

INCH-POUND

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SUPERSEDING

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MILITARY STANDARD

DESIGN AND TEST REQUIREMENTS FOR  
LEVEL B AND LEVEL C AMMUNITION PACKAGING



Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army ARDEC, ATTN: SMCAR-BAC-S, Picatinny Arsenal, New Jersey 07806-5000 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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### FOREWORD

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2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to : Commander, U.S. Army Armaments, Munitions and Chemical Command, ATTN: SMCAR-QA, Picatinny Arsenal, NJ 07806-5000 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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### 1. SCOPE

1.1 Scope. This standard establishes minimum Level B and Level C Army packaging, packing and marking requirements using federal or military specifications for protection of munition or munition related components from a manufacturing facility to a CONUS interplant or worldwide receiving activity.

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## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specification and standards. The following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation, form a part of this standard to the extent specified herein.

## SPECIFICATION

## MILITARY

- |            |                                |
|------------|--------------------------------|
| MIL-P-116  | - Preservation, Methods of     |
| MIL-Q-9858 | - Quality Program Requirements |

## STANDARDS

## MILITARY

- |                |   |
|----------------|---|
| MIL-STD-129    | - Marking for Shipment and Storage  |
| MIL-STD-1904   | - Design and Test Requirements for Level A Ammunition Packaging                     |
| MIL-STD-2073-1 | - DoD Material Procedures for Development and Application of Packaging Requirements |
| MIL-STD-45662  | - Calibration System Requirements   |

(Unless otherwise indicated, copies of federal and military specifications, standards and handbooks are available from the Standardization Document Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings and publications. The following other Government documents, drawings and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

- |          |   |
|----------|---|
| AR700-15 | - Packaging of Materiel                 |
| 49CFR    | - Code of Federal Regulations Title 49  |
|          | - Transportation of Hazardous Materials |

(Copies of other Government documents, drawings and publications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

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2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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## 3. DEFINITIONS

3.1 Packaged item. Munitions (e.g. training ammunition, ammunition sub-assemblies, bulk propellants, high explosives, or small explosive components) or munition related components (e.g. metal parts or test sets) that will be protected from physical and functional damage through packaging and packing.

3.2 Unit package. The unit package is the first tie, wrap, or container applied to a single packaged item or a quantity thereof, or to a group of packaged items of a single stock number, preserved or unpreserved, that constitutes a complete or identifiable package. The same applies for a set, kit, assembly, etc., with all its component parts, that constitutes a complete and individually identifiable package.

3.3 Intermediate package. A wrap, box, or bundle that contains two or more unit packages of identical packaged items.

3.4 Pack. An exterior container (e.g. wood box, plastic or metal container, fiberboard box) used to encapsulate the packaged item or unit/intermediate packages containing the packaged item.

3.5 Unitization. Assembly of packs of one or more packaged items into a single load in such a manner that the load can be handled as a unit through the distribution system.

3.6 Level B. This packaging provides intermediate protection to packaged items under generally favorable environmental conditions of worldwide shipment, handling and storage as defined in AR 700-15. For this standard, two Level B packs shall be considered:

3.6.1 Level B maximum. This pack (e.g. training ammunition), unless otherwise specified, shall meet the same environmental testing requirements (with the exception of test temperatures) that a war reserve Level A packaged item would encounter during tactical field transportation and handling.

3.6.2 Level B standard. This pack (e.g. foreign military sales), shall meet environmental testing requirements that a packaged item would encounter during normal shipment generally utilizing commercial vehicles for transportation and a controlled handling environment.

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3.7 Level C CONUS interplant. This packaging provides minimum protection to packaged items under known favorable environmental and handling conditions as defined in AR 700-15. It should be specified for domestic shipment where use of or consumption of the packaged item at the first destination is anticipated within 18 months.



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## 4. GENERAL REQUIREMENTS

4.1 General. Packaging (including preservation), packing, marking, and unitization, if required, shall meet the requirements, as specified, for Level B or Level C packs as defined in this document, AR 700-15 and the appropriate sections of Code of Federal Regulations, Title 49 (49CFR), and Performance Oriented Packaging in accordance with MIL-STD-1904 for hazardous materials and also meet or exceed the following minimum design and test requirements:

4.1.1 Packaging. All packaging materials that come in contact with energetic materials must be compatible with the energetic materials. Container material test requirements in accordance with MIL-STD-1904 shall be met except that high and low temperatures shall be as specified herein for Level B or C pack.

4.1.1.1 Cleaning. If required, cleaning of packaged items prior to packaging shall be accomplished utilizing any MIL-P-116 cleaning method which will provide a clean packaged item with no adverse effects to the packaged item.

4.1.1.2 Drying. If required due to the cleaning method selected, packaged items shall be thoroughly dried to remove cleaning solutions or residual moisture in accordance with MIL-P-116. Drying shall be performed immediately after cleaning.

4.1.1.3 Preservative. Packaged items susceptible to corrosion or deterioration shall be provided protection such as preservative coatings or volatile corrosion inhibitors. Application of the preservative shall be in accordance with MIL-P-116. Any oil removed from a part in the cleaning or drying process must be re-applied in accordance with item engineering drawings.

4.1.1.4 Unit package. Each item shall be encapsulated in a unit package, to include wrapping and cushioning as necessary, in such a manner that it will afford the required protection against physical and environmental damage during shipment, handling, and storage. The unit package shall meet MIL-P-116 requirements for the method utilized and meet the design requirements of MIL-STD-2073-1. Sets, kits, assemblies or packaged items consisting of more than one part shall be individually unit packaged. Components shall be suitably segregated and identified within the unit package. Each set, kit or assembly shall include a list of contents.

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4.1.1.4.1 Unit package quantity. The unit package quantity shall be any suitable quantity that meets the user requirements generally, however and unless otherwise specified, the unit package quantity shall be one. Unit container shall be limited to a net of 60 pounds or a maximum volume of 2.0 cubic feet, whichever occurs first.

4.1.1.5 Intermediate package. An intermediate package shall contain uniform quantities (e.g. 2,5,10,25,50) of packaged items bearing the same stock number, and will be used when the exterior surface of the unit package is a bag of any type, regardless of size or is less than 64 cubic inches. The intermediate package shall meet MIL-P-116 requirements for the method utilized and meet the design requirements of MIL-STD-2073-1.

4.1.1.5.1 Intermediate package quantity. An intermediate container shall normally be limited to a maximum of 100 unit packages, a net load of 120 pounds or a maximum volume of 3.0 cubic feet, whichever comes first.

4.1.2 Packing. A multiple quantity of unit or intermediate packages, bearing the same stock number, shall be placed in a close-fitting container conforming to federal or military specifications. The exterior pack shall meet MIL-P-116 requirements for the method utilized and meet the design requirements of MIL-STD-2073-1. An exterior pack (container) containing packaged items, either a) not exceeding a gross weight of 150 pounds or b) exceeding 150 pounds, shall sustain the applicable environmental tests, specified for Level B Maximum, Level B Standard, or Level C CONUS Interplant, cited in Table I or II of Appendix A. (NOTE: Rough handling tests specified in MIL-P-116 or MIL-STD-2073-1 do not apply.) A unit or intermediate package that meet all common carrier rules, sustain the tests specified in this paragraph and provide safe delivery to the final destination need not be packed into an exterior container, then the unit or intermediate package becomes the exterior pack.

4.1.3 Marking. In addition to any special marking required by the contract or purchasing order, all unit packages, intermediate packages, and exterior shipping containers shall be legibly and durably marked in accordance with MIL-STD-129 and 49CFR, if a hazardous material.

4.1.3.1 Bar code markings. Bar code markings are required and shall be applied in accordance with MIL-STD-129.

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4.1.3.2 Performance Oriented Packaging (POP) marking. POP marking shall meet the requirements of MIL-STD-1904 except that the stencil ink shall be the same as used for the general marking in accordance with 4.1.3. POP marking shall be applied to an exterior pack only when packaged item is identified as a hazardous material.

4.1.4 Unitization. Unitization shall be required when quantities per destination makes unitization cost effective. A quantity of items packed for shipment shall be placed on pallets conforming to federal or military specification in accordance with MIL-STD-2073-1. The load shall be secured to the pallet by any means that will ensure safe delivery to destination and not contribute to the deterioration of the exterior pack or its contents.

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5. DETAILED REQUIREMENTS

Not applicable.

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## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Issue of DoDISS. When this standard is used in acquisition, the applicable issue of the DoDISS must be cited in the solicitation.

6.2 Supplemental testing. The packaging requirements, and tests cited in this standard can be used to insure a satisfactory container (unit of issue). However, there are other tests or requirements necessary per regulation and/or law which are performed both on the individual container and/or the unitized load. These tests, in general, are conducted by Army agencies responsible for particular areas of concern and are coordinated through the item/system engineer. Before a container or unitized load can be considered ready for meeting Level B or C field use, the following tests must be performed:

6.2.1 Unitization. If a container requires unitization, (see 4.1.4) the finalized unitization drawings must be generated or if contractor generated, approved, by the U.S. Army Defense Ammunition Center and School. In addition to drawings, outloading tests are conducted, if necessary, to determine adequate tiedown/blocking and bracing procedures and provisions in various transport modes. For Level B Maximum packs, the unitized load of packaged items issued for training in pallet size quantities shall have top lift capability. (NOTE: Self-unitized containers may not require unitization for shipment, however, they must meet the requirements of this paragraph.)

6.2.2 Hazard classification. In order to determine the hazard class of the packaged item (hazardous materials only), tests per TB700-2 must be conducted or the hazard class may be determined by the Safety Office by analogy using similar packaged items. Hazard class must be assigned prior to shipping any hazardous material.

6.2.3 Safety testing. The Test and Evaluation Command (TECOM) is responsible for performing safety and other tests deemed necessary prior to Level B Maximum packaged items being production released to the field. This independent evaluation could include the same tests as listed in this standard or additional tests as deemed necessary prior to fielding.

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6.3 Subject term (key word) listing.

Container  
Exterior packing  
Intermediate packaging  
Unitization  
Unit packaging

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## Testing for Level B and Level C Packs

10.1 Test planning. Prior to start of tests, a test plan shall be formulated which will detail the number of containers to be tested, tests to be conducted, performance requirements, pre-test data and parameters for determining proper evaluation of the packaged item and package before and after test, applicable configuration of the packaged item and package, and temperature level. Provision should be made for recording (both written and pictorial) the necessary test data to show test performance and test results.

10.2 Test plan. The environmental tests listed in Table I (packs weighing 150 pounds or less) and Table II (packs weighing more than 150 pounds) will aid in developing a test plan. Tests are delineated in MIL-STD-1904 and MIL-STD-810. The final test plan produced is subject to review and approval by the cognizant Government packaging design activity.

10.3 Test quantities.10.3.1 Packs weighing 150 pounds or less. See Table I.

10.3.1.1 Level B maximum. The tests #1, 2, 4, 5 and 7 as cited in Table I shall be performed sequentially on each packaged container. Unless otherwise specified, six (6) loaded containers will constitute a test sample at each of the three temperatures specified in 10.5 for a total requirement of eighteen (18) containers. If the exterior pack (container) has more than six (6) packaged items per container or the total number of packaged items (inert and live) required to load eighteen (18) containers are not available or too costly, then the total quantity of containers can be reduced to six (6). In this case the tests are the same as those specified in Table I, except that the six orientations of the seven foot drops shall be reduced to two orientations, each different, per temperature. This will provide for a total of six different, orientations of the seven foot drops over three temperatures. NOTE: Performance Oriented Packaging (POP) Tests for hazardous materials at four feet need not be conducted if sufficient tests are conducted at seven feet to meet the POP requirements. However, if the POP requirements are not satisfied by the seven foot drop, a single four foot drop must be conducted on virgin containers for any drop orientation that failed or was not conducted. The loose cargo vibration,

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test No. 5, conducted as part of the vibration/handling tests partially satisfies the loose cargo vibration requirement for POP. To fully satisfy this requirement, an additional 30 minutes at a temperature of 72 degrees F with inputs as specified in 49CFR shall be conducted at the conclusion of all vibration handling tests. After the above stated tests are conducted on 18 or 6 containers, as applicable, an additional six loaded untested containers are required to perform tests #8 (forty foot drop) for hazardous materials only.

10.3.1.2 Level B standard. The tests #1, 2, 4, 5 and 6 as cited in Table I shall be performed sequentially on each packaged container. Two (2) loaded containers will constitute a test sample at each of the three temperatures specified in 10.5 for a total of six (6) containers. The four foot drops, test No. 6, meet the requirements for Performance Oriented Packaging (POP) for hazardous material and shall be performed as specified in Table I except that the six orientations of the four foot drops shall be conducted at a temperature of 72 degree F. (NOTE: For circular containers, (e.g. drums) the six (6) containers for the four foot drop, test No. 6, shall be dropped as follows: 3 containers, dropped on the weakest part, such as on a chime, or if no chime, on a circumferential seam on an edge; the next 3 containers, dropped on the next weakest part, such as on a closure or welded longitudinal seam.) Along with the four foot drops, test No. 6, the loose cargo vibration, test No. 5, conducted in accordance with 49CFR at a temperature of 72 degrees F satisfies the POP requirements. NOTE: For economy, reasons, the POP four foot drops and loose cargo vibration are conducted as follow-on tests to the vibration/handling tests. POP testing requires that only one four foot drop test or a loose cargo vibration test be conducted per virgin container. If any container fails to meet the POP acceptance criteria after any four foot drop or loose cargo vibration, then a new container must be subjected to either a single drop at the failed drop orientation or the loose cargo vibration. After the above stated tests are conducted on 6 containers, an additional six loaded untested containers are required to perform test # 8 (forty foot drop) for hazardous materials only.

10.3.1.3 Level C CONUS interplant. The tests # 1, 2, 3, 5 and 6 as cited in Table I shall be performed sequentially on each packaged container. The number of containers (six), temperatures and exceptions required for the four foot drops or loose cargo vibration shall be as specified in 10.3.1.2.



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10.3.2 Packs weighing more than 150 pounds. See Table II.

10.3.2.1 Level B maximum. The tests 1 through 7 as cited in Table II, shall be performed sequentially on each packaged container. Unless otherwise specified, one (1) loaded container will constitute a test sample at each of the three temperatures specified in 10.5 for a total requirement of three (3) containers. The four foot drops, test No. 7, meet the requirements for Performance Oriented Packaging (POP) for hazardous materials and shall be performed as specified in Table II except that the six orientations of the four foot drop shall be performed at a temperature of 72 degrees F and two different drops per container. (NOTE: For circular containers (e.g. drums) the three containers for the four foot drop, test No. 7, shall be dropped as follows: two different drops per container, one drop on the weakest part, such as on a chime, or if no chime, on a circumferential seam or an edge and the second drop on the next weakest part, such as a closure or welded longitudinal seam.) Along with the four foot drops, test No. 7, the loose cargo vibration, test No. 6, conducted as part of the vibration/handling test, satisfies the POP requirements. NOTE: For economy reasons, the POP four foot drops are conducted as follow-on tests to the vibration/handling tests. POP testing requires that only one four foot drop test or a loose cargo vibration test be conducted per virgin container. If any container fails to meet the POP acceptance criteria after any four foot drop or loose cargo vibration then a new container must be subjected to either a single drop at the failed drop orientation or the loose cargo vibration. After the above stated tests are conducted on the three containers, an additional one (or two containers if temperature extremes affect packaged item, container or packaging material) loaded untested container(s) is (are) required to perform test No. 8 (forty foot drop) for hazardous materials only.

10.3.2.2 Level B standard. The tests #1, 2, 4, 5 6 and 7 as cited in Table II shall be performed sequentially on each packaged container. Unless otherwise specified, one (1) loaded containers will constitute a test sample at each of the three temperatures specified in 10.5 for a total requirement of three (3) containers. Along with the four foot drops, test No. 7, the loose cargo vibration, test No. 6, conducted in accordance with 49CFR at a temperature of 72 degrees F satisfies the POP requirements. NOTE: For economy reasons, the POP four foot drops and the loose cargo vibration are conducted as follow-on

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tests to the vibration handling tests. The number of containers (three), temperature and exceptions required for the four foot drops or the loose cargo vibration shall be as specified in 10.3.2.1. After the above stated tests conducted on the three containers, additional containers specified for the forty foot drop (test 8) shall be as specified in 10.3.2.1 for hazardous materials only.

10.3.2.3 Level C CONUS interplant. The tests # 1, 2, 3, 4, 5, 6 and 7 as cited in Table II shall be performed sequentially on each packaged container. Unless otherwise specified, one (1) loaded container will constitute a test sample at each of the three temperatures specified in 10.5 for a total requirement of three (3) containers. Along with the four foot drops, test No. 7, the loose cargo vibration, test No. 6, conducted in accordance with 49CFR at a temperature of 72 degrees F satisfies the POP requirements. NOTE: For economy reasons, the POP four foot drops and the loose cargo vibration are conducted as follow-on tests to the vibration handling tests. The number of containers (three), temperature and exceptions required for the four foot drop or the loose cargo vibration shall be as specified in 10.3.2.1.

10.4 Test material. Live and inert packaged items (equivalent mass and configuration) shall be tested, as applicable, in the exterior pack (unit of issue). Live packaged items will be used to the maximum extent possible and may be required for some tests. If, for safety reasons, a full load of explosive is deemed unacceptable, then live primers, fuzes or other explosive components can be used instead of the full-up explosive round but provisions must be made to determine if initiation took place during the test. All tested containers must have a full "load" (inert plus live) to bring the tested weight up to the as shipped load. A container requiring more live packaged items than available for the full load will have the live packaged items distributed within the exterior pack to produce test results equivalent to that expected if the entire load was live. These tests can be modified as required but the container shall be packed, sealed and tested as equivalent to the shipping configuration as possible. When the test item contains explosive materials or components, the test must be performed with proper procedures and equipment, consistent with the hazard level involved to provide adequate protection in case of explosion at any point in the performance of the test. These safety requirements apply to every test in this document when the

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test items contain any hazardous or explosive components or materials. At the conclusion of each test the acceptance criteria cited in 10.8 will apply, as stated in Table I or Table II, as applicable. It is obvious that some acceptance criteria will have to be subjective and will rely upon the packaging engineer to determine if the container performed satisfactorily. Once the container tests begin no major repair, retorque, or any modification to the container will be allowed without repeating the entire test. If the container does not pass any test without modification or rework it will be considered a failure in its present configuration and consideration should be given to stopping the tests and/or redesigning the container.

**10.5 Temperature.** The tests, except for the POP tests (four foot drops and loose cargo vibration) cited in Table I or Table II as applicable, and unless otherwise specified, shall be conducted at temperatures of +145 degrees F, +72 degrees F (ambient) and -30 degrees F for Level B maximum and standard and +125 degrees F, +72 degrees F (ambient) and -20 degrees F for Level C CONUS interplant. The four foot drops and loose cargo vibration, as applicable, which will meet the Performance Oriented Packaging requirements for hazardous materials shall be conducted at a temperature of 72 degrees F and are conducted last in any given test sequence. For a given test sequence, ambient temperature testing should be conducted first in order to evaluate container performance under a "less severe" environment. Low and high temperature testing should be conducted after ambient temperature testing. For the extreme temperatures, the packaged item shall be conditioned for a minimum of 16 hours for metallic containers and a minimum of 24 hours for nonmetallic (e.g. plastic) containers immediately prior to each test. During testing two temperature conditions can apply as noted below for the type of testing required.

**10.5.1 Maintaining air temperature.** By using portable conditioning equipment, the ambient air must be maintained at the specified temperature level for the duration of the secured vibration or loose cargo tests.

**10.5.2 Removal of conditioned packaged item.** For drop tests, the exterior pack containing the packaged item shall be conditioned and tested as quickly as possible after removal from the conditioned chamber to maintain the specified temperature level as closely as possible to the required value. No more than 2 to 3 minutes shall elapse before the first drop is conducted and no more than 8 to 10 minutes elapsed time before tests are completed in a given sequence (e.g. 6-3 foot drops).

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10.6 Test report. At the conclusion of testing a report shall be written documenting the test plan, equipment used, test results, inspection, deviation or waiver from the original test plan along with the reasons for the changes, and appropriate data. A suggested format for this report is as follows:

1. Purpose
2. Description of Tests
3. Criteria for Passing Tests
4. Test Equipment
5. Test Procedures
6. Related Information (deviation, waivers, etc.)
7. Supporting Data (temperature, performance requirements)
8. Test Results
9. Conclusion
10. Recommendations (if required)

10.7 Test equipment.

10.7.1 Capability. All equipment required for the tests must be capable of providing or meeting the conditions for the tests specified. A general description of the test equipment can be found in MIL-STD-1904.

10.7.2 Accuracy. The accuracy of instruments and test equipment used in control or monitor the test parameters shall be verified periodically (at least every 12 months, preferably once every 6 months, unless contractor procedures prepared to satisfy the requirements of MIL-STD-45662 or MIL-Q-9858 for calibration cycle of specific instruments specify otherwise) to the satisfaction of the packaging engineer. All instruments and test equipment used in conducting the tests specified herein shall:

1. Conform to laboratory standards whose calibration is traceable to the U.S. Bureau of Standards.
2. Have an accuracy of at least one-fourth the tolerance for the variable to be measured.
3. Be appropriate for measuring the conditions concerned.

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10.7.3 Tolerance of test conditions. The maximum allowable tolerance of test conditions (exclusive of accuracy of instruments) unless otherwise specified in any of the test procedures shall be as follows:

Temperature:	$\pm$ 5 degrees F (applies to hot/cold extreme temp)
	$\pm$ 20 degrees F (applies to 72 degrees F)

Vibration Acceleration Power	
Spectral Density:	$\pm$ 3 db
Velocity:	$\pm$ 5%
Distance:	$\pm$ 5%
Time:	$\pm$ 4%

10.7.4 Preconditioning and stabilization. The conditioning chamber shall be at the appropriate temperature in order to commence the conditioning period. At the conclusion of the specified soak time the container and its contents will be assumed to be at the correct temperature.

#### 10.8 Acceptance criteria for passing tests.

10.8.1 Packaged item-general. The basic criteria for passing a test is that the packaged item remain 1) safe, or 2) safe and operable. Each packaged container has its own unique criteria applicable to the test involved.

10.8.2 Packaged item and container under abnormal environment. At the conclusion of the test, no explosive element should have burned or detonated and packaged item should be safe to dispose of by applicable handling and disposal regulations without injury to personnel. Also, the container need not be functional.

10.8.3 Packaged item under normal environment. The packaged item shall be safe and operable at the conclusion of the test. The decision that the packaged item has met or failed to meet "safe and operable" is based upon breakdown, visual and radiographic inspection, firing or other appropriate tests together with engineering judgement. Mechanical or physical damage to the packaged item which precludes the normal function of the packaged item is cause for container rejection.

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10.8.4 Container under normal environment. The container shall not spill its contents. Minor damage to the exterior container, (inner container and/or internal dunnage, if applicable) is permissible. Examples of minor damage are: loose nails, split wood, bent box hardware, dents in fiber/plastic/metal containers, slight tears in protective liners or cracks in internal supports. The container must remain functional and suitable for its intended purpose. It is considered functional if it meets the following criteria:

1. The container cover must be capable of being unlatched, opened, reclosed and latched shut.
2. If required, handles, hoisting and tie down hardware are functional.
3. Stacking and/or handling capability is not impaired.
4. Packaged item support and protection are maintained.
5. Packaged item remains easy to remove and insert into container.

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TABLE I. Packs Weighing 150 Pounds or Less

TEST NUMBER	TEST NOMENCLATURE	LEVEL B MAXIMUM NOTE 1	LEVEL B STANDARD NOTE 1	LEVEL C CONUS NOTE 1	ACCEPTANCE CRITERIA
1	STACKING	MIL-STD-1904	MIL-STD-1904	MIL-STD-1904	10.8.1 -.3 -.4
2	VIBRATION (SECURED)	MIL-STD-1904	MIL-STD-810 (NOTES 2&3)	MIL-STD-810 (NOTES 2&3)	10.8.1 -.3 -.4
3	FREE FALL DROP (2 FT)	N/A	N/A	MIL-STD-1904 (NOTE 4)	10.8.1 -.3 -.4
4	FREE FALL DROP (3 FT)	MIL-STD-1904	MIL-STD-1904	N/A	10.8.1 -.3 -.4
5	LOOSE CARGO (BUMP)	MIL-STD-1904 (NOTE 9)	49CFR (NOTE 8)	49CFR (NOTE 8)	10.8.1 -.3 -.4
6	FREE FALL DROP (4 FT)	MIL-STD-1904 (NOTES 5,6,8)	MIL-STD-1904 (NOTES 5&8)	MIL-STD-1904 (NOTES 5&8)	10.8.1 -.3 -.4
7	FREE FALL DROP (7 FT)	MIL-STD-1904	N/A	N/A	10.8.1 -.3 -.4
8	FREE FALL DROP (40 FT)	MIL-STD-1904 (NOTE 7)	MIL-STD-1904 (NOTE 7)	N/A	10.8.1 -.2

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TABLE I. Packs Weighing 150 Pounds or Less

1. Unless otherwise specified, conduct tests at temperatures of -30 degrees F, +72 degrees F and +145 degrees F for Level B packs and -20 degrees F, +72 degrees F and +125 degrees F for Level C packs, see 10.5.
2. Perform test levels and conditions specified for Basic transportation, common carrier environment, vertical axis 514.3-1; transverse axis 514.3-2; longitudinal axis 514.3-3.
3. Unless otherwise specified, time per axis - Level B Standard/Level C CONUS - 2 hours.
4. Perform test in accordance with 3 Foot Free Fall Drop except that the drop height shall be 2 feet.
5. Perform test in accordance with 7 Foot Free Fall Drop except that the drop height shall be 4 feet and drop orientations as specified in 10.3.1.2. The 4 foot drops shall be conducted for packaged items containing hazardous materials to meet Performance Oriented Packaging (POP) requirements.  
(NOTE: For some hazardous materials 6 or 2.6 foot drops may be required in lieu of 4 feet.)
6. Not applicable if exterior pack meets POP requirements after seven foot drops.
7. Not applicable if item is non-hazardous.
8. Test shall be conducted at 72 degrees F.
9. Loose cargo in accordance with MIL-STD-1904 partially satisfies POP requirements. An additional 30 minutes of loose cargo with inputs in accordance with 49CFR at a temperature of 72 degrees F shall be conducted after the seven foot drops.



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TABLE II. Packs Weighing More Than 150 Pounds

TEST NUMBER	TEST NOMENCLATURE	LEVEL B MAXIMUM NOTE 1	LEVEL B STANDARD NOTE 1	LEVEL C CONUS NOTE 1	ACCEPTANCE CRITERIA
1	STACKING	MIL-STD-1904	MIL-STD-1904	MIL-STD-1904	10.8.1 -.3 -.4
2	VIBRATION (SECURED)	MIL-STD-1904	MIL-STD-810 (NOTES 2&3)	MIL-STD-810 (NOTES 2&3)	10.8.1 -.3 -.4
3	EDGEWISE DROP	MIL-STD-1904	MIL-STD-1904	MIL-STD-1904 (NOTE 5)	10.8.1 -.3 -.4
4	CORNERWISE DROP	MIL-STD-1904	MIL-STD-1904	MIL-STD-1904 (NOTE 5)	10.8.1 -.3 -.4
5	PENDULUM IMPACT	MIL-STD-1904	MIL-STD-1904	MIL-STD-1904	10.8.1 -.3 -.4
6	LOOSE CARGO	MIL-STD-1904	49CFR (NOTE 7)	49CFR (NOTE 7)	10.8.1 -.3 -.4
7	FREE FALL DROP (4 FT)	MIL-STD-1904 (NOTE 4 & 7)	MIL-STD-1904 (NOTES 4&7)	MIL-STD-1904 (NOTES 4&7)	10.8.1 -.3 -.4
8	FREE FALL DROP (40 FT)	MIL-STD-1904 (NOTE 6)	MIL-STD-1904 (NOTE 6)	N/A	10.8.1 -.2

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1. Unless otherwise specified, conduct tests at temperatures of -30 degrees F, +72 degrees F and +145 degrees F for Level B packs and -20 degrees F, +72 degrees F and +125 degrees F for Level C packs, see 10.5.
2. Perform test levels and conditions specified for Basic transportation, common carrier environment, vertical axis 514.3-1; transverse axis 514.3-2; longitudinal axis 514.3-3.
3. Unless otherwise specified, time per axis - Level B Standard/Level C CONUS - 2 hours.
4. Perform test in accordance with 7 Foot Free Fall Drop except that the drop height shall be 4 feet and drop orientations as specified in 10.3.2.1. The 4 foot drops shall be conducted only for packaged items containing hazardous materials to meet Performance Oriented Packaging requirements. (NOTE: For some hazardous materials 6 or 2.6 foot drops may be required in lieu of 4 feet.)
5. Test applies except that the drop heights shall be 12 and 24 inches.
6. Not applicable if the item is non-hazardous.
7. Test shall be conducted at 72 degrees F.

MIL-STD-1905A (AR)

Custodian:  
Army-AR

Preparing activity:  
Army-AR

(Project 8140-A844)

# STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

## INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete blocks 4, 5, 6, and 7.

3. The preparing activity must provide a reply within 30 days from receipt of the form.

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**I RECOMMEND A CHANGE:**

1. DOCUMENT NUMBER

MIL-STD-1905A (AR)

2. DOCUMENT DATE (YYMMDD)

1 April 1992

3. DOCUMENT TITLE

DESIGN AND TEST REQUIREMENTS FOR LEVEL B AND LEVEL C AMMUNITION PACKAGING

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets if needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)

b. ORGANIZATION

c. ADDRESS (Include Zip Code)

d. TELEPHONE (Include Area Code)

(1) Commercial

(2) AUTOVON  
(If applicable)

7. DATE SUBMITTED  
(YYMMDD)

8. PREPARING ACTIVITY

a. NAME

US ARMY ARDEC  
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