

NOTE: MIL-STD-1455A has been redesignated as a handbook, and is to be used for guidance purposes only. This document is no longer to be cited as a requirement. For administrative expediency, the only physical change from MIL-STD-1455A is this cover page. However, this document is no longer to be cited as a requirement. If cited as a requirement, contractors may disregard the requirements of this document and interpret its contents only as guidance.

NOT MEASUREMENT SENSITIVE

MIL-HDBK-1455  
14 February 1997  
SUPERSEDING  
MIL-STD-1455A  
1 June 1985

## DEPARTMENT OF DEFENSE HANDBOOK



### DISPENSER AND SUB-MUNITION, AIR DELIVERED, SAFETY DESIGN AND SAFETY QUALIFICATION CRITERIA FOR

THIS HANDBOOK IS FOR GUIDANCE ONLY  
DO NOT CITE THIS DOCUMENT AS A REQUIREMENT

AMSC N/A

FSC 1345

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

**MIL-STD-1455A**

**DEPARTMENT OF DEFENSE  
WASHINGTON, DC 20301**

**Dispenser and Sub-Munition, Air Delivered,  
Safety Design and Safety Qualifications Criteria for MIL-STD-1455**

- 1. This Military Standard is mandatory for use by all Departments and Agencies of the Department of Defense.**
- 2. Recommended corrections, additions, or deletions should be addressed to the Commanding Officer, Picatinny Arsenal, ATTN: SMUPA-ND5, Dover, New Jersey 07801**

## FOREWORD

1. This standard has been prepared to meet a two-fold need: (1) to establish safety guidelines for the development of a growing family of dispenser munition and their associate submunitions, and (2) to establish common guidelines and evaluation methods to assist in development of munitions which possess adequate safety for tri-service usage.

2. Dispensers which are capable of dispensing submunitions are receiving a high-priority for development because of their effectiveness. Uniform distribution of the submunitions over a given area provides increased effective accuracy for the majority of targets and increases the effective area coverage for a given payload. These advantages are provided at the cost of increased complexity of operation and fuzing. The safety of logistics and deployment of such munitions must be carefully considered. This document is intended to assist in the development of safe munitions; but, because of unique and varying design and operational requirements, additional safety criteria should be considered for specific munitions.

3. DOD has increased emphasis on commonality of service items. The increased development activity and potential of interchangeable submunitions provide a further stimulus for commonality provisions. This document represents the minimum requirements agreed upon by the Army, Air Force, and Navy. Complete and full adherence to this document will assure commonality.

MIL-STD-1455A

## CONTENTS

PARAGRAPH

1.	SCOPE
1.1	PURPOSE
1.2	CLASSIFICATION
2.	APPLICABLE DOCUMENTS
3.	DEFINITIONS
4.	SAFETY DESIGN CRITERIA
4.1	CLASSIFICATION OF CRITERIA
4.2	GENERAL DESIGN CRITERIA
4.3	DETAILED DESIGN CRITERIA
4.3.1	DISPENSER AND SUBMUNITION DESIGN CRITERIA
4.3.1.1	FUZING CRITERIA
4.3.1.1.1	FREE FALL DISPENSER FUZING CRITERIA
4.3.1.1.2	CAPTIVE DISPENSER FUZING CRITERIA
4.3.1.1.3	SUBMUNITION CLUSTER FUZING CRITERIA
4.3.1.1.4	SUBMUNITION FUZING CRITERIA
4.3.1.1.5	ADDITIONAL COMMON FUZE CRITERIA
4.3.1.2	AIRCRAFT COMPATIBILITY CRITERIA
4.3.1.3	FLIGHT ENVIRONMENT CRITERIA
4.3.1.4	MUNITION DEPLOYMENT CRITERIA
4.3.1.5	LOGISTIC HANDLING CRITERIA
4.3.1.6	LOGISTIC ENVIRONMENTAL STORAGE CRITERIA

MIL-STD-1455A

5.	SAFETY QUALIFICATION/VERIFICATION/DOCUMENTATIONS REQUIREMENTS
5.1	CLASSIFICATION OF TEST METHODS
5.1.1	DEVELOPMENT TESTS
5.1.2	QUALIFICATION TESTS
5.2	SYSTEM SAFETY PROGRAM
5.3	DATA PACKAGE REQUIREMENTS
TABLE I	SAFETY QUALIFICATION/VERIFICATION TESTS
TABLE II	SAMPLE SCEHDULES FOR SAFETY QUALIFICATION TESTS

MIL-STD-1455A

1. SCOPE

1.1 PURPOSE - This specification establishes basic safety design and safety qualification criteria for air delivered dispensers and the associated submunitions.

1.2 CLASSIFICATION - This standard applies to free-fall dispensers, and associated submunitions and submunition clusters. This standard does not apply to submunitions containing chemical agents designed to produce toxicological effects, biological submunitions, and nuclear submunitions. If an air delivered propulsive weapon incorporates a submunition payload section as part of the overall weapon air vehicle, then the submunition payload section shall be considered to be either a free-fall dispenser or a submunition cluster as defined by the procuring activity. As such the criteria of either paragraph 4.3.1.1.1 or 4.3.1.1.3 and the criteria of paragraph 4.3.1.1.4 shall apply to the submunition payload section.

2. APPLICABLE DOCUMENTS

2.1 The issues of the following documents in effect on the date of invitation for bids for a part of this standard to the extent specified herein.

STANDARDS

MIL-STD-331	Fuze and Fuze Components, Environmental and Performance Test for
MIL-STD-444	Nomenclature and Definitions in the Ammunition Area
MIL-STD-461	Electromagnetic Interference Characteristics Requirements for Equipment
MIL-STD-462	Electromagnetic Interference Characteristic, Measurement of
MIL-STD-810	Environmental Test <del>Methods</del>
MIL-STD-882	System Safety Program for Systems and Associated Subsystems and Equipment; <del>Requirements for</del>
MIL-STD-1316	Fuze Design, Safety Criteria for
MIL-STD-1385	Preclusion of Hazards from Electromagnetic Radiation to Ordnance, General Requirements for
MIL-STD-1512 <i>with</i>	Electroexplosive Subsystems, Electrically Initiated, Design Requirements and Test Methods
DOD-STD-2105 (Navy)	Hazard Assessment Tests For Navy Non-Nuclear Ordnance

SPECIFICATIONS

MIL-E-6051	Electromagnetic Compatibility Requirements, System
MIL-A-8591	Airborne Stores and Associated Suspension Equipment; General Design Criteria for
MIL-D-21625	Design and Evaluation of Cartridges for Cartridge Actuated Devices
MIL-I-23659	Initiators, Electric, Design and Evaluation of
MIL-B-81006	Bomb, Free-Fall, Demonstration of Dispersion Requirement for
MIL-D-81303	Design and Evaluation of Cartridges for Stores Suspension Equipment

OTHER PUBLICATIONS

AFSC DH 1-6	Design Handbook, Series 1-0 General AFSC DH 1-6 System Safety
AFSC DH 2-5	Design Handbook, Series 2-0 Aeronautical Systems DH 2-5 Armament
DSAR 8220.1	Explosive Hazard Classification Procedures
NAVWEP WR-50	Warhead Safety Test, Aluminum for Air, Surface and Underwater Launched Weapons
NAVAIRINST 3710.7	Aircraft/Store Compatibility and Flight Operating Limitations for Aircraft Carrying Stores

MIL-STD-1455A

**3. DEFINITIONS**

3.1. The definitions of MIL-STD-444 apply to munition terms used in this standard. The following definitions shall apply to this standard.

3.1.1 Accidental Release - Dispenser or submunition ejection occurring by means other than intended. Accidental release tests simulate ejection during aircraft launch and recovery conditions over hard surfaces.

3.1.2 Captive Dispenser - A dispenser which remains affixed to or held within the aircraft during dispensing and dispersion of the associated submunitions or submunition cluster.

3.1.3 Commonality - Commonality provisions herein are directed toward maximum practical interservice design standardization and interchangeability.

3.1.4 Dispenser - Part of a weapons system containing submunitions or other items which are released, by internal functioning of the dispenser, for delivery onto a target.

3.1.5 Free Fall Dispenser - A specific type of dispenser, one which during and after separation from the delivery vehicle remains non-propulsive. However, the dispenser may release energy for the dispensing and dispersing of its payload.

3.1.6 Safe Separation Distance - A space relationship between delivery vehicle and weapon, following release, where injury to personnel or damage to the vehicle shall not exist if the weapon should function.

3.1.7 Safe Jettison - Release and separation of a munition of which the fuze remains in an unarmed condition during free fall and ground impact and does not initiate the functioning of the munition.

3.1.8 Safe Separation - The parting of a store, submunition, suspension equipment, or portions thereof, from an aircraft without exceeding the design limits of the aircraft or anything carried thereon, and without damage to, contact with, or unacceptable adverse effects on the aircraft or other stores.

3.1.9 Shall - Indicates a provision that is binding.

3.1.10 Should - Indicates a provision that is nonmandatory but highly desirable.

3.1.11 Submunition - The basic kill mechanism of the dispenser munition.

3.1.12 Submunition Cluster - A number of submunitions connected together to form a subpack or a similar form of assembly which is ejected or released from the dispenser as a single item.

MIL-STD-1455A

**4. SAFETY DESIGN CRITERIA**

**4.1 CLASSIFICATION OF CRITERIA**- Safety design criteria are classified into areas of general and detailed design criteria. The general design criteria present information required as a result of this specification. The detailed design criteria present the criteria which are necessary to assure compliance with requirements of Section 5.

**4.2 GENERAL DESIGN CRITERIA** - The developer shall record and compile the following data in accordance with the provisions of this specification in an orderly and timely fashion:

(a) Any and all information available concerning safety problems not covered by Sections 4 and 5 of this specification,

(b) Substantiating information which specifies the reason for and anticipated consequences of any departure or waiver from this specification,

(c) A complete report of the development and qualification inspections and supplemental information as required in Section 5.3.

**4.3 DETAILED DESIGN CRITERIA** - The detailed design criteria address design safety of the dispenser and of the submunitions. The detailed design criteria are subdivided into areas of fuzing, aircraft compatibility, flight environment, munition deployment, logistic handling, and logistical environmental storage.

**4.3.1 DISPENSER AND SUBMUNITION DESIGN CRITERIA**

**4.3.1.1 FUZING CRITERIA** - It is the intent of the fuze design criteria to assure safety of the dispenser weapon through all phases of its life cycle up to the point of weapon/aircraft safe separation distance. The fuzing (fuzes) of a dispenser munition is usually comprised of several "fuze", i.e., the dispenser fuze (for opening of a free fall dispenser) and the individual submunition fuzes. Captive dispensers do not contain a "fuze" per se but shall contain adequate safety devices. These devices are designed not only to eject the munition payload upon command but also to prevent an inadvertent ejection of the munition payload as well. In evaluating the safety of a dispenser munition "fuzing" system, each fuzing subsystem must be considered with respect to the overall system. The entire fuzing system, i.e., the synergistic functioning of dispenser, submunition cluster, and submunition fuzing components, shall satisfy the criteria of MIL-STD-1316. Significant design criteria for each area of dispenser, submunition cluster, and submunition fuze design are given below.

**4.3.1.1.1 FREE FALL DISPENSER FUZING CRITERIA - The fuze shall be designed in accordance with the following:**

(a) After separation from the aircraft, the dispenser shall provide for safe separation. Also, dispenser fuze arming shall be delayed:

(1) To provide safe aircraft separation relative to submunition release from the dispenser, and

(2) To provide dispenser fuze contribution to total safe separation distance requirements relative to submunition detonation.

(b) The fuze shall be designed such that jettisoning is possible with the fuze in the safe condition. The fuze shall remain safe after impact. It is desired that a high order detonation or chemical dispersion will not occur upon ground impact of the dispenser.

(c) Operation of at least two arming devices shall not occur until one has sensed or been actuated by intentional separation from the aircraft and one has sensed or been actuated by a unique flight or free fall environment and these events have occurred in the order given.

(d) Velocity sensors, if used, shall require a minimum air velocity for operation set as far above non-flight conditions as can reasonably be done without endangering operability.

**4.3.1.1.2 CAPTIVE DISPENSER FUZING OR SAFING CRITERIA - Fuzing or safing for captive dispensers shall be designed in accordance with the following:**

(a) The dispenser ejection mechanism shall require: (1) a continued input signal for the entire ejection sequence, the termination of ejection may be accomplished via termination of the input signal, or (2) a pulse signal, sensibly longer than any possible transient pulses generated in or near the aircraft, to initiate the dispenser ejection sequence, or (3) a system of clear unambiguous digital coded pulses, subject to repetition and crosschecking immediately prior to initiation of the dispenser ejection sequence.

(b) The ejection system shall incorporate a positive safety device interrupting the command signal prior to intentional removal of the ground safety device.

(c) If electro-explosive devices are utilized in the ejection system, they shall be as insensitive to extraneous voltage as performance requirements will allow. Guidelines are provided in MIL-D-21625, MIL-I-23659, MIL-D-81303, and MIL-STD-1512

MIL-STD-1455A

(d) Operation of the dispensing mechanism shall not occur until both of the following conditions are satisfied: (1) a unique flight environment has been sensed by the dispenser or a flight induced logic generated by the aircraft has been sensed by the dispenser, and (2) an intentional command from the pilot or fire control system has been received by the dispenser.

(e) Velocity sensors, if used by the dispenser to sense the flight environment, shall require a minimum air velocity for operation set as far above non-flight conditions existing external to the dispenser as can reasonably be done without endangering operability.

(f) The ejection system should incorporate a "feed-back" loop to the aircraft to indicate that all submunitions or submunition clusters have been dispensed.

**4.3.1.1.3 SUBMUNITION CLUSTER FUZING CRITERIA - The following shall apply to submunition cluster fuzing components/functions:**

(a) The mechanism which causes submunitions to be released from the submunition cluster shall require that the submunition cluster be released from the dispenser.

(b) Release of the submunition cluster from the dispenser shall provide safe separation relative to the aircraft.

(c) Following release from the dispenser, submunition cluster functioning shall be delayed:

(1) To provide safe aircraft separation relative to submunition release, and

(2) To provide the submunition cluster contribution to total safe separation distance requirements relative to submunition detonation.

(d) If dispersion of the submunition from the submunition cluster is forceful (i.e., may result in personnel injury or property damage), then one of the following is required:

(1) The submunition cluster shall require sensing a unique free-flight environment prior to submunition release, or

(2) The submunition cluster shall, prior to submunition release, receive an input from the dispenser fuze, this input having been generated by sensing a unique free-flight environment.

**4.3.1.1.4 SUBMUNITION FUZING CRITERIA - The following shall apply to submunition fuzing:**

(a) Actuation of at least one arming device of the submunition fuze shall require one of the following:

MIL-STD-1455A

(1) Sensing of a unique free-flight environment following submunition release from the dispenser or submunition cluster.

(2) Receipt by the submunition fuze of an input from the dispenser or submunition cluster fuze, this input having been generated by sensing a unique free-flight environment.

(b) Velocity sensors, if used, shall require a minimum air velocity for operation set as far above non-flight conditions existing external to the dispenser as can reasonably be done without endangering operability.

(c) An additional lock against submunition arming should be provided by assembly of the submunition into the dispenser or submunition cluster. This lock shall be released by separation or dispersion of the submunition. This design criterion shall be incorporated in the submunition fuze if option 4.3.1.1.4(a)(2), above is selected.

(d) Submunition arming shall be delayed until the submunition fuze contribution to overall safe separation distance requirements is satisfied.

(e) Visual safe-arm indications are desirable. If visual checks are not feasible, a procedure following assembly of the fuzed submunition shall be provided to assure that no armed submunitions are loaded into dispensers or clusters.

(f) Provisions should be made to make it impossible to assemble the submunitions in the armed condition.

(g) If a submunition incorporates a propulsion subsystem, then the criteria of paragraphs 4.3.1.1.4 (a) through (c) above, shall apply to propulsion subsystem ignition. In this case, the post-ignition environment could serve as the unique free-flight environment required for submunition fuze arming.

**4.3.1.1.5 ADDITIONAL COMMON FUZE CRITERIA** - The fuzes or fuzing shall also meet the requirement of:

(a) A five-foot bare drop.

(b) Ruggedness as imposed by jolt and jumble tests.

(c) Effectiveness testing of the explosive train interrupter.

(d) If electro-explosive devices are utilized in the release system, they shall be as insensitive to extraneous voltage as performance requirements will allow. Guidelines are provided in MIL-D-2165, MIL-I-23659, MIL-D-81303, and MIL-STD-1512.

MIL-STD-1455A.

**4.3.1.2. AIRCRAFT COMPATIBILITY CRITERIA - The dispenser and submunition design shall provide for:**

(a) Store geometry and strength conforming with MIL-A-8591.

(b) Safe stability, control, and flying qualities.

(c) Shipboard suitability of the aircraft with stores aboard, including storage compatibility of the store and ship (where applicable, see NAVAIRINST 3710.7).

(d) Safe carriage release, and jettison characteristics.

(e) Safe separation of any and all dispenser and submunition ejecta. This includes safe jettisoning considerations for captive dispensers. The dispensing sequence, if not simultaneous, should attempt to maintain the normal center of gravity for safe separation if jettisoning is required. If the captive dispenser is non-jettisonable, the submunitions or clusters should be capable of safe jettisoning. The capability for safe jettisoning should be available at any time during the ejection sequence.

(f) The dispenser/aircraft electrical interface should be in accordance with MIL-E-6051 or other applicable documents (see MIL-STD-461 and MIL-STD-462).

(g) Commonality for tri-service usage shall be considered in the selection of control and release mechanisms and functioning sequences.

**4.3.1.3. FLIGHT ENVIRONMENT CRITERIA - The dispensers and submunition designs shall contain safety provisions for the following:**

(a) Aerodynamic heating encountered at planned operational speeds.

(b) Mechanical, aerodynamic, and acoustic vibration induced by flight environments.

(c) Mechanical shock environments.

(d) Bullet impact and related explosive propagation damage in flight configurations as required.

(e) Electromagnetic field intensities encountered in operational environments (HERO).

(f) Thermal shock environments.

(g) Explosive decompression potential of flight environments (if applicable).

MIL-STD-1455A

**4.3.1.4 MUNITION DEPLOYMENT CRITERIA** - The stores deployed from the delivery vehicle shall be designed such that predictable ballistic profiles and hazardous ground envelopes can be determined to provide a safe ground support capability (see MIL-B-81006).

**4.3.1.5 LOGISTIC HANDLING CRITERIA** - The dispenser and submunition design shall be capable of safely meeting the following:

(a) Cook-off test criteria designed to provide a maximum capability for the severe problems of heat and flame.

(b) Impact loads of various types including shock tests and drop tests of up to 40 feet in an as shipped and packaged configuration.

(c) Transportation vibration environments.

(d) Bullet impact criteria (covered by criteria of Section 4.3.1.3(d)).

(e) Electromagnetic criteria (covered by criteria of Section 4.3.1.3 (e)).

**4.3.1.6 LOGISTIC ENVIRONMENTAL STORAGE CRITERIA** - The dispenser and submunition design shall be capable of safely meeting the environment of:

(a) Temperature and humidity

(b) High temperature

(c) Low temperature

(d) Humidity

(e) Waterproofness

(f) Rain

(g) Fungus

(h) Salt spray or fog

(i) Sand and Dust

**5. SAFETY QUALIFICATION/VERIFICATION/DOCUMENTATION REQUIREMENTS**

**5.1 CLASSIFICATION OF TEST METHODS** - Testing of the dispenser and submunitions shall be classified as development or qualification tests. Table I contains a compendium of tests considered satisfactory for individual or tri-service qualification.

5.1.1 DEVELOPMENT TESTS - Sufficient testing during weapon development should be conducted to assure that the final design is capable of meeting the tests of Section 5.1.2.

5.1.2 QUALIFICATION TESTS - Qualification testing shall be mandatory prior to safety release of the dispenser and submunitions for production or service use. The qualification tests for safety release do not address performance and reliability requirements. Qualification tests shall consist of the test methods as specified in Table I unless waivers/ deviations are authorized by the sponsoring service. A typical schedule and sequence of testing is provided in Table II for information purposes. Additional safety qualification tests may be required of specific weapons.

5.2 SYSTEM SAFETY PROGRAM - The requirements for system safety programs are given in MIL-STD-882, System Safety Program for System and associated Subsystems and Equipment, Requirements for. The system safety criteria developed in accordance with MIL-STD-882 may impose additional requirements or objectives on the fuze design.

5.3 DATA PACKAGE REQUIREMENTS - To assure adequate safety review and to aid commonality of the subject items, the developer shall compile a data package which documents the test methods and results obtained during development and qualification tests. This data package shall be supplemented by an available technical design data package containing but not restricted to design limitations, functioning sequences and failure mode or fault tree analysis. Guidelines are provided in MIL-STD-882 and AFSC DE 1-6.

Custodian:  
Army-AR  
Navy-AS  
Air Force-18

Preparing Activity  
Airforce-18

Review Activities  
Army-MU  
Navy-AS  
Air Force-18

TABLE I. SAFETY QUALIFICATION/VERIFICATION TESTS

<u>TYPE OF TEST</u>	<u>TEST METHOD</u>	<u>TEST ITEM CONFIGURATION</u>
<b>FUZE SAFETY REQUIREMENTS</b>		
Max. no arm velocity (when applicable)	No established test method, determined normally by wind tunnel testing.	Dispenser (bare), submission cluster (bare), submunition (bare).
Five foot drop	MIL-STD-331 - Test 111	Dispenser and submunition cluster fuzes (bare), sub- munition fuze (bare or assembled).
Jolt	MIL-STD-331 - Test 101	Dispenser and submunition cluster fuzes (bare), sub- munition fuze (bare or assembled).
Jumble	MIL-STD-331 - Test 102	Dispenser and submunition cluster fuzes (bare), sub- munition fuze (bare or assembled).
Static Detonator Safety	MIL-STD-331 - Test 115	As specified in test method or other suitable test methods.
Temperature Humidity	MIL-STD-331 - Test 105	Dispenser, Submunition Cluster, and submunition fuzes (bare).
<b>AIRCRAFT COMPATIBILITY REQUIREMENTS</b>		
Captive Flight	Determined by flight testing	All-up round (bare).
Acceleration	MIL-STD-810 - Test 513	All-up round (bare).
Catapult and Arrested Landing	MIL-STD-331 - Test 212 (as required)	All-up round (bare).
Ground fit check	Determine for specific aircraft	All-up round (bare).

\*MIL-STD-331 Test Method 212 to be employed using acceleration, deceleration loads taken from MIL-A-8591.

TABLE I. SAFETY QUALIFICATION/VERIFICATION TESTS  
(Continued)

<u>TYPE OF TEST</u>	<u>TEST METHOD</u>	<u>TEST ITEM CONFIGURATION</u>
<b>Aircraft</b>		
Safe Separation	Determined by flight testing specific aircraft.	All-up round (bare), captive dispenser (empty and worst case of various stages of fill).
Safe Separation Distance	Determined from arena tests and arming time evaluations.	Submunitions (bare), total free fall arming time to be considered.
Safe Jettison	MIL-STD-331 - Applicable tests of 201 - 205 series.	All-up round (bare).
Accidental Release	MIL-STD-331 - Test 206	All-up round (bare).
<b>FLIGHT ENVIRONMENT REQUIREMENTS</b>		
Aerodynamic Heating	Determined by submission of item to expected captive flight thermal profiles.	All-up round (bare).
<b>Vibration</b>		
Mechanical	MIL-STD-810 - Test 514 Schedules as applicable.	All-up round (bare). Submunition (bare), Submunition Cluster (bare).
Acoustic	MIL-STD-710 - Test 515 Schedules as applicable.	All-up round (bare), partially filled dispenser required as applicable.
Shock	MIL-STD-810 - Test 516 Procedure V	All-up round (bare).

TABLE I. SAFETY QUALIFICATION/VERIFICATION TESTS  
(Continued)

<u>TYPE OF TEST</u>	<u>TEST METHOD</u>	<u>TEST ITEM CONFIGURATION</u>
Bullet Impact	DOD-STD-2105 (Navy)	All-up round (bare), submunition (bare).
Propagation	DSAR 8220.1 - Tests A & B	All-up round (bare).
HERO	DOD-STD-1385, MIL-STD-462	All-up round (various logistic configurations).
Temperature Shock	MIL-STD-810 - Test 503	All-up round (bare).
Low Pressure (Altitude)/	MIL-STD - Test 500 Procedures I and III (as required).	All-up round or submunition (bare).
<b>LOGISTIC HANDLING COMPATIBILITY REQUIREMENTS</b>		
<b>Cook-off Tests</b>		
Fast	DOD-STD-2105 (Navy)	All-up round (bare).
Slow	DOD-STD-2105 (Navy) (as required)	All-up round (bare).
Bullet Impact	DOD-STD-2105 (Navy) (depend- ent upon bullet impact results environment requirements.*	All-up round (packaged).
Propagation	DSAR 8220.1 (dependent upon propagation results from flight environment require- ments).	All-up round (packaged).

\*Test Method of NAVWEP-WR-50 to employ short burst of several rounds when feasible.

TABLE I. SAFETY QUALIFICATION/VERIFICATION TESTS  
(Continued)

<u>TYPE OF TEST</u>	<u>TEST METHOD</u>	<u>TEST ITEM CONFIGURATION</u>
Impact		
Shock	MIL-STD-810 - Test 516 Procedure II	All-up round (packaged), Submunition clusters or submunitions when applicable (packaged).
Drop		
40 ft.	MIL-STD-331 - Test 103	All-up round (bare or packaged as applicable).
Transportation Vibration	MIL-STD-810 - Test 514 Procedure I	All-up round (packaged).
LOGISTIC ENVIRONMENTAL REQUIREMENTS	Tests to be selected and conducted as appropriate	Test item configurations to be selected on basis of munition design and expected logistics.
Temperature and Humidity	MIL-STD-331 - Test 105	
High Temperature	MIL-STD-810 - Test 501	
Low Temperature	MIL-STD-810 - Test 502	
Humidity	MIL-STD-810 - Test 507 Procedure I	
Waterproofness	MIL-STD-331 - Test 108	
Rain	MIL-STD-810 - Test 506	
Fungus	MIL-STD-810 - Test 508	

TABLE I. SAFETY QUALIFICATION/VERIFICATION TESTS  
(Continued)

<u>TYPE OF TEST</u>	<u>TEST METHOD</u>	<u>TEST ITEM CONFIGURATION</u>
Salt Fog	MIL-STD-810 - Test 509	
Sand and Dust	MIL-STD-810 - Test 510	
Dust	MIL-STD-331 - Test 116	

MIL-STD-1455A

TABLE II. SAMPLE SCHEDULES FOR SAFETY QUALIFICATION TESTS

TEST DESCRIPTION (refer to Table I for test method)	QUALIFICATION TEST SCHEDULES*											
	1 Test schedules	2 1-8 are for all-up rounds or clusters as applicable.	3	4	5	6	7	8	9 Test schedules 9-11 are for submunitions only	10	11	12 Test schedule 12 is for dispenser, cluster, and bomblet fusing systems**
Temperature and Humidity	X								X			
High Temperature		X										
Low Temperature			X									
Salt Spray			X								X	
Humidity			X									
Thermal Shock				X								
Sand and Dust					X						X	
Dust						X						
Waterproofness***										X		
Fungus								X		X		
Rain		X							X			
Transportation Vibration	X											
Mechanical Vibration			X									
Acoustic Vibration		X										
Acceleration				X					X			
Aerodynamic Heating					X							
Impact Shock					X							
Hero						X						
Explosive Decompression								X				
Captive Flight								X				
Safe Separation								X				
Catapult and Arrested Landing							X					
Jolt									X			X
Jumble									X			X
5 Foot Drop										X		X
40 Foot Drop	X											X
Bullet Impact			X								X	
Propagation		X										
Slow Cook-Off				X								
Fast Cook-Off						X						
Shock					X							
Safe Jettison								X				
Accidental Release							X					
Static Detonator Safety									X			X
Safe Escape										X		
Max. No-Arm Velocity												X

\*Each schedule gives tests to be conducted and tests are to be sequenced as listed. The number of items to be subjected to each schedule shall be determined by the test in the sequence which requires the maximum number of items.

\*\*This schedule is not in sequence, test only when applicable and not previously conducted.

\*\*\*This item to be tested last, item to be disassembled after test.

**MIL-STD-1455A**

**Custodians:**

Navy - AS  
Air Force - 18  
Army - AR

**Preparing Activity:**

Air Force - 18

**Reviewing Agency:**

Navy - AS  
Air Force - 18  
Army - AR

**Project Number:**

1345 - 0279