

MIL-M-50508A(PA)
28 February 1975
SUPERSEDES
MIL-M-50508 (MU)
7 April 1970

MILITARY SPECIFICATION

MOUNT , RESILIENT (FOR USE IN AMMUNITION SHIPPING CONTAINERS)

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 This specification covers sandwich type elastomeric mountings designated as resilient mounts for use in ammunition shipping containers (see 6.1).

1.2 This specification applies in its entirety for all contractors not listed on QPL for a particular resilient mount. If contractor is listed on, or approved for listing on QPL, the provisions for First Article and Regular Production inspection are the only inspection requirements necessary.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids, or request for proposal, form a part of this specification to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL-A-48078 - Ammunition, Standard Quality Assurance Provisions, General Specification for.

STANDARDS

MILITARY

MIL-STD-105	- Sampling Procedures and Tables for Inspection by Attributes (ABC-STD-105)
MIL-STD-810	- Environmental Test Methods.
MIL-STD-1168	- Lot Numbering of Ammunition.
MIL-STD-1169	- Packaging, Packing and Marking for Shipment of Inert Ammunition Components, General Specification for.

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(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer).

2.2 Other publications. - The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM-D573-Accelerated Aging of Vulcanized Rubber
by the Oven Method, Test for

ASTM-D1149-Accelerated Ozone Cracking of Vulcanized
Rubber, Test for

(Application for copies of the above publications should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19103).

3. REQUIREMENTS

3.1 Qualification (see 4.3 and 6.4). - The mounts furnished under this specification shall be a product which has been tested, and passed the qualification tests specified herein, and has been listed on or approved for listing on the applicable Qualified Products List. In order to retain qualification approval of products, the manufacturer must certify that the product listed on the QPL meets the current specification requirements. Any change in the materials, or manufacturing process shall necessitate requalification.

3.2 Materials. - The materials and parts where specified shall be in accordance with the applicable Resilient Mount drawing.

3.3 Mounts. - The mounts shall comply with all requirements specified on applicable Resilient Mount drawing, and with all requirements specified in Table I. A mount shall be considered defective if after being subjected to the applicable test, there is evidence of bond separation, elastomer deterioration, cracks in the elastomer, broken or distorted metals or any other damage that may impair performance. Cuts, gouges, tears, or punctures which are a result of handling, installation, or removal from test fixtures shall not be considered cause for rejection of First Article or Qualification Test Results. Regular production mounts will be rejected on an individual basis.

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Table I

<u>Test</u>	<u>Show Evidence Of Damage</u>	<u>Test Para</u>
Load deflection	None	4.5.2
Pull	None	4.5.3
Drop	None	4.5.4
Fatigue Drop	None	4.5.5
Vibration	None	4.5.6
Salt Fog	None	4.5.7
Fungus Resistance	None	4.5.8
Ozone Aging	None	4.5.9
Air Heat Aging	None	4.5.10

3.4 Identification. - Each mount shall have the name (or symbol) of the manufacturer, manufacturer's part number, and month and year of manufacture molded into the side of the elastomer section in legible character and the Government part number of identification number and lot number ink stamped with indelible ink next to the molded characters as indicated in the applicable Resilient Mount drawing.

3.5 First Article Inspection. - This specification makes provisions for first article inspection. Requirements for the submission of first article samples by the contractor shall be as specified in the contract.

3.6 Workmanship. - All parts shall be fabricated and finished in a thorough, workmanlike manner. The parts shall be free of burrs, chips, sharp edges, cracks, unblended radii, surface defects, dirt, grease, rust, corrosion products and other foreign matter. The cleaning method shall not be injurious to any part nor shall the parts be contaminated. All required marking shall be neat and sharply defined.

4. QUALITY ASSURANCE PROVISIONS.

4.1 Responsibility for Inspection and Standard Quality Assurance Provisions. - Unless otherwise specified herein or in the contract, the provisions of MIL-A-48078 shall apply and are hereby made a part of this detail specification.

4.1.2 Classification of Inspections. - The following types of inspection shall be conducted on this item:

- a. First Article Inspection (see 4.2)
- b. Qualification Inspection (see 4.3)
- c. Quality Conformance (Regular Production) Inspection (see 4.4).

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4.2 First Article Inspection.

4.2.1 Submission. - The contractor shall submit a first article sample (see 6.2 b) as designated by the Contracting Officer for evaluation in accordance with provisions of 4.2.2. The first article sample shall consist of four (4) mounts which have been produced by the contractor using the same production processes, procedures and equipment as will be used in fulfilling the contract. All materials shall be obtained from the same sources of supply as will be used in regular production.

4.2.2 Inspections to be Performed. - Components will be subjected by the Government to any or all examinations specified in 4.4.2 of this specification, tests specified in Table II and any or all requirements of the applicable Resilient Mount Drawings (RMD).

Table II. First Article Tests (Notes 2 and 4)

<u>Test (Note 1)</u>	<u>Test Paragraph</u>
Pull Test, Ta	4.5.3
Drop Test, Ta, Th, Tl (Note 3)	4.5.4
Transmissibility test, Ta (Note 5)	4.5.6.1
Fatigue Test, Ta (Note 5)	4.5.6.3

Note 1: Order or sequence of tests, optional.

2: Four mounts, (2 pair), shall be prepared as specified in 4.5.1. Each pair shall be subjected to all tests indicated.

3: High Temperature (Th) - The mounts shall be conditioned to the high temperature specified in the applicable Resilient Mount drawing. The mount temperature shall be considered stabilized when 3 consecutive readings at 5 minute intervals are within plus or minus 1 degree of each other. At the end of this period, and while remaining at this temperature, the mounts shall be tested. Upon completion of the specified test, the temperature of the mounts shall be reduced to ambient. Forced cooling, such as directing air on the mount by fan or use of refrigerated air shall not be used. Then the mounts shall be examined for compliance with the applicable requirements.

Low Temperature (Tl) - The conditioning shall be as in high temperature except that the low temperature shall be as specified in the applicable Resilient Mount drawing and no forced warming shall be used.

Ambient Temperature (Ta) - The mounts shall be tested at the room temperature specified in the applicable Resilient Mount drawing.

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4: The mounts selected for First Article Tests shall not be considered part of the production run.

5: Provisions of paragraph 4.5.6 are applicable to this test.

4.2.3 Rejection. - See MIL-A-48078(PA).

4.3 Qualification Inspection.

4.3.1 Submission. The manufacturer shall submit samples of his product to a Government approved facility as designated by the preparing activity for qualification testing (see 6.3). All samples submitted shall have been produced by the manufacturer using the same procedures, process and equipment as will be used in regular production. Samples shall be accompanied by a certificate of compliance.

4.3.2 Qualification Inspections to be Performed. - The qualification inspection shall consist of examinations specified in 4.4.2.1 and tests specified in Table III.

Table III. Qualification Tests

Test	Test Paragraph	No. of Mounts req'd (note 1)	Test Fixture req'd
<u>Static Tests</u>			
Load-Deflection Test Ambient Temperature (Ta) (Note 2)	4.5.2	8	4.5.1.3
Pull Test, Ta	4.5.3	8	4.5.1.3
<u>Dynamic Tests</u>			
Drop Test, Ta High Temp (Th) Low Temp (Tl) (Note 2)	4.5.4	2	4.5.1.1
Fatigue Drop Test, Ta	4.5.5	2	4.5.1.1
Transmissibility Test, Ta (Note 5)	4.5.6.1	2	4.5.1.1
Cycling Test, Ta (Notes 4, 5)	4.5.6.2	2	4.5.1.1

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Table III. Qualification Tests (Cont.)

Test	Test Paragraph	No. of Mounts req'd (note 1)	Test Fixture req'd
Fatigue Test, Ta (Notes 4, 5)	4.5.6.3	2	4.5.1.1
<u>Resistance Tests</u>			
Salt Fog (Note 3)	4.5.7	2	4.5.1.2
Fungus Resistance (Note 3)	4.5.8	2	4.5.1.2
<u>Aging Tests</u>			
Ozone Aging (Note 3)	4.5.9	4	4.5.1.2
Air-Heat Aging	4.5.10	4	4.5.1.2

Note 1: Eight mounts shall comprise the qualification lot and shall be tested as follows:

- a. All mounts shall meet the requirements of 4.4.2.1.
- b. Four mounts shall be subjected to the aging and static tests in the following sequences: Load deflection - 4.5.2; Air-heat aging - 4.5.10; Ozone aging - 4.5.9; Load deflection - 4.5.2; Pull test - 4.5.3. Upon completion of the aging and static tests, two mounts, tested as a pair, shall be subjected to the dynamic drop tests 4.5.4 and 4.5.5 and the other two mounts tested as a pair shall be subjected to the dynamic vibration tests 4.5.6.1, 4.5.6.2 and 4.5.6.3.
- c. Two mounts (one pair) shall be subjected to the load deflection - 4.5.2; salt fog - 4.5.7; load deflection - 4.5.2 and pull test - 4.5.3 in that order.
- d. Two mounts (one pair) shall be subjected to the load deflection 4.5.2; fungus resistance test - 4.5.8; load deflection - 4.5.2 and pull test - 4.5.3 in that order.

Note 2: High Temperature (Th) - The mounts shall be conditioned to the high temperature specified in the applicable Resilient Mount drawing. The mount temperature shall be considered stabilized when 3 consecutive readings at 5 minute intervals are within plus or minus 1 degree of each other. At the end of this period, and while remaining at this temperature, the mounts shall be tested. Upon completion of the specified test, the temperature of the mounts shall be reduced to ambient. Forced cooling, such as directing air on the mount by fan or use of refrigerated air shall not be used. Then the mounts shall be examined for compliance with the applicable requirements.

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Low Temperature (Tl) - The conditioning shall be as in high temperature except that the low temperature shall be as specified in the applicable Resilient Mount drawing and no forced warming shall be used.

Ambient Temperature (Ta) - The mounts shall be tested at the room temperature specified in the applicable Resilient Mount drawing.

Note 3: This test need not be conducted if resilient mount is used in a sealed container. This requirement must be stated on RMD.

Note 4: Random/Shock Vibration Tests per paragraph 4.5.6.4 shall be conducted in lieu of cycling and fatigue tests if exception is stated on RMD.

Note 5: Provisions of paragraph 4.5.6 are applicable to this test.

4.3.3 Rejection. - If any mount fails to meet the inspections specified in paragraph 4.3.2, the qualification lot shall be rejected.

4.3.4 Re-Examination. - Re-examination of a qualified product shall be required by the preparing activity under any of the following conditions:

(1) The manufacturer has modified the product or changed the material or processing sufficiently so that the validity of previous qualification is questionable.

(2) The requirements in the specification have been revised sufficiently to affect the character of the product.

(3) When deemed necessary to determine that the product continues to meet all the specification requirements.

4.4 Quality Conformance (Regular Production) Inspection.

4.4.1 Inspection Lot Formation. - Inspection lots shall comply with the lot formation provisions of MIL-A-48078(PA). Lot numbering as required shall be in accordance with MIL-STD-1168.

4.4.2 Examination. - (see MIL-A-48078(PA) Unless otherwise specified in the classification of defects and test tables, sampling plans for major and minor defects shall be in accordance with MIL-STD-105, Inspection Level II. Equipment necessary for the performance of the inspections listed shall be in accordance with 4.4.4.

CLASSIFICATION OF DEFECTS & TESTS

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PARAGRAPH 4.4.2.1	TITLE Mount, Resilient	SHEET 1 OF 2		DRAWING NUMBER applicable Resilient Mount Drawing NEXT HIGHER ASSEMBLY NA
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH
<u>Critical</u>	None defined.			
<u>Major B</u>				
101.	Location of hole(s) in mounting plate.		0.40%	Gage
102.	Diameter of hole(s) in mounting plate, minimum.		0.40%	Gage
103.	Counterbore(s) in mounting plate, improper.		0.40%	Gage
104.	Pitch diameter of threaded hole(s) maximum (max) and/or stud(s), min.		0.40%	Gage
105.	Minor diameter of threaded hole(s) max and/or stud(s) min.		0.40%	Gage
106.	Depth of threaded hole(s) and/or length of stud(s) min.		0.40%	Gage
107.	Location of threaded hole(s) and/or stud(s).		0.40%	Gage
108.	Check for vertical shear set.		0.40%	Gage
109.	Marking missing, incorrect or illegible.		0.40%	Gage
110.	Rubber containing imperfection (i.e. cut, void, hole, crack etc.), except in counterbore area.		0.65%	Visual
NOTES: Defects are generally applicable to all types of mounts, however, exceptions exist where applicability is not pertinent.				

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CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH 4.4.2.1	TITLE Mount, Resilient (Continued)	SHEET 2 OF 2		DRAWING NUMBER applicable Resilient Mount Drawing NEXT HIGHER ASSEMBLY NA	
		AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD	
<u>Minor</u>					
201.	All mount envelope dimensions (length, width, height and diameter). Bare spot in protective coating except for slight scratches. Evidence of poor workmanship.	0.65%	3.2	Gage	
202.		0.65%	3.2	Visual	
203.		0.65%	3.2	Visual	
NOTES: Defects are generally applicable to all types of mounts, however, exceptions exist where applicability is not pertinent.					

CLASSIFICATION OF DEFECTS & TESTS

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PARAGRAPH	TITLE	SHEET 1 OF 1		DRAWING NUMBER
CATEGORY	EXAMINATION OR TEST	AQL OR 100%	REQUIREMENT PARAGRAPH	NEXT HIGHER ASSEMBLY
				PARAGRAPH REFERENCE / INSPECTION METHOD
4.4.2.2	Container, sealed			NA
<u>Critical</u>	None defined.			
<u>Major</u>	None defined.			
<u>Minor</u>				
201.	Container damaged to the extent that contents are exposed.	0.65%	5.1	Visual
202.	Contents move when shaken.	0.65%	5.1	Visual/Manual
203.	Marking missing, incorrect or illegible.	0.65%	5.2	Visual
NOTES:				

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4.4.2.3 Alternate.--The contractor may submit an alternate plan to the requirements of 4.4.2 and 4.4.2.1 (see 6.5).

4.4.3 Testing.--Quality conformance (Regular Production) inspection shall consist of all examinations specified in 4.4.2 and tests specified as follows:

4.4.3.1 Pull test, Ta (see Note 1) --Major B defect.--This test shall be conducted one hundred (100) percent. Any item which fails to comply with the applicable requirement shall be classed defective and removed from the lot.

4.4.3.2 Drop test, Ta --Major B defect.--From each lot, two (2) mounts shall be selected for every 100 mounts produced. If there is a multiple of less than 100 mounts, two (2) mounts shall be selected from this multiple. Failure of any mount shall be cause for rejection of the lot. Mounts which meet the requirement shall be returned to the lot and counted in production.

Note 1: Ambient temperature (Ta) - The mounts shall be tested at the room temperature specified in the applicable Resilient Mount Drawing.

4.4.4 Inspection Equipment.--The inspection equipment required to perform the inspections and tests prescribed in this specification is identified in the "Paragraph Reference/Inspection Method" column in the tables starting with paragraph 4.4.2.1, and the test method paragraphs (see 4.5). The contractor shall submit for approval, inspection equipment designs in accordance with the terms of the contract. See Section 6 of MIL-A-48078, and section 6.3 herein.

4.5 Test Methods and Procedures (see 6.6)

4.5.1 Test fixture (see 6.7)

4.5.1.1 Dynamic test fixture.--A test fixture shall be prepared consisting of a pair (two) of Resilient Mounts, a suspended mass and an exterior frame work as required to perform the applicable tests. The suspended mass (material optional) shall be equal to the weight that a pair of mounts will support statically, as specified by the applicable Resilient Mount drawing. The suspended mass shall be interposed between the mounts on one of their sides and in turn the other side of the mounts shall be attached to an exterior frame work. The suspended mass and the pair of mounts shall form a center of gravity system along the vertical (shear) and lateral (compression) axis of the resilient mounts. The suspended mass and

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exterior framework shall be of a rigid (rugged) design to withstand the applied dynamic loadings without influencing the response data recorded during the applicable tests.

4.5.1.2 Aging and Resistance Test Fixture. - A single Resilient Mount shall be inserted into a framework which will permit the mount to be deflected in shear to the same static deflection produced by the suspended mass on a pair of mounts as specified in applicable Resilient Mount drawing. The framework shall be of open construction which will permit the circulation of air around mount and shall be sufficiently rigid to maintain the strain on the mount after the external load to produce the strain is removed and resulting deflection is maintained by the fixture.

4.5.1.3 Static test fixture. - The fixture shall be prepared as specified in 4.5.1.1 except that a rigid light weight yoke or bar will be used in lieu of the suspended mass and that the light weight yoke need only form a center of gravity system along the vertical (shear) axis of the resilient mounts.

4.5.2 Load-deflection. - A test fixture shall be prepared as specified in 4.5.1.3. The mounts shall be preflexed twice in shear (from the same initial reference position) to the maximum deflection specified on the applicable Resilient Mount drawing by applying and relieving the required load continuously to the yoke at a rate of 0.5 to 1.0 inches per minutes. Prior to continuation of the test either of the following conditions must be met:

- a. A period of 30 minutes minimum shall elapse; or
- b. The mount "set" shall be within .25 inch of the original reference position of the initial preflex.

A preload (including the weight of the yoke) from 5% to 10% maximum of the static spring rate of a pair of mounts shall be applied to the mounts prior to the third flexing to measure load deflection values. Then the load scale and deflection indicator shall be zeroed at the preload value and deflection position. The required load shall then be applied at a rate of 0.5 to 1.0 inches per minute. Load readings shall be taken at 1.0 inch increments without interruption of the load application and shall agree with the load values specified on the applicable resilient mount drawing.

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4.5.3 Pull test. - A test fixture shall be prepared as specified in 4.5.1.3. The mounts shall be deflected in shear to the amount specified on the applicable Resilient Mount drawing by applying the required load at a rate of 0.5 to 1.0 inches per minute. This test can be performed as a continuation of test 4.5.2. Alternate load rate: The loading may be applied continuously to the yoke at a rate of 20 + 1 inches per minute and held at the maximum deflection specified on the applicable Resilient Mount drawing for a period of 20 seconds prior to checking for evidence of damage.

4.5.4 Drop test. - A test fixture shall be prepared as specified in 4.5.1.1. Suitable instrumentation shall be installed in appropriate positions on the fixture to measure deceleration and deflection of the suspended mass in shear plane. The entire assembly shall be raised to each drop height specified in the applicable Resilient Mount drawing and allowed to fall freely and flat on its base onto a concrete or similarly hard surface. Deceleration and/or deflection, as applicable, shall be measured and recorded. This test shall be performed a minimum of two times at each drop height. The decelerational loads or shock level (in g's) and deflections shall meet the requirements specified on applicable Resilient Mount drawings.

4.5.5 Fatigue drop test. - A test fixture shall be prepared as specified in 4.5.1.1. The test fixture shall be raised to the height specified in the applicable resilient mount drawing and allowed to fall freely on its base against a concrete or similarly hard surface. This test is repeated for a total number of 50 drops or as specified on applicable Resilient Mount drawing.

4.5.6 Vibration tests. - A test fixture shall be prepared as specified in 4.5.1.1. Vibration pick-ups shall be mounted on both the top of the suspended mass directly above the mass center of gravity, and on the vibration input platform. The pick-ups shall be accelerometers capable of accurate measurements in the frequency range of the test. The vibration shaker must be capable of providing the specified inputs over the specified frequency range. The magnification factor and the transmitted deceleration (output G_m) for the vibration tests specified herein shall not exceed the values specified on the applicable Resilient Mount drawing.

4.5.6.1 Transmissibility test. - The direction of input shall be parallel to the vertical shear axis and the sensitive axis of the accelerometer shall be in the direction of the vibratory input. Vibratory requirements shall be in accordance with Table IV. The test shall be conducted at ambient temperature, T_a , unless otherwise specified.

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Table IV. Transmissibility Test

Frequency Intervals of Forcing Function (Hz)	Input	Logarithmic Sweep Rate Octave/Minute + 10%	Bi-Directional Sweep Time (Minutes)	No. of recorded Sweeps Per Frequency Intervals
5.5-22-5.5	.10 DA	1	4	1
22-200-22	2.5 G	5	1.5	1

4.5.6.2 Cycling test. - The test shall be conducted similarly to 4.5.6.1, except that the vibratory requirements shall be in accordance with Table V. The test shall be conducted at ambient temperature, T_a , unless otherwise specified.

Table V Cycling Test

Frequency Intervals of Forcing Function (Hz)	Input	Total Cycling Time (Minutes)	Bi-Directional Sweep Time (Minutes) Note 1	No. of Sweeps per Frequency Interval Note 2
5.5-10-5.5	0.3 DA	13.8	2.3	6
10-17-10	1.5 G	13.2	2.2	6
17-22-17	.10 DA	6.0	1.0	6
22-92-22	2.5 G	33.0	5.5	6
92-110-92	.0058DA	4.2	.7	6
110-200-110	3.5 G	13.8	2.3	6

Note 1: Frequency variation within equal intervals is .8 octave per minute + 10% (logarithmic sweep rate).

Note 2: Record the last sweep (vibration input and output) during each frequency interval.

4.5.6.3 Fatigue Test. - The direction of input shall be parallel to the vertical shear axis of the mounts. The test fixture shall be vibrated at the natural frequency of the isolation system for the time, input amplitude or deceleration specified in Table VI. (The natural frequency of the isolation system is determined from the transmissibility test, 4.5.6.1, and is defined as the frequency at which the transmissibility ratio, output G/input G is the greatest). The test shall be conducted at ambient temperature, T_a , unless otherwise specified.

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Table VI. Fatigue Test

<u>Frequency Internal of Forcing Function (Hz)</u>	<u>Input Note 2, 3</u>	<u>Time</u>
5.5 - 22	.10 DA	30 min
22 - 200	2.5 G	Note 1, 3

Note 1: When resonance occurs in the 5.5 to 22 Hz range, vibrate intermittently at resonance based on 5 minute test period with a 2 minute shut down interval. If a shift in natural frequency occurs, "chase" resonance to assure maximum magnification. Total time at resonance 60 minutes. When resonance occurs above 22 Hz vibrate 60 minutes steady state.

2: If the resonant point occurs at the overlapping frequency (22 Hz), input is optional.

3: In the 5.5 - 22 Hz range record the vibration input and output at the beginning and completion of each dwell period. Above 22 Hz, record the input and output at four equally spaced intervals.

4.5.6.4 Random/Shock Test. - This test shall be conducted in accordance with vibratory requirements specified on Table VII. This test shall be conducted as an alternative to cycling (4.5.6.2) and fatigue (4.5.6.3) tests when specified on Resilient Mount Drawing.

4.5.7 Salt Fog. - A test fixture shall be prepared as specified in 4.5.1.2. The mount(s) shall be subjected to the salt fog test in accordance with MIL-STD-810, Method 509, for a period of 50 hours.

4.5.8 Fungus resistance. - A test fixture shall be prepared as specified in 4.5.1.2. The Mount(s) shall be subjected to the fungus test in accordance with MIL-STD-810, Method 508.

4.5.9 Ozone aging. - A test fixture shall be prepared as specified in 4.5.1.2. The mounts(s), while installed in the fixtures as specified, shall be subjected to the ozone test in accordance with ASTM D1149. The mount(s) shall be subjected to the concentration and operating temperature specified in the ASTM for a period of 7 days.

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TABLE VII. RANDOM/SHOCK TEST

RANDOM VIBRATION AND SINE DELAY SHOCK TESTS

THE RANDOM VIBRATION AND SINE DELAY SHOCK TESTS (NOTE 1) AS PRESENTED IN THIS TABLE WILL BE PERFORMED IN THREE AXIS AND IN THE SEQUENCE LISTED BELOW. THE AXIS SPECIFIED SHALL BE AS DEFINED IN DETAIL A. TESTING IN THE LONGITUDINAL AXIS CAN BE CONDUCTED IN THE VERTICAL AXIS (AT THE LONGITUDINAL AXIS LEVELS) IF FIXTURE LIMITATIONS PRECLUDE TESTING IN THE LONGITUDINAL PLANE, FIXTURE SET UP SHALL BE AS SPECIFIED IN PARAGRAPH 4.5.6, UNLESS OTHERWISE SPECIFIED, THE TESTS SHALL BE CONDUCTED AT $80 \pm 20^\circ \text{ F}$.

A. VERTICAL AXIS (SHEAR) - THREE TEST CYCLES SHALL BE PERFORMED IN THIS AXIS. THE TESTS LISTED BELOW SHALL BE PERFORMED IN THE ORDER LISTED AND WHEN COMPLETED, SHALL BE CONSIDERED ONE TEST CYCLE. TESTS ARE REFERRED TO AS FIG AND INCLUDE THOSE TESTS SPECIFIED BY THAT FIG NUMBER.

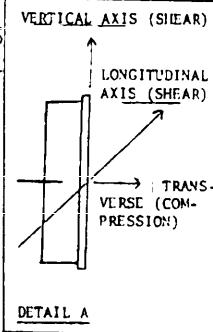
FIG 4, 1, 4, 1, 4, 1, 2, 3, 5

B. LONGITUDINAL AXIS (SHEAR) - ONE TEST CYCLE SHALL BE PERFORMED IN THIS AXIS. TESTS SHALL BE PERFORMED IN THE ORDER INDICATED.

FIG 5, 6, 5, 6, 5, 6, 5

C. TRANSVERSE AXIS (COMPRESSION) - ONE TEST CYCLE SHALL BE PERFORMED IN THIS AXIS. TESTS SHALL BE PERFORMED IN THE ORDER INDICATED.

FIG 5, 7, 5, 7, 5, 7, 5

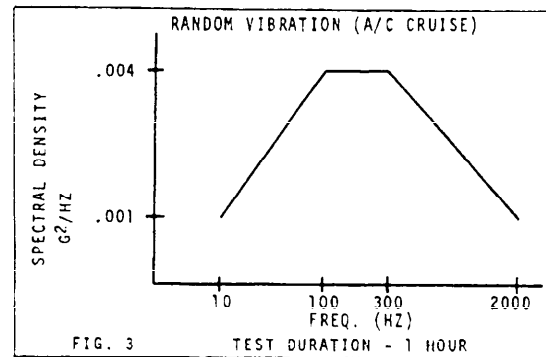
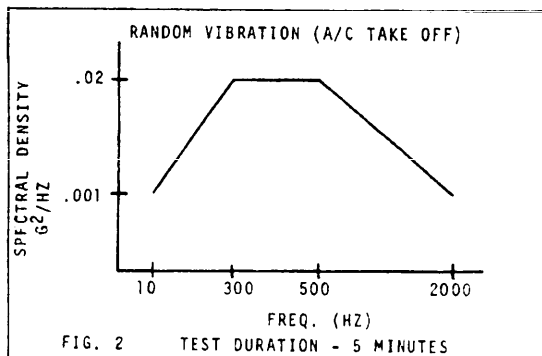
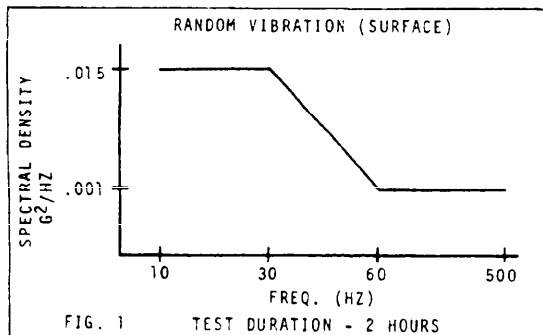


NOTE

1 - THE DECAYING SINE SHOCK TEST IS DEFINED AS A 10% CRITICALLY DAMPED SINE WAVE OSCILLATION WITH A MATHEMATICAL RELATIONSHIP OF $G = e^{-Bt} \sin \pi f t$

WHERE: $B = \%$ CRITICAL DAMPING $= \frac{C}{C_c}$

WHERE: $C =$ DAMPING COEFFICIENT AND $C_c =$ CRITICAL DAMPING COEFFICIENT



SHOCK (10% DECAYING SINE)

NO. OF PULSES	FREQ (Hz)	ACCEL (g)	MINIMUM TIME* (SEC)
13	3	1.0	15
13	5	1.0	15
22	7	1.0	10
22	10	1.0	10
17	15	1.0	10
17	19	1.0	10
20	35	1.0	10
17	80	1.0	10
1	3	3.2**	60
1	5	3.2**	60

*TIME BETWEEN SHOCK PULSES
**TO MAXIMUM MACHINE DISPLACEMENT LIMIT

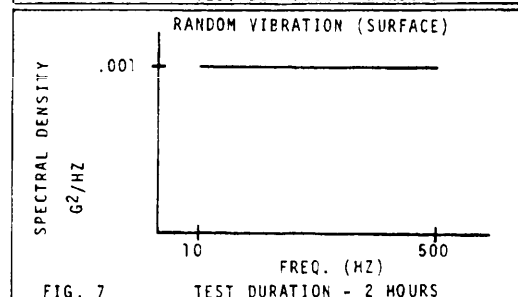
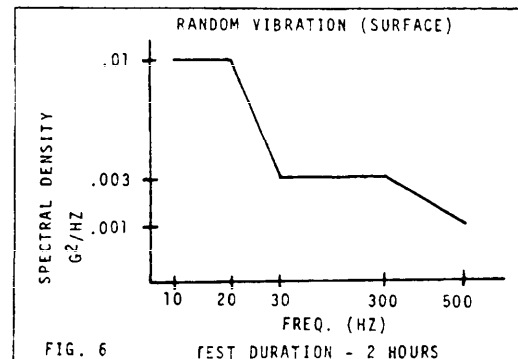
FIG 4

SHOCK (10% DECAYING SINE)

NO. OF PULSES	FREQ (Hz)	ACCEL (g)	MINIMUM TIME* (SEC)
14	3	1.0	15
14	5	1.0	15
24	7	1.0	10
24	10	1.0	10
17	15	1.0	10
17	19	1.0	10
20	35	1.0	10
17	80	1.0	10

*TIME BETWEEN SHOCK PULSES

FIG 5



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4.5.10 Air heat aging. - A test fixture shall be prepared as specified in 4.5.1.2. The mount(s), while installed in the test fixture as specified, shall be subjected to the air-oven test in accordance with ASTM D573. The mount(s) shall be subjected to this test at an operating temperature of 80 plus or minus 1 degree C. for an aging interval of 7 days.

5. PREPARATION FOR DELIVERY

5.1 Packing

5.1.1 Level C. - The resilient mounts shall be packed in accordance with minimum package and packing which will afford adequate protection against corrosion, deterioration, and physical damage during shipment from the supply source of the first receiving activity. Shipping containers shall be snugly packed and constructed so as to insure acceptance by common carrier or air express for safe transportation to the destination point. Containers shall conform to the requirements of the Consolidated Freight Classification rules in effect at the time of shipment, except the fiber-board, when used, shall have a minimum Mullen Test of 275 pounds. Containers shall be able to withstand storage, re-handling, and reshipment without the necessity of repacking.

5.2 Marking. - Marking shall be in accordance with MIL-STD-1169.

6. NOTES

6.1 Intended Use. - The resilient mounts covered by this specification are intended to be used for ammunition shipping containers for fragile munitions such as warhead sections, adaption kits and bomb dispensers.

6.2 Ordering Data. - Procurement documents shall specify the following:

- a. Title, number and date of this specification
- b. Provisions for submission of first article sample.
- c. Provisions of MIL-A-48078.

6.3 Submission of Inspection Equipment Designs for Approval. - See MIL-A-48078. Submit equipment designs, as required, to Commander, Picatinny Arsenal, ATTN: SARPA-QA-T, Dover, New Jersey 07801.

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6.4 Qualification. - With respect to products requiring qualification, awards will be made only for such products as, have prior to the time set for opening of bids, been tested and approved for inclusion in the applicable Qualified Products Lists whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government, tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the Qualification Products List is: Commander, Picatinny Arsenal, Dover, New Jersey, 07801 ATTN: SARPA-QA-A-P, and information pertaining to qualification of products may be obtained from that activity.

6.5 Alternate inspection plan. - This applies solely to the requirements of 4.4.2 and 4.4.2.1. The activity responsible for the approval of this alternate plan is: Commander, Picatinny Arsenal, Dover, New Jersey, 07801 ATTN: SARPA-QA-A-P.

6.6 Prior approval of the Contracting Officer is required for use of equivalent test methods. A description of the proposed method should be submitted through the Contracting Officer to: Commander, Picatinny Arsenal, ATTN: SARPA-QA-A-P, Dover, New Jersey 07801. This description should include but not be limited to the accuracy and precision of the method, test data to demonstrate the accuracy and precision and drawings of any special equipment required.

6.7 Test fixture drawings. - It should be noted that during the development of the resilient mounts, the test fixtures described on Drawing No. 9207832, 9221082, 9215637, 9206835 and 9221039 were also designed. These drawings may be obtained for informational purposes from the Contracting Officer, Picatinny Arsenal, Dover, New Jersey, 07801, if so desired by the contractor.

6.8 Storage of records. - The minimum storage life of storage records shall be four years. These records shall be made available upon the request of the Contracting Officer.

Custodian:
Army - PA

Preparing Activity:
Army - PA

Project Number: 8140-A130

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COMMANDER
Picatinny Arsenal
ATTN: SARPA-QA-A
Dover, New Jersey 07801

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