



MAZAGON DOCK SHIPBUILDERS LIMITED

INVITATION OF EXPRESSION OF INTEREST FROM INDIAN OEM (ORIGINAL EQUIPMENT MANUFACTURERS ONLY) FOR INDIGENOUS DEVELOPMENT OF ITEMS ON NCNC BASIS

1	Department	Indigenization
2	EOI Ref No.	MDL/INDG/SUBMARINE/2022/01
3	EOI date	25/03/2022 (Open ended)
4.	ITEM	NBR O-ring and Gasket
5.	Description	Indigenous Development of NBR O-ring, Asbestos free fibre gasket and annealed copper flat & grooved gasket.

1. Mazagon Dock Shipbuilders Limited, Mumbai, Maharashtra invites Expression of interest from Indian manufacturers for long term participation in its Submarine Production programme and its life cycle management, by developing and manufacturing the item as mentioned above.

2. The brief scope is attached herewith as **Enclosure-1(A), (B), (C)**

3. INSTRUCTIONS TO THE BIDDERS:

Bidders must submit the following documents along with their offer:

- (i) Bidders Company profile and valid shop & Establishment registration certificate.
- (ii) List of equipment held by them with model/ year/ working status along with details of their manufacturing facilities and personnel with designation, qualification and experience to determine their capabilities.
- (iii) Audited / certified Balance sheet, Profit / Loss account for past 3 years and valid solvency certificate/ Banker's opinion issued by Nationalized / Reputed international / scheduled bank.
- (iv) ISO certification: Bidders should provide copy of valid ISO certification OR Demonstrate following through their documents in case of no availability of ISO certification
 - (a) Capability to control [as per STF (Technical specification) and norms] and get relevant and reliable results.
 - (b) Capability to master the production (to warranty traceability to control and register of the production process parameters, to raise deviation, to deliver upon full compliance, to set apart upon non-conformity).
 - (c) Production process complies within the requirement of the STF i.e. Technical Specification.
- (v) The bidders experience and past performance on manufacturing NBR O-ring, asbestos free fibre gasket and annealed copper flat & grooved gasket as their

products for last 2 years (order copies & work completion certificates to be appended.) for naval application.

- (vi) Draft quality Assurance plan (QAP) indicating all referred documents for inspection criteria inclusive of any stage inspection. The QAP should contain all the activities necessary to develop and produce the item including the raw material and the quality checks to be conducted and their acceptance criteria/ values. The QAP will be approved by MDL and concurred by Indian Navy(IN) [Document to be provided post factory assessment]
- (vii) Firm must indicate tentative lead time for manufacture and delivery of the item to MDL stores, from the date of placement of order.
- (viii) Any other documents considered relevant for the subject item.

4. Manufacturing facility of the shortlisted firms will be jointly inspected by MDL, IN and other stakeholder's rep. for ascertaining capacity and capability to undertake indigenous development of the item. Selected firms will be considered for development of the item based on need, following MDL's commercial procedures. This invitation of EOI is not an assurance for order.

5. **Inspection:** The item that has been developed and ready for inspection to the manufacturers satisfaction are to be offered for inspection by MDL and IN as per approved QAP. Any tests that are to be carried out in laboratory should be done from NABL accredited laboratory duly witnessed by IN & MDL.

6. **ILMS:** Post successful development of the product, details of the product along with manufacturer's item code and manufacturer's details are to be provided in IN's Integrated logistics management system (ILMS) format (will be provided by MDL) by the manufacturer's.

7. In case of any queries/clarifications please contact:

Mr. Deepak Chaudhari
Manager (Indigenization)
Tel Dir: 00 91 22 2378 2336
Board line: 00 91 22 2376 2704
E-mail - dchaudhari@mazdock.com

8. Interested parties should submit all the documents indicating name & designation of the undersigned on the cover at the following designated place;

**Office of the General Manager (Indigenisation)
3rd Floor Services Block (North yard)
Indigenisation Department
Mazagon Dock Shipbuilders Ltd,
Dock Yard Road,
Mumbai- 400 010**

We look forward to receive your offer against this expression of interest.

Your faithfully,
For **MAZAGON DOCK SHIPBUILDERS LTD.**

Deepak Chaudhari
M (Indigenisation)

Enclosure-1(A)

STATEMENT OF TECHNICAL REQUIREMENTS FOR O-RINGS FOR RUCH SEALING

1. **Functionality**. Rubber O-rings used in water, hydraulic fluids and hydrocarbons circuits in submarine
2. **Types of O-rings**. O-rings ranging from ring diam.1.8-7.0mm
3. **Material**. Butadiene acrylonitrile rubbers– (NBR) according to :
 - NF L17-120 classes 20A5 - 20A6 - 20A7 - 20A8 – 20A9,
 - NF L17-121 classes 21A6 - 21A7 - 21A8 – 21A9,
 - FD L17-100 / NF L17-106 for compounds complying with the requirements in NF L17-120 and NF L17-121.
4. **Manufacturing**. Obtained by compression, transfer or injection moulding.
5. **Qualification and acceptance tests**: According to NF L17-106
6. **Inspection**. By sampling According to NF ISO 2859-1 admissible quality level
NQA = 2.5 Critical defects are prohibited.
7. **Inspection Criteria**. Hardness inspection, Dimensional check, Mixes inspection, Visual inspection. Classification of the defects
8. **Shelf life**. According to NF L17-104 service life group II (NBR 20A).
Observe the curing and expiry dates of the cured products.
9. **Inspection certificate to be Supplied upon delivery**. Inspection sheet according to NF L17-106 with compound batch number for each order statement.

Enclosure-1(B)

STATEMENT OF TECHNICAL REQUIREMENTS FOR ASBESTOS FREE FIBER JOINTS/SEALS

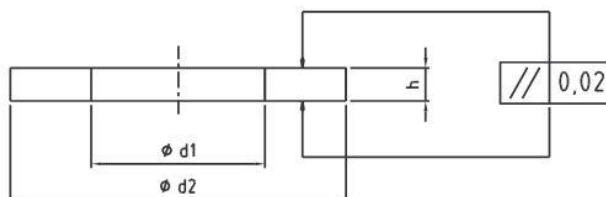
1. **Functionality**. Cut seals made from Asbestos free fibers, for use in the fluid circuits for adaptors & plugs.
2. **Types of Seals**. Requirement exists for two types of Seals: -
(a) 2mm thick (b) 3mm thick
3. **Seal Material**. Asbestos free fibre
4. **Construction**. Seals are made by cutting to size the Asbestos free fiber sheets, which are made as per spec. STF 33-07-02/001E D.
5. **Dimensional tolerances**. Inner diameter: 0 /+ 0.5mm
Outer diameter: 0 /- 0.5mm
Thick: 0 /+ 0.2mm
6. **Test to Guarantee the product life expectancy**. Requirements in STF 33-07-02/001E § 8 relating to sheets are applicable to cut joints i e
 - Identification of the chemical composition of each component.
 - Determination of their respective mass fraction.Following these tests, comparisons shall be performed with the gasket results recorded during qualification tests.
7. **Document to be supplied during delivery** .Type 3.1 acceptance certificate as per NF EN 10204 edition 01/2005.
8. **Packing and Labeling**. Items are to be sealed inside an opaque packaging material to protect against UV rays in flat lying condition on a rigid structure.

Enclosure-1(C)

STATEMENT OF TECHNICAL REQUIREMENTS FOR FLAT AND GROOVED COPPER SEALING RINGS

HEADINGS		REQUIREMENTS / OBSERVATIONS (Note : The off-standard technical requirements are writ in bold characters)
Materials		
1	Annealed copper flat gaskets	<p>Bars: Cu-DHP copper number CW024A metallurgical condition H035 annealed according to NF EN 12163 edition 06/1998.</p> <p>Plates : Cu-DHP copper number CW024A metallurgical condition H040 annealed according to NF EN 1652 edition 03/1998.</p> <p><i>Recall : maximum hardness 50 HB or 50 HV according to NF R 93-920 edition 12/1993.</i></p>
2	Copper grooved gaskets	<p>Bars : Cu-DHP copper number CW024A metallurgical condition H035 according to NF EN 12163 edition 06/1998.</p> <p>Plates: Cu-DHP copper number CW024A metallurgical condition H040 according to NF EN 1652 edition 03/1998.</p>
3	Machining	<p>From bars (machining) or plates (cutting).</p> <p>On annealed copper gaskets, the hardness must be homogeneous over the finished parts and notably on the cutting zones.</p> <p>Surface condition : Ra 6,3.</p> <p>Tolerances : see appendices 1 to 3.</p>

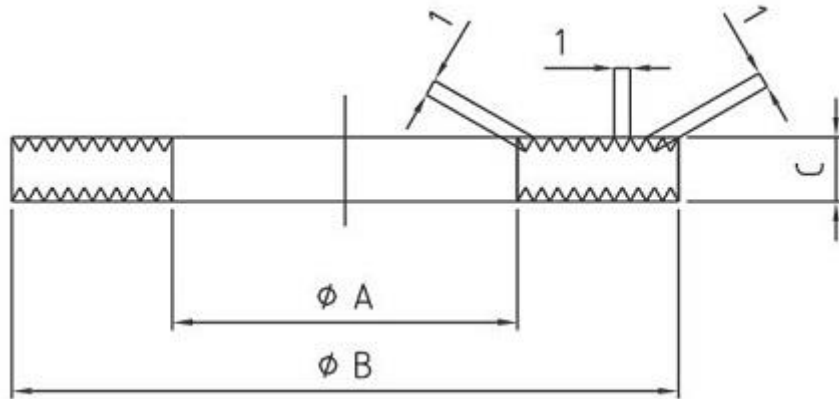
APPENDICES 1 (1/3) NON-STANDARD ANNEALED COPPER FLAT GASKETS FOR METRIC THREADS



OD	Preferential thread <i>In italics</i> thread <i>fine secondary</i>	DSN	Reference	$\begin{matrix} + \\ 0,3 \\ \mathbf{d1} \\ 0 \end{matrix}$	$\begin{matrix} 0 \\ \mathbf{d2} \\ - \\ 0,3 \end{matrix}$	$\begin{matrix} \mathbf{h} \pm \\ 0,1 \end{matrix}$
8	<i>M10 x 1</i>	5330 14 281 6189	Annealed copper flat gasket 10,2 x 13,5 x 1,5	10,2	13,5	1,5
	M12 x 1,25 <i>M12 x 1</i>	5330 14 224 8941	Annealed copper flat gasket 12,2 x 17 x 1,5	12,2	17	1,5

10	M10 x 1	5330 14 281 6189	Annealed copper flat gasket 10,2 x 13,5 x 1,5	10,2	13,5	1,5
	M14 x 1,5 M14 x 1,25	5330 14 266 0476	Annealed copper flat gasket 14,2 x 18,5 x 1,5	14,2	18,5	1,5
	M18 x 1,5	5330 14 252 7295	Annealed copper flat gasket 18,2 x 23 x 1,5	18,2	23	1,5
	M20 x 1,5	5330 14 274 7953	Annealed copper flat gasket 20,2 x 25 x 1,5	20,2	25	1,5
14	M18 x 1,5	5330 14 252 7295	Annealed copper flat gasket 18,2 x 23 x 1,5	18,2	23	1,5
	M20 x 1,5	5330 14 274 7953	Annealed copper flat gasket 20,2 x 25 x 1,5	20,2	25	1,5
	M24 x 1,5	5330 14 266 0475	Annealed copper flat gasket 24,2 x 29 x 1,5	24,2	29	1,5
20	M24 x 1,5	5330 14 266 0475	Annealed copper flat gasket 24,2 x 29 x 1,5	24,2	29	1,5
	M27 x 1,5	5330 14 218 1300	Annealed copper flat gasket 27,2 x 32 x 1,5	27,2	32	1,5
25	M30 x 1,5 M30 x 2	5330 14 278 1757	Annealed copper flat gasket 30,2 x 35 x 1,5	30,2	35	1,5
	M33 x 2	5330 14 274 7956	Annealed copper flat gasket 33,2 x 38,8 x 1,5	33,2	38,8	1,5
30	M33 x 1,5 M33 x 2	5330 14 274 7956	Annealed copper flat gasket 33,2 x 38,8 x 1,5	33,2	38,8	1,5
36	M33 x 2	5330 14 274 7956	Annealed copper flat gasket 33,2 x 38,8 x 1,5	33,2	38,8	1,5

**APPENDIX 3
COPPER GROOVED GASKETS**



ND	DSN	Reference	d1 ± 0,2	d2 ± 0,2	h	± 0,2
10 /14	5330 14 222 9498	Copper grooved gasket 22,5 x 34 x 3	22,5	34	3	
20	5330 14 222 9499	Copper grooved gasket 27,5 x 39 x 3	27,5	39	3	
25	5330 14 222 9500	Copper grooved gasket 33,5 x 45 x 3	33,5	45	3	
30	5330 14 222 9501	Copper grooved gasket 39,5 x 51 x 3	39,5	51	3	
	5330 14 222 9506	Copper grooved gasket 42,5 x 54 x 3	42,5	54	3	
36	5330 14 222 9502	Copper grooved gasket 45,5 x 57 x 3	45,5	57	3	
	5330 14 222 9507	Copper grooved gasket 48,5 x 60 x 3	48,5	60	3	
41,5	5330 14 222 9503	Copper grooved gasket 52,5 x 64 x 3	52,5	64	3	
	5330 14 222 9508	Copper grooved gasket 56,5 x 68 x 3	56,5	68	3	
48	5330 14 306 7350	Copper grooved gasket 60,5 x 73 x 3	60,5	73	3	
	5330 14 313 4453	Copper grooved gasket 64,5 x 76 x 3	64,5	76	3	
57	5330 14 306 7351	Copper grooved gasket 70,5 x 83 x 3	70,5	83	3	
	5330 14 306 7352	Copper grooved gasket 76,5 x 86 x 3	76,5	86	3	