref. RTDs: 877ᄁP2-3230-032 to 877ᄁP2-3230-044
4. Prices are to be quoted per sq. mtr for the following categories of work
  - a) Repair of old rubber tiles including templating
  - b) Preparation of New rubber tiles including templating
  - c) Fastening of Rubber tiles including removal and re-welding of fasteners.

**REPAIR OF OLD RUBBER TILES(Both sides(Top, bottom) & edges ):**

1. As per the defectation survey Report, Repairs on 55mm Thk detachable rubber tiles (570 No's) are to be done by application of sealant YГ-2д (OR) RDL-840.

Repairs Rectification is as follows:

- 1.1 Repairs of mechanical damage less than 2mm deep and any of Width
- a. Roughen the damaged portion and tile surface for 10-15 mm from the edge of the damaged section with emery paper.
  - b. Clean the dust with vacuum cleaner or brush. Degrease with coarse calico pad dipped in benzene and dry the surface for 10-15 min.
  - c. Apply two coats of adhesive 88 c .Drying first coat for 20-30 minutes and followed by second coat.
  - d. Apply two coats of sealing compound RDL-840 (OR) YГ-2д t. Time duration between each coat is 24 hr's
- 1.2. Repair of Hair cracks from 2-7 mm deep on joints:
- a. Remove the sealing compound from the joint along the tile perimeter to a depth of 15mm and remove it fully if it separates.
  - b. Roughen the surface of tiles and joints.
  - c. Clean the dust with vacuum cleaner or brush. Degrease with coarse calico pad dipped in benzene and dry the surface for 10-15 min.
  - d. Apply first coat of adhesive 88C and dried not less than 20 min. Apply second coat of adhesive and dry it for not less than 3min.
  - e. With spatula apply two coats of sealing compound RDL-840 (OR) YГ-2д overlapping the edges; roughen the sealing compound with emery paper. Time duration between each coat is 24 hr's.
- 1.3. Repair of damages over 2mm deep& 20mm wide:
- a. Roughen the tile for 10-15mm from the edges of the damaged section.
  - b. Clean the dust with vacuum cleaner or brush. Degrease with coarse calico pad dipped in benzene and dry the surface for 10-15 min.  
the area of degreasing should be wider than the proposed area for application of sealing compound 30-50mm.

- c. Apply first coat of adhesive 88C and dried not less than 20-30 min. Apply second coat of adhesive and dry it for not less than 3min. width of adhesive coating should be more than the width of the sealing compound by 10-15 mm.
- d. With spatula apply two coats of sealing compound RDL-840 (OR) УГ-2д overlapping the edges; roughen the sealing compound with emery paper. Time duration between each coat is 24 hr's.

Reference documents: 1) Process sheet No: SKT/SEC-1/054 A

2) ND(V) Process sheet

3) RTD ГКЛИ.877ЭР2.3230-032

4) RTD ГКЛИ.877ЭР2.3230-040

5) RTD ГКЛИ.877ЭР2.3230-043

**PREPARATION OF NEW RUBBER TILE(55 mm thk,Approximately 30 sq.m):**

1. 51 mm thk Rubber, 4mm Monolithic rubber sheet are to be dried in heat chamber at a temperature of  $(45\pm 5)^{\circ}\text{C}$  during 2 hour s.
2. Roughening of 51 mm thk rubber & 4mm Monolithic rubber sheet.
3. Prepare the glue 51-k-10BM as per the document ГКЛИ.877ЭР2.3230-032.
4. Glue 51-K-10BM is applied on rubber surfaces with the use of round brush wrapped with gauge.
5. Glue 51-K-10BM applied on 51mm thk rubber tile in the following sequence as per Russian document ГКЛИ.877ЭР2.3230-037:
  - a. -Application of first layer with keeping time of 15-120 min.
  - b. -application of second layer with keeping time not exceeding 3 min.
6. Glue 51-K-10BM is applied on roll monolithic rubber in the following sequence Russian document ГКЛИ.877ЭР2.3230-037:
  - a. Application of first layer with keeping time of from 15min—6 h.
  - b. Application of second layer with keeping time of 15 min-120 min.
7. Paste the glued monolithic rubber (4mm) sheet on 51mm thk rubber tile & after pasting immediately pressed down the rubber with squeeze rollers in two mutually perpendicular directions.
8. Put the manufactured rubber in the hand -operated fly press for uniform pressing. Keeping time of rubber in the press is 48 Hours.
9. Cut the required new rubber tiles as per the shape of the template.
10. Drill the Holes in the New rubber as per the template.
11. The cutting edges of 55 mm rubber tile made free of dust with Bristle brush or dry cloth degrease with cloth, wetted in benzene and kept for 10 to 15 minutes.
12. The cutting edges of 55 mm rubber tile and holes surfaces shall be dressed up (coated) with thixotropic composition of УГ-2д sealant (or) RDL-840, using putty knives or Pneumatic syringe with flat end piece. Thickness of applied layer on tile edges & Holes edges shall be between 2-5mm. Roughen the sealing compound with emery paper to maintain the 5mm gap between the rubber tiles.

Refer Documents:            ГКЛИ.877ЭР2.3230-033,            ГКЛИ.877ЭР2.3230-034,  
     ГКЛИ.877ЭР2.3230-037, ГКЛИ.877ЭР2.3230-032  
     ГКЛИ.877ЭР2.3230-043, ГКЛИ.877ЭР2.3230-035

**FIXING OF 55 mm rubber by FASTNING:**

1. Remove the old M10 Bosses/M10 studs by cutting & Grinding.
2. Take the D.P in the area of Grinding (for Metal AK-25).
3. Refit & weld M10 bosses/studs in the same location for old tiles.
4. For the new tiles, as per template weld the New M10 Bosses & M10 Studs on spherical Bulk head, keel area, both sides of the middle deck, both sides of the upper deck & PH Frames(i.e Total Sonar Recess Area).
5. Carry out the D.P test at M10 Bosses (Nuts)/M10 Studs welded area in sonar recess area.
6. After welding, M10 Bosses position is to be transferred on to the new rubber tile using template and holes are to be drilled to the new rubber tile (Identification number wise).
7. Fasten the 55mm rubber tile in the identified locations.
  - a. Put the washers on the studs and screw the nuts. Tighten the nuts with screw wrench to press the rubber to a depth of 3-4mm.
  - b. Minimum allowable gap between rubber tiles after fixing is only 5mm
  - c. The free end of stud and nut with washer shall be applied with priming compound эП-0010(putty).

**Preparation of Putty эП-0010 (Prime composition)as per Drg: 877ЭP2-3230-032:**

Putty paste -----100 grams

Hardner----- 8.5 grams

OR

**(Preparation of Putty (Araldite) as per ND(V)**

MY-750 Resin ----- 100 grams

HY 951 Hardener---- 10 grams

Iron oxide powder-----10 grams

Refer Documents: RTD's ГКЛИ.877ЭP2.3230-032, ГКЛИ.877ЭP2.3230-038,  
and andГКЛИ.877ЭP2.3230-044

**B - COMMERCIAL TERMS & CONDITIONS**

1. **TIME SCHEDULE:** The completion time schedule is for **30 days** from the date of issue of rubber tiles.

2. **PAYMENT TERMS:**

2.1 **Stage –I :-** 90% Payment will be made for completed work against the submission of work completion certificate issued by the controlling department.

2.2 **Stage- II :-** Balance 10% payment shall be made on completion of guarantee Period.

2.3 The Bills shall be submitted along with PF & ESI clearance certificates for the personnel engaged for the period of work.

3. **PERFORMANCE BANK GUARANTEE** : 10% Performance Bank Guarantee to be submitted upto the period of satisfactory completion of the work within 15 days of issuing LOI / Confirmatory Work Order.

4. **GUARANTEE PERIOD** : The preparation and fixing of rubber tiles must be guaranteed for 12 Months from the date of completion of total job. Any defects arising are to be attended to promptly and rectified at free of cost.

5. **DELAY IN COMPLETION OF WORK** : 0.5% per week subject to a maximum of 10% of the Work Order Value.

6. **GENERAL TERMS & CONDITIONS** : As per Enclosure – 2

7. **EMD : Rs.20,000/-** DD / Bankers Cheque from any Nationalised Banks on the name of Hindustan Shipyard Ltd. Visakhapatnam-530005, towards Earnest Money Deposit to be submitted along with Technical bid. (Returnable)

**Note:-** Vendors who were registered in HSL also should be submitted the EMD

8. **TENDER FEE : Rs.500/-** Vide Inside HSL State Bank of India Challan on the name of Hindustan Shipyard Ltd. Visakhapatnam-530005, (Branch No.9082), **Cr. HSL Current A/c No. 10299596073, (OR)** DD / Banker Cheque from any Nationalised Banks towards Tender Fee to be submitted along with Technical bid. (Non returnable)

**Chief Manager (SBO)**