



**MINISTRY OF DEFENCE (DGQA)**


**STANDARD QUALITY ASSURANCE PLAN**  
**SHOCK AND VIBRATION MOUNT**

STANDARD QAP NO. DGQA/DQA(WP)/SHOCK & VIBRATION MOUNT/08/2022/REV 01  
21 JUL 2022

Total Nos. of Pages: 18


**ISSUING AUTHORITY**

DIRECTORATE OF QUALITY ASSURANCE (WARSHIP PROJECT)  
MINISTRY OF DEFENCE (DGQA)  
6<sup>TH</sup> FLOOR, 'B' BLOCK, DEFENCE OFFICES COMPLEX  
SAROJINI NAGAR PO, NEW DELHI – 110 023

	MINISTRY OF DEFENCE / DGQA	SHOCK AND VIBRATION MOUNT	PAGE	02
	DIRECTORATE OF QUALITY ASSURANCE (WP)	STANDARD QAP NO. DGQA/DQA(WP)/SHOCK & VIBRATION MOUNT/08/2022/REV 01	REV. NO.	01
	NEW DELHI – 110 023		DATE	21 JUL 22

### **RECORD OF AMENDMENTS**


<b><u>Sl. No.</u></b>	<b><u>Date of Amendment</u></b>	<b><u>Amendments</u></b>	<b><u>Authority</u></b>	<b><u>Remarks</u></b>

	MINISTRY OF DEFENCE / DGQA	SHOCK AND VIBRATION MOUNT	PAGE	03
	DIRECTORATE OF QUALITY ASSURANCE (WP)	STANDARD QAP NO. DGQA/DQA(WP)/SHOCK & VIBRATION MOUNT/08/2022/REV 01	REV. NO.	01
	NEW DELHI – 110 023		DATE	21 JUL 22

## **MINISTRY OF DEFENCE (DGQA)**


### **STANDARD QUALITY ASSURANCE PLAN** **SHOCK AND VIBRATION MOUNT**

**STANDARD QAP NO.**  
**DGQA/DQA(WP)/SHOCK & VIBRATION**  
**MOUNT/08/2022/REV 01 21 JUL 2022**

  
(S N Alamanda)  
Rear Admiral  
ADGQA(WP)

Promulgated by:-


**DIRECTORATE OF QUALITY ASSURANCE (WARSHIP PROJECT)**  
**MINISTRY OF DEFENCE (DGQA)**  
**6<sup>TH</sup> FLOOR, 'B' BLOCK, DEFENCE OFFICES COMPLEX**  
**SAROJINI NAGAR PO, NEW DELHI – 110 023**

	MINISTRY OF DEFENCE / DGQA	SHOCK AND VIBRATION MOUNT	PAGE	04
	DIRECTORATE OF QUALITY ASSURANCE (WP)	STANDARD QAP NO. DGQA/DQA(WP)/ SHOCK & VIBRATION MOUNT/08/2022/	REV. NO.	01
	NEW DELHI – 110 023	REV 01	DATE	21 JUL 22

## **CONDITION OF RELEASE**

1. This Standard Quality Assurance Plan (SQAP) has been formulated for reference of the Order Placement Agencies, Inspection Authority, Inspection Agencies and the Industry. No alteration is to be made to this SQAP except by the issue of authorised amendment by DQA (WP).
2. It is to be applied, as required, for Quality Assurance during various stages of manufacture of Shock and Vibration Mounts for *IN* Ships.
3. The website **<http://www.dggadefence.gov.in> / [indainnavy.gov.in](http://indainnavy.gov.in) / Naval QA** may also be referred for other Quality Assurance related inputs.
4. The SQAP has been prepared on the basis of decisions made during the collegiate meeting held at DQA (WP) with leading manufacturers of Shock and Vibration Mounts and representatives of Professional Directorates and Production Directorates of the *IN*. Any user of this Standard QAP within DGQA/ *IN* or in industry may propose an amendment to it with valid justification. Proposals not applicable to particular contract can be sent directly to DQA (WP), New Delhi, and those directly applicable to a particular contract are to be dealt with using contract procedures.
5. The specifications and standards laid out in the SQAP are indicative only. The specifications/ parameters and standards given in the Statement of Technical Requirement (SOTR)/ Technical Specifications (TSP)/ MoM of TNC / Approved drawings will be final and binding.
6. DQA (WP) reserves the right to amend or modify the contents of this SQAP without consulting or informing any holder of this document.
7. In case the SQAP is incorporated into contracts, users are responsible for the correct application while complying with contractual and other statutory requirements. Compliance with SQAP does not confer immunity from legal obligations.
8. Enquiries in connection to these requirements may be made from:

**Directorate of Quality Assurance (Warship Project)**  
**Ministry of Defence**  
**6<sup>th</sup> Floor, 'B' Block,**  
**Defence Offices Complex**  
**Sarojini Nagar P.O**  
**New Delhi – 110 023**


	MINISTRY OF DEFENCE / DGQA	SHOCK AND VIBRATION MOUNT	PAGE	05
	DIRECTORATE OF QUALITY ASSURANCE (WP)	STANDARD QAP NO. DGQA/DQA(WP)/SHOCK & VIBRATION MOUNT/08/2022/REV 01	REV. NO.	01
	NEW DELHI – 110 023		DATE	21 JUL 22

### **TABLE OF CONTENTS**

<b>Sl. No.</b>	<b>Description</b>	<b>Page</b>
1.	List of Annexures	05
2.	Standards Invoked	06
3.	Specific Requirements	07-08
4.	Abbreviations	09
5.	Scope	10
6.	Item Description	11
7.	Part-I: General Information	12
8.	Part-II: Technical Inspection/Trials	12
9.	Appendix “A” - Standard QAP for Shock and Vibration Mounts	13-18

### **LIST OF ANNEXURES**


<b>Sl. No.</b>	<b><u>Annexure No.</u></b>	<b><u>Topic</u></b>
1.	Annexure – I	Navy Order 10/2021 Guidelines for Selection, Testing, Storage and Maintenance of Shock and Vibration Mounts
2.	Annexure – II	DQA(WP) policy letter 12575/POLICY/DGQA/WP-TC dated 28 Sep 20 regarding Guidelines for approval of SQAPs/QAPs.
3.	Annexure – III	DQA(WP) policy letter 12575/POLICY/DGQA/WP-TC dated 14 Jun 21 regarding use of approved QAP for replenishment order.
4.	Annexure- IV	DQA(WP) policy no. 29814/MISC/DGQA/WP-TC dated 24 Feb 21 regarding SOP for remote inspection for weight measurement, packing & preservation and painting
5.	Annexure – V	DQA(N) Policy No. 66301/Policy/DQA(N)/SG dated 14 Nov 17 regarding inspection of imported items

	MINISTRY OF DEFENCE / DGQA	SHOCK AND VIBRATION MOUNT	PAGE	06
	DIRECTORATE OF QUALITY ASSURANCE (WP)	STANDARD QAP NO. DGQA/DQA(WP)/ SHOCK & VIBRATION MOUNT/08/2022/	REV. NO.	01
	NEW DELHI – 110 023	REV 01	DATE	21 JUL 22

### **STANDARDS INVOKED**


<b><u>S. No.</u></b>	<b><u>Specification No.</u></b>	<b><u>Description</u></b>
1	IS 1852-1996	Rolling and Cutting Tolerances for Hot Rolled Steel Product
2	IS 2062	Hot rolled medium and high Tensile structural steel
3	IS-3400-14, Method-B Part 14	Bond Strength Test Adhesion of Rubber to Metal
4	BS 970	Specifies requirements for carbon and carbon manganese, alloy, free-cutting and stainless steels normally supplied in the bright cold finished condition.
5	BS 1154	Specification for natural rubber compounds
6	BS 2751	Specification for general purpose acrylonitrile butadiene rubber compound
7	BS-3734-1983	Rubber Moulding Dimension Tolerances
8	BR 3021	Requirement for high impact shock test, Shipboard equipment and systems
9	DGS 8969 A	Requirements for rubber for machinery mounts
10	NO 10/2021	Inspection Schedule for Shock & Vibration Mounting (Navy Order)
11	ISO 2230:2002	Rubber Products- Guidelines for Storage
12	ISO 217-1	Mechanical Vibration and Shock Resilient mounting system
13	ISO 10846-1 ISO 10846-2 ISO 10846-3	Acoustics and Vibration- Laboratory Measurement of Vibro-Acoustic Transfer Properties of Resilient Elements
14	STI-MM-305	Vibration and shock testing for on-board equipment
15	STANAG 4142	Shock resistance analysis of equipment for surface ship
16	STANAG 4549	Testing of surface ship equipment on shock testing machines
17	MIL-STD-167	Marine equipment vibrations
18	MIL-S-901D	Shock for on-board ship
19	GAM-EG-13C	Vibration and shock on-board ship
20	DIN 95365	Marine Mounts geometry and characteristics
21	BV 043	Shock for surface ships and submarines
22	BR 8470	Shock for on-board equipment

*Note: - The Standards given are indicative only. The specifications / standards and parameters given in the SOTR / Technical Specification (TSP) / MoM of TNC / Approved drawings will be final and binding.*

	MINISTRY OF DEFENCE / DGQA	SHOCK AND VIBRATION MOUNT	PAGE	07
	DIRECTORATE OF QUALITY ASSURANCE (WP)	STANDARD QAP NO. DGQA/DQA(WP)/ SHOCK & VIBRATION MOUNT/08/2022/ REV 01	REV. NO.	01
	NEW DELHI – 110 023		DATE	21 JUL 22

### **SPECIFIC REQUIREMENTS**

1. Testing of Mechanical, physical, chemical properties and other tests (wherever specified) has to be done by NABL accredited lab (including firm's NABL accredited lab).
2. Make of item should be as per approved PIL / Detailed Bill of Material (DBOM) or **IN** approved source.
3. The Type Tests are preferably undertaken in Naval testing facilities at NSTL, Vizag or any other facilities within **IN**. In case such facility is not available with NSTL/**IN**, the same can be carried out in a NABL accredited lab under intimation to IHQ MoD(N)/DME and QAE/DQA(WP). Only in exceptional cases where the tests are not available in any of the NABL accredited facility within India, such tests are to be witnessed by QA reps wherever tests are conducted.
4. If Type Test have already been done in earlier projects on identical units, same need not be done again & the reports of earlier tested units will have to be provided for review of inspection agency.
5. If any test under Type Test (as per SQAP sl. No. 5.1.0.0) has not been included/undertaken in the earlier type test/type test report, the same is to be undertaken separately. For any waiver related to any particular type test, IHQ MoD(N) approval needs to be obtained.
6. Post promulgation of this SQAP, separate QAP approval for Shock and Vibration Mounts is not required. The manufacturer shall be required to submit confirmation to concerned QA Agency and OPA towards acceptance of SQAP either in totality or with some design specific inclusions and/or exclusions, if any, along with the following details: -
  - (a) Equipment name.
  - (b) Equipment technical details (as applicable).
  - (c) Purchase Order reference.
  - (d) Sub/Sub-Sub Orders reference (as applicable).
  - (e) Name of Main Indenter/ Ordering Authority.
  - (f) Name of end user, if available.
  - (g) Name of firm / manufacturer.
  - (h) SOTRs reference, if available.
  - (j) Yard No./ Name of ship where to be fitted (if available)/ End user.
  - (k) References of relevant drawings.
  - (l) QAP No. & Date (as indicated by the firm).
  - (m) Contractual delivery date.
  - (n) Inspection Authority.
  - (p) Inspection Agency.
  - (q) Quantity (as applicable).
  - (r) Inclusions, if any.
  - (s) Exclusions, if any.

	MINISTRY OF DEFENCE / DGQA	SHOCK AND VIBRATION MOUNT	PAGE	08
	DIRECTORATE OF QUALITY ASSURANCE (WP)	STANDARD QAP NO. DGQA/DQA(WP)/SHOCK & VIBRATION MOUNT/08/2022/REV 01	REV. NO.	01
	NEW DELHI – 110 023		DATE	21 JUL 22

7. The SQAP along with the proposed inclusions/exclusions to be forwarded to DQA(WP) through inspection agency with recommendation for approval. The inclusion/exclusion to SQAP, approved by DQA(WP) shall be deemed as the approved QAP for the particular PO.

8. Guidelines for approval of SQAPs/QAPs, DQA(WP) policy letter 12575/POLICY/DGQA/WP-TC dated 28 Sep 20 (Annexure-II) is relevant.


9. For replenishment order, DQA(WP) policy letter 12575/POLICY/DGQA/WP-TC dated 14 Jun 21 (Annexure- II) is relevant.

10. Remote Inspection for weight measurement, packing & preservation and painting to be carried out in accordance with DQA(WP) policy no. 29814/MISC/DGQA/WP-TC dated 24 Feb 21 (Annexure-IV).

11. Imported items will be inspected i.a.w DQA(N) Policy No. 66301/Policy/DQA(N)/SG dated 14 Nov 17 (Annexure-V), as amended from time to time. Normally, following documents are inspected: -


- (a) Bill of Lading / Shipping Bill / Airway bill.
- (b) Invoice by OEM or Country of Origin Certificate with Packing List
- (c) Bill of entry to warehousing
- (d) OEM confirmation Certificate
- (e) Firm's Guarantee Certificate as per supply orders (SOs)



	MINISTRY OF DEFENCE / DGQA	SHOCK AND VIBRATION MOUNT	PAGE	09
	DIRECTORATE OF QUALITY ASSURANCE (WP)	STANDARD QAP NO. DGQA/DQA(WP)/SHOCK & VIBRATION MOUNT/08/2022/REV 01	REV. NO.	01
	NEW DELHI – 110 023		DATE	21 JUL 22


### **ABBREVIATIONS**

ASTM	American Society for Testing and Materials
BS	British Standards
CHP	Customer Hold Point
CoC	Certificate of Conformance
COTS	Commercial-off-the-shelf
DBOM	Detailed Bill of Material
DGQA	Directorate General of Quality Assurance
DME	Directorate of Marine Engineering
DQA (WP)	Directorate of Quality Assurance (Warship Project)
DI	Dimensional Inspection
GA	General Arrangement
IHQ	Integral Head Quarters
IN	Indian Navy
IR	Inspection Report (by firm)
IS	Indian Standard
ISO	International Organisation for Standardization
I-Note	Inspection Note
I & T	Inspection and Test
LTC	Lab Test Certificate from NABL approved lab
MoD (N)	Ministry of Defence (Navy)
MoM	Minutes of Meeting
MTC	Manufacture Test Certificate
NABL	National Accreditation Board for Testing and Calibration Laboratories
NSTL	Naval Science and Technology Laboratory
OEM	Original Equipment Manufacturer
OPA	Order Placing Authority
P	Performed by
PIL	Parts Identification List
PO	Purchase Order
QA	Quality Assurance
QAE	Quality Assurance Establishment
QAO	Quality Assurance Officer
QAP	Quality Assurance Plan
R	Review
REV	Revision
SOTR	Statement of Technical Requirement
SQAP	Standard Quality Assurance Plan
STC	Supplier Test Certificate
TC	Test Certificate
TEC	Technical Evaluation Committee
TNC	Technical Negotiation Committee
TSP	Technical Specifications
TT	Type Test
UTM	Universal Testing Machine
VI	Visual Inspection
W	Witness (by QA Rep.)

	MINISTRY OF DEFENCE / DGQA	SHOCK AND VIBRATION MOUNT	PAGE	10
	DIRECTORATE OF QUALITY ASSURANCE (WP)	STANDARD QAP NO. DGQA/DQA(WP)/SHOCK & VIBRATION MOUNT/08/2022/REV 01	REV. NO.	01
	NEW DELHI – 110 023		DATE	21 JUL 22

## **SCOPE**

1. **Scope of Quality Assurance.** The scope of Quality Assurance includes witness/ review at all stages of manufacturing viz. 'Raw Material Stage', 'In-process Stage' and 'Final Stage'. The scope also covers the review and witness of Type test of equipment, wherever applicable.
  
2. The SQAP contains comprehensive list of inspections and/or trials that is to be applicable for Quality Assurance of the equipment. In addition, Quality Assurance of equipment will also be governed by specific conditions laid down in SOTRs and 'Approved Drawings'. The inspections/ trials must be contemporary to latest technology/ techniques available in the industry at the time of placement of order.
  
3. The following quality assurance activities will be carried out during the Quality Assurance of Equipment: -
  - (a) Visual Inspection.
  - (b) Dimensional Inspection.
  - (c) Review of Lab Test Certificates/Supplier Test Certificates/Certificate of Compliance/Calibration Certificate/Import documents.
  - (d) Witness of in-house Lab Testing, if applicable.
  - (e) Review of Type Test Report
  - (f) Review of Draft documentation and witness/Stamping of final documentation, as applicable.
  - (j) Issue of CHP clearance.
  - (k) Issue of Dispatch Clearance or Issue of Form-IV, as applicable.

	MINISTRY OF DEFENCE / DGQA DIRECTORATE OF QUALITY ASSURANCE (WP) NEW DELHI – 110 023	SHOCK AND VIBRATION MOUNT STANDARD QAP NO. DGQA/DQA(WP)/ SHOCK & VIBRATION MOUNT/08/2022/ REV 01	PAGE	11
			REV. NO.	01
			DATE	21 JUL 22

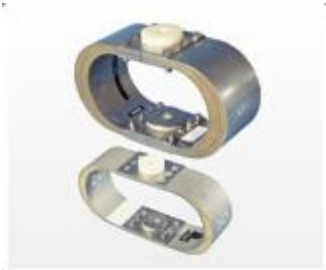
### **ITEM DESCRIPTION**

In simple term, a shock mount is a mechanical fastener that connects two parts elastically. The main part of the shock Mount is the elastic frame on the exterior. This helps to absorb the shock or reduce transmission of vibration from vibration source or exerted by the machine/equipment being aligned/attached to structures/frame or system. It also helps to protect sensitive equipment from motion of the supporting structures.

Shock Mount are meant for working onboard ship/submarines in the presence of water, oil, diesel vapors and also possible contact with oil, diesel, fresh and sea water in temperature range of -5 deg C to +70 deg C and from -10 deg C to +100 deg C for a short duration (not more than 1 hour and not more than once a month).

The following types of Shock Mount are mainly used in Indian Navy:-

**X-Type Mount-** These Mounts are designed and developed to protect ship-borne equipment from vibrations and shock caused by underwater explosion. The Mount generally gives better shock and vibration protection.



**Y-Type Mount-** Very similar protection to the 'X' mount, but with much improved vibration attenuation at higher frequencies.




**L & M Type-** Used for medium to high speed machinery for shock and vibration protection. It is captive when assembled with the decelerating unit.



**AKCC Type-** Shock Absorbers can be used for shock absorption of mechanisms, apparatus units, etc. Type AKCC Shock Absorbers are available in style M (low deflection) and style I (high deflection).



	MINISTRY OF DEFENCE / DGQA	SHOCK AND VIBRATION MOUNT	PAGE	12
	DIRECTORATE OF QUALITY ASSURANCE (WP)	STANDARD QAP NO. DGQA/DQA(WP)/SHOCK & VIBRATION MOUNT/08/2022/REV 01	REV. NO.	01
	NEW DELHI – 110 023		DATE	21 JUL 22

## **STANDARD QUALITY ASSURANCE PLAN**


### **Part – I:      General Information**

The following generic information must generally be indicated on each QAP as its identity: -

- (a) Equipment Name
- (b) Equipment Technical Details (as applicable)
- (c) Purchase Order Reference
- (d) Sub/Sub-Sub Orders reference (as applicable)
- (e) Name of Main Indenter/ Ordering Authority
- (f) Name of end user
- (g) Name of Firm / Manufacturer
- (h) SOTR Reference
- (j) Yard No./ Name of Ship where to be fitted (if available)/End User
- (k) References of relevant Drawings
- (l) QAP No. & Date (as indicated by the firm)
- (m) Contractual Delivery Date
- (n) Inspection Authority
- (p) Inspection Agency
- (q) Quantity (as per PO)

### **Part – II:      Technical Inspection/Trials**

Standard QAP of Shock and Vibration Mount	Appendix “A”
---	--------------

	MINISTRY OF DEFENCE / DGQA	SHOCK AND VIBRATION MOUNTS	PAGE	13
	DIRECTORATE OF QUALITY ASSURANCE (WP)	STANDARD QAP NO. DGQA/DQA(WP)/ SHOCK&VIBRATION MOUNT/08/2022/REV 01	REV. NO.	01
	NEW DELHI – 110 023	<b>Appendix-A</b> <b>(Technical Inspection/Trials in form of SQAP Part-II (Refers to Page No. 12))</b>	DATE	21 JUL 22

### **Standard QAP for Shock and Vibration Mounts**

Sl. No	MATERIALS / COMPONENTS / TEST	CHARACTERISTICS / TYPE OF CHECK	QUANTUM OF CHECK	REF DOCUMENT	ACCEPTANCE CRITERIA	FORMAT OF RECORD	ACTION BY QAE	REMARKS
<b>1.0.0.0</b>	<b>DRAWINGS/DOCUMENTS/TYPE TEST</b>							
1.1.0.0	GA Drawings along with DBOM & Binding Data	Check for availability and verify approved drawings and DBOM & Binding data	100%	Purchase Order & SOTR/TNC Minutes	All approved drawings along with DBOM & Binding data are available.	List of Approved Binding Drawings	CHP for R	Drawing to be approved per purchase order
1.2.0.0	Type Test Reports	Availability & Verification of Type Test / Qualification test reports.	100%	Purchase Order, GA drawings & SOTR/TNC Minutes/ Navy Order 10/2021	Equipment should have successfully undergone Type Test (as applicable)	Type Test reports	CHP for R	<p>Type test are to be conducted as per sl.no. 5.1.0.0 of this SQAP if not undertaken earlier or test certificate not held or elastomers change in existing design.</p> <p>For repeat orders with minor change in configuration and no change in elastomers, in addition to static tests, all dynamic tests are to be undertaken as per Navy order 10/2021.</p> <p>Please refer sl. No. 3, 4 &amp; 5 under specific requirements (Page no. 7)</p> <p>Decision of IHQ MoD(N) is final for all tests.</p>

SI. No	MATERIALS / COMPONENTS / TEST	CHARACTERISTICS / TYPE OF CHECK	QUANTUM OF CHECK	REF DOCUMENT	ACCEPTANCE CRITERIA	FORMAT OF RECORD	ACTION BY QAE	REMARKS
<b>2.0.0.0</b>	<b>RAW MATERIAL INSPECTION</b>							
2.1.0.0	Rubber	(a) Material Identification & stamping	100%	SOTR, Approved GA drawing, DBOM and component drawing/ BS 903 / IS 3400 / Navy Order 10/2021 / Applicable standard	Conformity to specifications	IR	W	Samples will be drawn by QA Rep as and when new batch of rubber manufacturing starts
		(b) Chemical Properties (Polymer identification)	One sample/ Lot / Batch		Conformity to specifications	NABL LTC	R	
		(c) Mechanical Properties (i) Hardness (ii) Density (iii) Tensile Strength (iv) % Elongation at break (v) Compression set at 70° C (vi) % Volume change (vii) Resistance to low temperature (viii) Resistance to Heat Ageing (aa) Change in apparent hardness (ab) Change in tensile strength, % of initial value (ac) Change in elongation at break, % of initial value (ix) Ash content	One sample / lot / batch		Conformity to specifications	NABL LTC	R	
2.2.0.0	Metal (Load Bearing Plate & Supporting Plate etc.)	(i) Integral Test sample in casting process	100%	SOTR, Approved GA drawing, DBOM and component drawing/BS 903/Navy Order 10/2021/App. standard	Conformity to specifications	IR	R	If casting without integral test bar, pouring to be witnessed by QA Rep
		(ii) Material Identification & Stamping	100%		Conformity to specifications	IR	W	Samples will be drawn by QA Rep
		(iii) Mechanical tests (tensile strength and elongation) & Chemical Analysis (As applicable)	One sample/ Lot		Conformity to specifications	NABL LTC	R	

SI. No	MATERIALS / COMPONENTS / TEST	CHARACTERISTICS / TYPE OF CHECK	QUANTUM OF CHECK	REF DOCUMENT	ACCEPTANCE CRITERIA	FORMAT OF RECORD	ACTION BY QAE	REMARKS
2.3.0.0	Rubber metal Bond Strength	Bond Strength Test	One sample/ batch	Approved GA drawing, DBOM, SOTR Applicable standard	Conformity to specifications	NABL LTC	R	To be evaluated by applying the load in shear on UTM
<b>3.0.0.0 OUT SOURCED COMPONENTS</b>								
<b>3.1.0.0 BOUGHT OUT ITEMS</b>								
3.1.1.0	Fasteners	Product Identification	100%	SOTR, Approved GA drawing, DBOM and component drawings	Conformity to specifications	STC/ CoC*	R	*Certificate to include the specification of item
<b>3.2.0.0 COTS (As applicable)</b>								
<b>4.0.0.0 IN-PROCESS INSPECTION</b>								
4.1.0.0	Moulding of Rubber	(i) Visual Inspection	100%	SOTR, Approved GA drawing, DBOM and component drawings	Conformity to approved drawings & specifications	IR	R	
		(ii) Dimensional inspection	100%			IR	R	
4.2.0.0	Machining of Load Bearing Plate & Supporting Plate etc.	(i) Visual & Dimensional Inspection	100%	SOTR, Approved GA drawing, DBOM and component drawings	Conformity to approved drawings & specifications	IR	R	
		(ii) Metal surface preparation prior to rubber bonding	One sample/ batch			IR	R	
4.3.0.0	Bonding of Shock Mounts (Metal to Rubber Bonding)	(i) Visual Inspection of process	One sample / batch	SOTR, Approved GA drawing, DBOM and component drawings	Conformity to approved drawings & specifications	IR	R	
		(ii) Dimensional inspection	100%			IR	R	

Sl. No	MATERIALS / COMPONENTS / TEST	CHARACTERISTICS / TYPE OF CHECK	QUANTUM OF CHECK	REF DOCUMENT	ACCEPTANCE CRITERIA	FORMAT OF RECORD	ACTION BY QAE	REMARKS
4.4.0.0	Assembly of Shock and Vibration Mount	(i) Visual inspection of process	One sample / batch	SOTR, Approved GA drawing, DBOM and component drawings	Conformity to approved drawings & specifications	IR	R	Conformity to OEM process sheet. Should be free from blisters, tears and peelings.
		(ii) Dimensional inspection	100%			IR	R	
5.0.0.0	PRE-REQUISITE FINAL INSPECTION							
5.1.0.0	TYPE TEST (S. NO. 1.2.0.0 OF SQAP IS RELEVANT)							
5.1.1.0	STATIC TEST (Applicable for Initial development/New Design/Elastomer change in existing design/Repeat order with minor change in configuration and no change in elastomers)							
5.1.1.1	Nominal Deflection Test	As per Navy Order 10/2021 or NSTL test procedure	01 Sample	Navy Order 10/2021	Conformity to Navy Order 10/2021	NABL LTC/ NSTL Report	R	Please refer sl. No. 3, 4 & 5 under specific requirements (Page no. 7)
5.1.1.2	Creep Test	As per Navy Order 10/2021 or NSTL test procedure	01 Sample	Navy Order 10/2021	Conformity to Navy Order 10/2021	NABL LTC/ NSTL Report	R	
5.1.1.3	Permanent Set Test	As per Navy Order 10/2021 or NSTL test procedure	01 Sample	Navy Order 10/2021	Conformity to Navy Order 10/2021	NABL LTC/ NSTL Report	R	
5.1.1.4	Over Load Test	As per Navy Order 10/2021 or NSTL test procedure	01 Sample	Navy Order 10/2021	Conformity to Navy Order 10/2021	NABL LTC/ NSTL Report	R	
5.1.1.5	Shear / Bond Strength Test	As per Navy Order 10/2021 or NSTL test procedure	01 Sample	Navy Order 10/2021	Conformity to Navy Order 10/2021	NABL LTC/ NSTL Report	R	
5.1.1.6	Stiffness Test	As per Navy Order 10/2021 or NSTL test procedure	01 Sample	Navy Order 10/2021	Conformity to Navy Order 10/2021	NABL LTC/ NSTL Report	R	
5.1.2.0	ENVIRONMENTAL TEST (Applicable for Initial development/New Design/Elastomer change in existing design)							
5.1.2.1	Resistance to Diesel Oil	As per Navy Order 10/2021 or NSTL test procedure	01 Sample	Navy Order 10/2021	Conformity to Navy Order 10/2021	NABL LTC/ NSTL Report	R	Please refer sl. No. 3, 4 & 5 under specific requirements (Page no. 7)  Nominal deflection test as per sl. No. 5.1.1.1 should also be carried out after this test for comparison.



SI. No	MATERIALS / COMPONENTS / TEST	CHARACTERISTICS / TYPE OF CHECK	QUANTUM OF CHECK	REF DOCUMENT	ACCEPTANCE CRITERIA	FORMAT OF RECORD	ACTION BY QAE	REMARKS
5.1.2.2	Resistance to Liquid (Sea water, fresh water, lub oil etc.)	As per Navy Order 10/2021 or NSTL test procedure	01 Sample	Navy Order 10/2021/ IS: 3400(Part VI): 2012/ISO 1817:2011	Conformity to Navy Order 10/2021 or applicable standard	NABL LTC/ NSTL Report	R	Please refer sl. No. 3, 4 & 5 under specific requirements (Page no. 7)  List of liquids is to be indicated by firm prior to test
5.1.2.3	Salt Spray Test	As per Navy Order 10/2021 or NSTL test procedure	01 Sample	SOTR, App. GA drawing, DBOM, Navy Order 10/2021/ ASTM B117	Conformity to Navy Order 10/2021 or applicable standard	NABL LTC/ NSTL Report	R	Please refer sl. No. 3, 4 & 5 under specific requirements (Page no. 7)
5.1.3.0	DYNAMIC TEST (Applicable for Initial development/New Design/Elastomer change in existing design/Repeat order with minor change in configuration and no change in elastomers)							
5.1.3.1	Sinusoidal Resonance search test	As per Navy Order 10/2021 or NSTL test procedure	04 sample/ batch	Navy order 10/2021/ BR 3021 Vol-I and II and IN shock policy	Conformity to Navy Order 10/2021/ BR 3021 Vol-I and Vol-II and IN shock policy	NABL LTC/ NSTL Report	R	Please refer sl. No. 3,4 & 5 under specific requirements (Page no. 7)  Tests 5.1.3.1, 5.1.3.2, 5.1.3.3 and 5.1.3.4 are to be undertaken in sequence, in one test facility
5.1.3.2	Sinusoidal transmissibility test							
5.1.3.3	Vibration endurance Test							
5.1.3.4	Shock Test							
6.0.0.0	FINAL INSPECTION							
6.1.0.0	Shock and Vibration Mounts	(i) Visual Inspection	100%	Approved GA drawing, SOTR, DBOM and component drawings / Navy Order 10/2021	Rubber components to be free from blister, cavities & tears, no peeling off rubber.	IR	CHP for W	
		(ii) Dimensional Inspection	100%		Conformity to Approved drawings	IR	CHP for W	
		(iii) Nominal Deflection Test	Firm -100% QAE-20 %		Conformity to approved drawings/Navy Order 10/2021 or Applicable Standard	IR	CHP for W	

SI. No	MATERIALS / COMPONENTS / TEST	CHARACTERISTICS / TYPE OF CHECK	QUANTUM OF CHECK	REF DOCUMENT	ACCEPTANCE CRITERIA	FORMAT OF RECORD	ACTION BY QAE	REMARKS
7.0.0.0	<b>PRE-REQUISITE-ISSUE OF FORM-4 (I &amp; T CERTIFICATE)</b>							
7.1.0.0	Weight	Weight recording	100%	Approved Drawing, SOTR& PO	To be within specified limits	Weight certificate	CHP for W	Witness through remote mode also acceptable
7.2.0.0	Coating	Nicol lacquer for Western Mounts & Wax for Russian Mounts.	100%	Navy Order 10/2021	Confirms to specification / Painting Plan	IR	W	Witness through remote mode also acceptable
7.3.0.0	Preservation, Marking & Packing	Mounts to be individually stamped & packed properly to avoid transit damage.	100%	Navy Order 10/2021/ISO 2230:2002	Confirms to specifications	IR	W	Witness through remote mode also acceptable  Packing Procedure to be approved by QA rep.
7.4.0.0	Documentation	The document should contain the following: (a) Data Sheets & Drawings (b) In service renewal and maintenance document. (c) Firm's internal load deflection reports (d) Rubber and Metal Test report from NABL Labs (e) Storage procedure and shelf life documents (f) Grouping certificates of mounts (g) Type Test reports	100%	PO/SOTR/ Approved drawings/ Navy order 10/2021	Confirms to Navy order 10/2021	Documents	R	
7.5.0.0	Form -4 (I&T Certificate)	Correctness	100%	PO/SOTR	PO/SOTR	Form-4	Issue of Form-4	

**Important Notes: -**

1. Witnessing of inspections can be done in remote mode, where feasible, subject to concurrence / modalities jointly by firm and QAO.
2. Customer Holds Point (CHP): a point beyond which QAO has to authorise. The process / activity will be inspected by QA rep
3. Review of certificate and records by QA rep (R): a point at which review of documentation & records at an agreed time after completion of activity.