MIL-C-4150H
22 Sep 1977
SUPERSEDING
MIL-C-4150G
28 July 1971

MILITARY SPECIFICATION

CASES, TRANSIT AND STORAGE, WATERPROOF AND WATER-VAPORPROOF

(This specification is mandatory for use by all Departments and Agencies of the Department of Defense.)

1. SCOPE

1.1 Scope. This specification covers rigid, reusable, waterproof and water-vaporproof, rectangular cases manufactured from ferrous or non-ferrous metals or non-metallic materials such as glassfiber reinforced plastics or other compounded, non-metallic materials that meet the requirements specified herein. The cases serve as combination transit and storage containers for loads up to 250 pounds (113 kilograms). For loads over 250 pounds (113 kilograms), approval of the procuring activity is required. This specification establishes a satisfactory level of ruggedness for only the transit case when used within its load limitations. Protection to the intended contents must be further considered by attention to the fragility of the item and the design characteristics of the cushioning material.

1.2 Classification. The cases covered by this specification shall be furnished in the following types, styles, classes, and variety, as specified (see 6.2).

Type I - Waterproof
Type II - Water-vaporproof

Style 1 - Transit case
Style 2 - Combination case
Style 3 - Console case
Style 4 - Special designs

Class A - For maximum gross weight up to 150 pounds (68 kilograms)
Class B - For maximum gross weight over 150 pounds (68 kilograms)

Variety NHC - Non-hinged closure
Variety HC - Hinged closure
Variety SHC - Sliding (removable) hinge closure

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Air Force Packaging Evaluation Agency, AFALD/PTP, Wright-Patterson AFB OH 45433, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 8115

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

Federal

QQ-A-250/11	Aluminum Alloy 6061, Plate and Sheet
QQ-P-416	Plating, Cadmium (Electrodeposited)
TT-E-489	Enamel, Alkyd, Gloss (For Exterior and Interior Surfaces)
TT-E-527	Enamel, Alkyd, Lusterless
TT-E-529	Enamel, Alkyd, Semi-Gloss
PPP-B-636	Box, Shipping, Fiberboard
PPP-T-76	Tape, Pressure-sensitive, Adhesive, Paper, Water Resistant, (For Carton Sealing)

Military

MIL-D-1000	Drawings, Engineering and Associated Lists
MIL-A-8625	Anodic Coating, for Aluminum and Aluminum Alloys
MIL-E-15090	Enamel, Equipment, Light-Gray (Formula No. 111)
MIL-P-15328	Primer (Wash), Pretreatment, Blue (Formula No. 117-B For Metals)
MIL-I-26860	Indicator, Humidity Plug, Color Change

STANDARDS

Federal

Federal Test Method Standard No. 101	Preservation, Packaging and Packing Materials: Test Procedures
Federal Standard 595	Colors

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-143	Standards and Specifications, Order of Precedence for the Selection Of

(Copies of specifications and standards required by suppliers in connecting 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 or request for proposal shall apply.

Uniform Classification Committee, Agent:

Uniform Freight Classification.

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago IL 60606.)

National Motor Freight Traffic Association, Incorporated, Agent:

National Motor Freight Classification.

(Application for copies should be addressed to the American Trucking Association, Inc., (Traffic Department), 1616 P Street, N.W., Washington DC 20336.)

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

3. REQUIREMENTS

3.1 First article inspection. This specification makes provisions for first article inspection (see 4.3).

3.2 Materials. Materials used in manufacturing these cases shall conform to the requirements specified and specifications referenced herein. Materials which are not covered by specifications or which are not specifically described herein shall be of the lightest practicable weight, and entirely suitable to enable the cases to meet all the performance requirements specified herein. The water-vapor transmission rate of materials used for the Type II case shells shall not exceed 0.050 grams per 100 square inches per 24 hours (0.775 grams/meters^2 x 24 hours).

3.2.1 Metals. Metals shall be of the corrosion-resistant type, unless suitably protected to withstand the tests specified herein. Dissimilar metals shall not be used in intimate contact unless suitably protected against electrolytic corrosion. When it is necessary that any combination of such dissimilar metals be assembled, an interposing material compatible to each shall be used. When aluminum alloy is used in the case it shall have corrosion resistant properties at least equal to 6061 aluminum in accordance with QQ-A-250/11.

3.2.2 Non-metallic materials. Glass fiber reinforced plastics or other compounded non-metallic materials used in the manufacturing of these cases shall be suitable for the purpose intended and meet the overall requirements of 3.2.

3.2.2.1 Strength properties. Non-metallic materials shall have minimum strength properties as set forth in table I (see 4.5).

TABLE I

Strength properties		
	pounds per square inch	kilograms per square centimeter
Tensile strength	* 22,000	* 1546.7
Compressive strength	* 18,000	* 1265.5
Flexural strength	* 30,000	* 2109.4

* Denotes dry test conducted at room temperature with material in condition of ultimate use (molded, cast, drawn, etc.).

3.2.3 Protective treatment. When materials used in the construction of the case are subject to deterioration when exposed to environmental conditions likely to occur during service usage, they shall be protected against such deterioration in a manner that will in no way prevent compliance with the performance requirements of this specification. The use of any protective coating that will crack, chip, or scale with age or environmental conditions shall be avoided. Where unpainted aluminum is used, it shall be protected in accordance with MIL-A-8625, Type II finish. All brass and steel parts shall have a class I, Type II finish in accordance with QQ-P-416.

3.2.4 Fungus-proof materials. Materials which are nutrients for fungi shall not be used in the construction of cases procured under this specification.

3.3 Standard parts. MIL-STD-143 shall govern the selection and use of standard parts. AN or MS standard parts shall be used wherever they are suitable for the purpose, and shall be identified by their part numbers. Commercial utility parts such as screws, bolts, nuts, washers, cotter pins, etc., may be used provided they have suitable properties and are replaceable by the AN or MS standard parts without alteration, and provided the corresponding AN or MS numbers are referenced on the drawings and in the parts lists. In applications for which no suitable corresponding AN or MS part is in effect on date of invitation for bids, commercial parts may be used provided they conform to all requirements of this specification.

3.3.1 Gaskets. Gaskets shall be formed from pure gum, synthetic or any rubber gasket material that will provide and maintain a seal meeting the requirements of this specification.

3.4 Design and construction. The case and shock mitigating system shall provide protection against shock and environmental conditions encountered during storage and shipment.

3.4.1 Case styles. The case shall be of the dimensions specified (see 6.2) and shall facilitate positioning and fastening the case sections together to provide a tight-fitting protective case.

3.4.1.1 Transit case (Style 1). The transit case (see Fig. 1) shall consist of a traditional "clam shell" mold with two handles or lifting rings. One valise handle permitted for under 35 pound (16 kilograms) loads. (See 3.4.5) This style is normally equipped with cut or molded foam cushions for shock and vibration protection to the packaged item (see 3.8).

3.4.1.2 Combination case (Style 2). The combination case (see Fig. 2) shall consist of an overall design similar to a transit case, but with an inner flange on the closure to permit direct mounting of the item to the case. The combination case may be used for both shipment (of rugged items) and storage, and for operating the product while in the case. The case essentially becomes part of the item and does not normally include cushioning.

3.4.1.3 Console case (Style 3). The console case (see Fig. 3) shall consist of a case shell with either one or two covers (see 6.2) and lifting handles or rings. The shell center shall include a frame suitable for mounting standard rack-mountable instruments such that the instrument(s) may be operated in the case by removing the cover(s). The frame shall be shock isolated, if required (see 3.8).

3.4.1.4 Special designs (Style 4). Combinations or variations of the above case styles are permitted provided they meet the requirements of this specification and are approved by the procuring activity (see Fig. 4).

3.4.2 Closure. The case shall be so designed that structural loads shall not be transmitted to the closure gasket; it shall also be designed so that compression of the closure gasket shall not exceed the compression required for sealing. The closure shall form a natural water shed joint when the case is closed and in a normal upright position. The part of the closure containing the gasket shall be so designed to mechanically hold the gasket firmly in place to minimize set or abrading of the gasket. When the closure is fabricated separate from the case shell, it shall be permanently fastened to and become an integral part of the shell. The bond where the closure is secured to the shell shall be capable of meeting the same requirements as the material used for the case shell. Adhesive used in the process of fastening the closure to cases made of non-metallic materials, shall not deteriorate with aging and environmental conditions.

3.4.3 Hinges. Hinges used shall be designed of metal with corrosion resistant properties and be capable of withstanding the tests specified. The hinges shall be securely fastened to the case such that no racking shall occur during rough handling tests. Sliding (removable) hinges shall be designed such that the case cover may be easily removed, if desired, without tools by shifting the cover, yet retain proper alignment of the cover for closure.

3.4.4 Clasps. The clasps shall be over-centered type, metal tension clasps with corrosion resistant properties and be capable of withstanding the tests specified herein. The clasps shall be of adequate quantity and spacing to accurately draw the case sections together and securely hold them in a closed position. They shall prevent any separation of the closure or unlocking of the clasps when the case is subjected to the tests of Section 4. The clasps shall be protected from damage by contact with other objects or be able to withstand direct impacts of the specified rough handling tests without malfunction. They shall not interfere with cover removal when unlatched. Provision shall be made for only one orientation of the cover when necessary to insure proper alignment of internal cushion systems to the packaged item. Each clasp shall have provision for a tamper-proof seal that may be affixed after closure in such a manner that the clasps cannot be released without destroying the seal. The manufacturer is not required to furnish the seal. Provision shall also be made to permit field replacement of worn or damaged clasps with the use of simple hand tools without destroying the water-vaporproof seal. Other types of clasps may be specified (see 6.2) as long as all other test requirements are met.

3.4.5 Handles, class A cases. Unless otherwise specified, (see 6.2), a minimum of two folding metal handles shall be provided for lifting and carrying gross loads over 35 pounds (16 kilograms). The handles shall be a chest type designed for surface mounting with stops to hold the bail at right angle to the mounting plate when in carrying position and spring loaded to fold the bail into a down position when released. The bail of the handles shall have an inside length not less than 4 1/2 inches (11.4 centimeters) with a minimum clearance of 1 7/8 inches (4.8 centimeters) between the bail grip and the mounting plate. The handles and handle mounts shall be capable of passing the test of 4.5.3.6 without deformation or failure or damage to the case. The number and location of handles for each case (when loaded) shall be such that the load distribution per handle shall not exceed 45 pounds (22 kilograms) and shall be as evenly distributed as practicable for easy handling. Handles shall be installed sufficiently above the center of gravity of the equipment to insure carrying stability. Unless otherwise specified (see 6.2), a single non-springloaded handle (valise type) shall be provided for lifting and carrying gross loads of 35 pounds (16 kilograms) or less and attached to one of the long sides of the bottom section of the case at the center of balance, when the case is loaded.

3.4.6 Lifting rings, class B cases. Unless otherwise specified, (see 6.2), a minimum of two lifting rings or eyes shall be installed on the top section of each case. The lifting rings or eyes shall not interfere with stacking. The rings or eyes shall be located on the case to insure lifting stability (see Fig. 5). The lifting rings or eyes shall be designed for surface mounting and shall support a minimum load of 350 pounds (160 kilograms) each. Each ring or eye shall be capable of receiving a two inch (five centimeters) standard handling hook. Each lifting ring or eye shall be capable of passing the test of 4.5.3.6 without deformation or failure or damage to the case.

3.4.7 Stacking provisions. Provisions shall be provided on the top and bottom of the case for stacking and nesting. The provisions shall insure a stable stacking configuration with a minimum of movement in any direction.

3.4.8 Vacuum and pressure relief valve. Each case shall be provided with a simple, manually operated valve to equalize the air pressure inside the case to that of the outside air. The valve shall be designed, positioned, and protected on the case in such a way as to prevent damage and accidental opening. The design shall provide for a wire and tamperproof seal that may be affixed, after closing, in such a manner that the valve cannot be opened without destroying the seal. The valve assembly shall be replaceable; but not removable without the use of tools.

3.4.9 Automatic vacuum-pressure relief valve. When specified in the contract or order (see 6.2), each case shall be provided with an automatic relief valve to relieve internal or external pressures. The valve shall be manufactured from corrosion resistant materials and designed with a flow rate sufficient to protect the container against damage when subjected to differential pressures incurred during a rate of altitude ascent or descent of 2000 feet (610 meters). For cases less than 10,000 cubic inches (0.16 cubic meters), the valve shall be designed to maintain within the container a differential pressure between plus 2.50, $\pm$ 0.25 psi (175 $\pm$ 18 grams per square centimeter) or minus 0.50 $\pm$ 0.25 psi (35 $\pm$ 18 grams per square centimeter) gauge. For cases over 10,000 cubic inches (0.16 cubic meters) the valve rating shall not exceed the test pressure as given in Table II. When the automatic valve is used, it shall be in addition to the manually operated valve specified in 3.4.8, unless such features are built into the automatic valve.

3.4.10 Relative humidity indicator. When specified (see 6.2), each case shall be provided with facilities to accommodate a humidity indicator meeting the requirements of MIL-I-26860. The facility shall be designed in such a manner that no part of the facility will protrude beyond the fastening or handling devices. When specified by the contract or order (see 6.2), each case shall be furnished with a humidity indicator meeting the requirements of MIL-I-26860. When humidity indicators are not furnished, the facilities provided for these indicators shall be fitted with a threaded protector.

3.4.11 Attachment of fittings. All fittings, such as metal closures, clasps, and handles shall be self-draining and so attached to the case that there will be no ingress of moisture.

3.4.12 Size and weight. Cases shall be of the sizes specified by the procuring activity (see 6.2). Internal design and fabrication dimensions shall be measured between opposite points of tangency of the inscribed corner arcs. For cases less than 10,000 cubic inches (0.16 cubic meters), the tolerance of the plane lines shall be $\pm$ 1/32 inch ($\pm$ 0.8 millimeter) for the length and width and $\pm$ 1/16 inch ($\pm$ 1.6 millimeter) for the depth. For cases above 10,000 cubic inches (0.16 cubic meters), the tolerances of the plane line dimensions shall be $\pm$ 1/16 inches ($\pm$ 1.6 millimeters) for length, width and depth. Maximum weight of the cases shall be as shown in Table II.

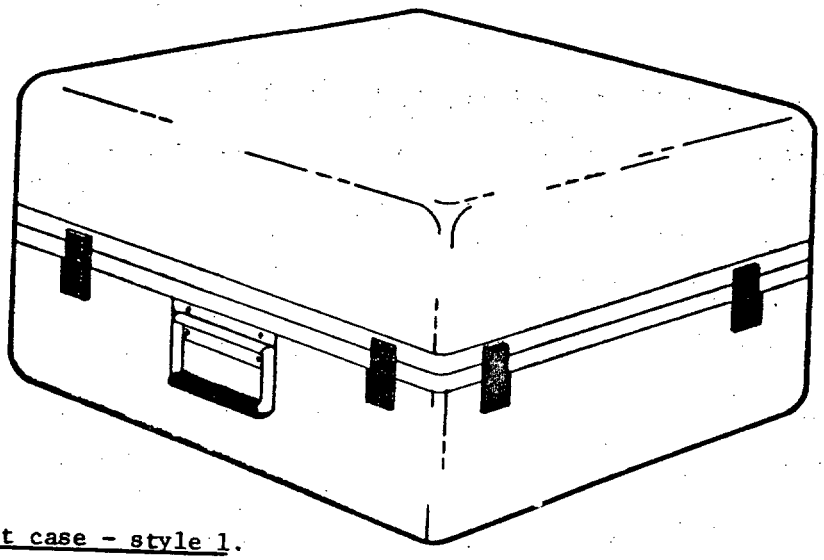


FIGURE 1. Transit case - style 1.

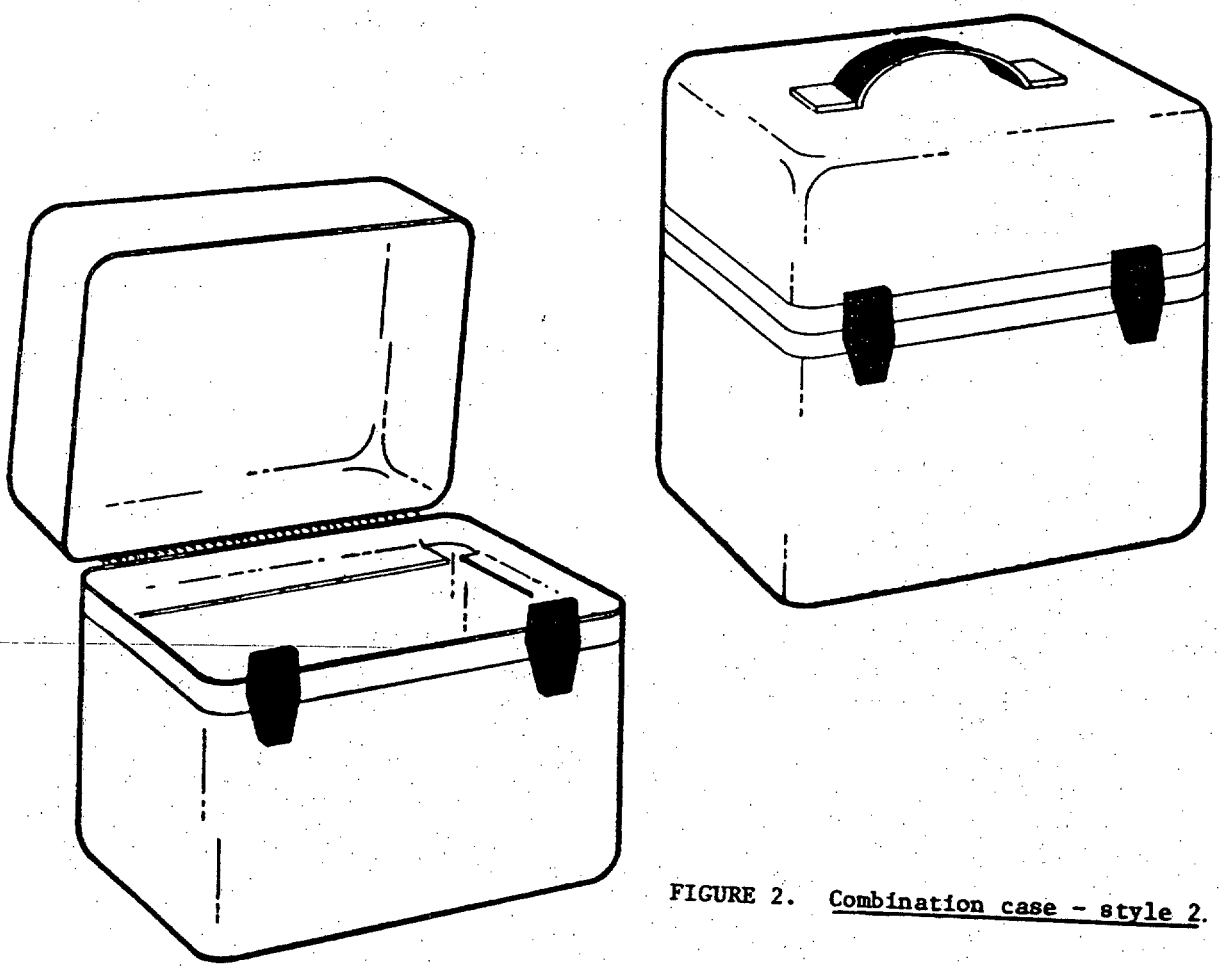


FIGURE 2. Combination case - style 2.

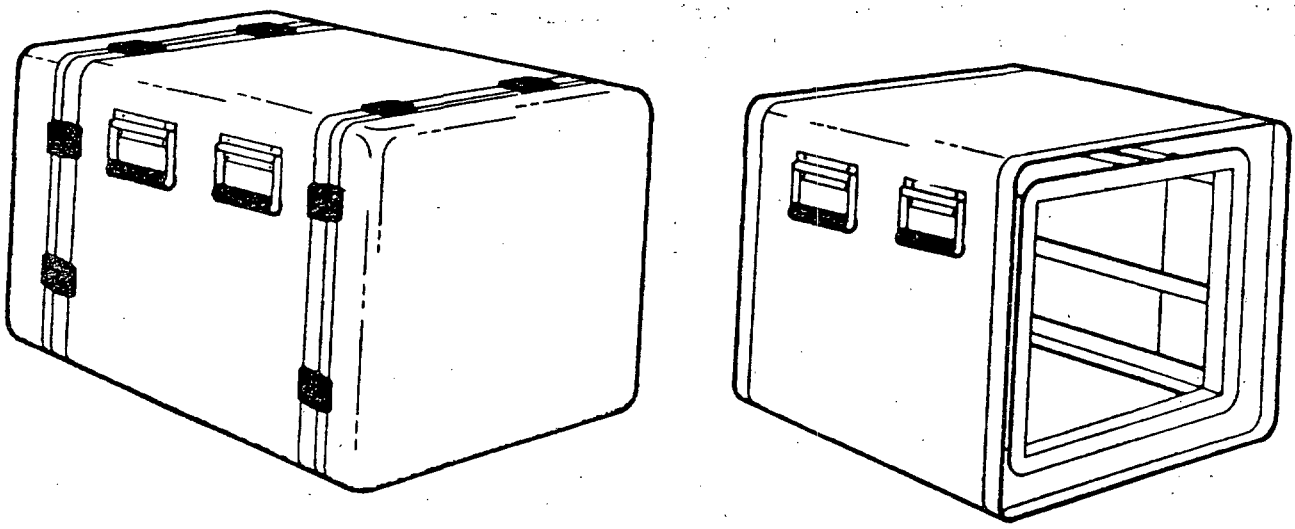


FIGURE 3. Console case - style 3.

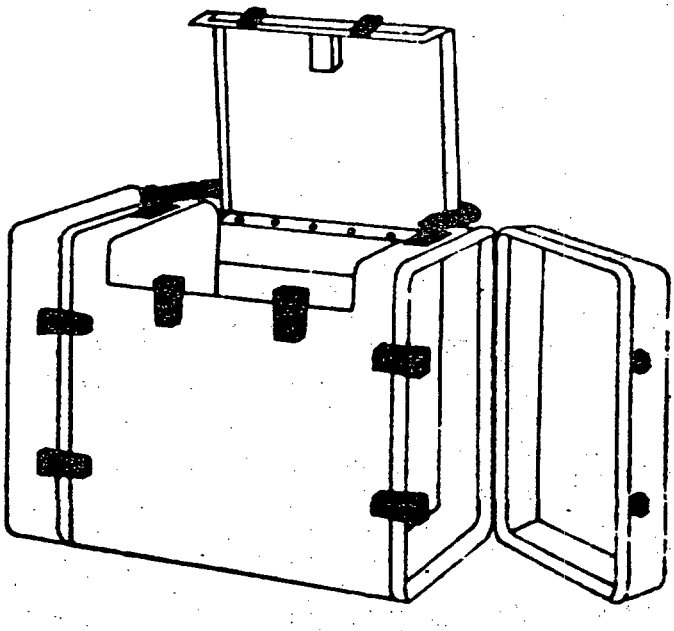


FIGURE 4. Special design - style 4.

3.5 Performance.

3.5.1 Opening and closure. The loaded case shall be capable of repeated opening and closing without the aid of tools or implements and without any degradation of the reuseability of the case.

3.5.2 Leakage. There shall be no evidence of leakage when the cases are subjected to the leak test of 4.5.3.1.

3.5.3 Concentrated load. Each case shall be capable of supporting the superimposed weight of a number of like cases having the maximum allowable tare weight and containing the applicable test load of Table II that simulates a minimum stacking height of 16 feet (5 meters) (see 4.5.3.2).

3.5.4 Drop test. Each case shall be capable of withstanding the drop test of 4.5.3.3 when loaded with the applicable maximum test load of Table II without any damage which would impair the functioning of the case.

3.5.5 Temperature. The case shall be capable of withstanding prolonged storage and use at temperatures of minus 65 to plus 160 degrees F (minus 54 to plus 71 degrees C) (see 4.5.3.4).

3.5.6 Humidity. The case shall be capable of withstanding exposure at 95 percent relative humidity and 120 degrees F (49 degrees C) without any degradation which would impair the functioning of the case (see 4.5.3.5).

3.5.7 Interchangeability. All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The drawing and part number requirements of MIL-D-1000 shall govern assignments and changes in the manufacturer's part numbers. Matching sections of each case shall be numbered so as to aid in matching sections.

3.6 Color. Unless otherwise specified (see 6.2), a color between numbers 15044 and 15080 of Federal Standard 595 shall be used for cases procured under this specification.

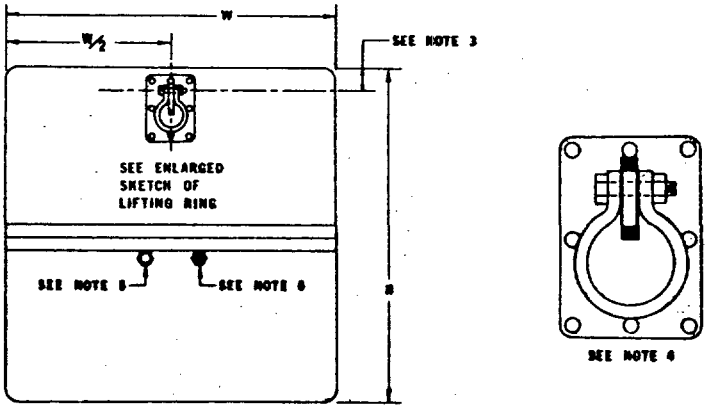
3.7 Finish. All exterior and interior surfaces shall have a corrosion and abrasive resistant finish in accordance with requirements specified herein. In addition, the non-ferrous metal case shells shall be prime coated with a wash primer conforming to MIL-P-15328 or with a zinc-chromate primer conforming to TT-P-1757. Unless otherwise specified (see 6.2), the case shall be painted with enamel conforming to TT-E-489, class B. Non-metallic cases having the color pigmentation compounded in the material shall not require painting.

3.8 Cushioning and mounting provisions. Cushioning or shock and vibration mounting or suspension system requirements for cases furnished under this specification shall be as specified in the contract or order or when specified, shall be developed and provided by the contractor (see 6.2).

3.9 Marking. If required (see 6.2) the following marking shall be molded or stamped into the exterior surface of the case, in the location specified, in sunken letters approximately 5/8 inch (1.6 centimeters) high.

3.9.1 Nameplate. If required (see 6.2) a name plate shall be molded, stamped, or otherwise permanently attached to the exterior surface of the case, in the location specified. The nameplate shall include the following data:

CASE, TRANSIT & STORAGE, WATER-VAPORPROOF
STOCK NUMBER
SPECIFICATION NUMBER
INSIDE DIMENSION (L x W x H)
MFG'S PART NUMBER



END VIEW OF STYLE I, CLASS B CASE WITH 2 LIFTING RINGS

NOTES

1. Dimensions W and H are applicable to the width and height of case respectively. Where more than two lifting rings are used, they shall be located symmetrically about the case to insure lifting stability.

2. Tolerance for lifting ring location is ± 1/4 inch (± 0.6 centimeter).

3. Lifting rings will be installed as high as practicable on the top section of the case without interfering with stacking requirements as outlined in paragraph 3.4.7.

4. Lifting rings may be of any design that permits the ring to fold down flat against the mounting plate and meet the requirements 3.4.6.

5. Provisions, when specified, for humidity indicator (see 3.4.10) will be located approximatley as shown on the side or end of the case containing the lifting rings.

6. Vacuum -- pressure relief valve will be installed adjacent to the provisions for the humidity indicator provisions. For valve requirements see paragraphs 3.4.8 and 3.4.9.

LOCATION OF LIFTING RINGS, VACUUM--PRESSURE RELIEF VALVE AND PROVISIONS FOR HUMIDITY INDICATOR

FIGURE 5

TABLE II

Case Volume (Cubic inches)	Case Volume (Cubic meters)	Case Max. Weight (Tare) (Pounds)	Case Max. Weight (Tare) (Kilograms)	Test Load (Net) (Pounds)	Test Load (Net) (Kilograms)	Test Pressure Gauge (psig)	Test Pressure Gauge (Grams/square centimeters)
1,000 - 1,500	.016 - .025	10	4.5	20	9.1	4	281.2
1,501 - 2,000	.025 - .033	15	6.8	30	13.6	4	281.2
2,001 - 3,000	.033 - .049	25	12.7	50	22.6	4	281.2
3,001 - 6,000	.049 - .098	35	15.9	70	31.8	3	210.9
6,001 - 10,000	.098 - .164	45	20.4	90	40.8	3	210.9
10,001 - 15,000	.164 - .246	65	29.5	130	59.0	2	140.6
15,001 - 20,000	.246 - .328	78	35.4	156	70.8	2	140.6
20,001 - 25,000	.328 - .410	85	38.6	170	77.1	1.5	105.5
25,001 - 30,000	.410 - .492	95	43.1	190	86.2	1.5	105.5
30,001 - 35,000	.492 - .574	105	47.6	210	95.3	1	70.3
35,001 - 40,000	.574 - .655	115	52.2	230	104.3	1	70.3

3.9.2 Manufacturer's part number. The part number marked in the space provided on the nameplate shall be in accordance with MIL-STD-130.

3.9.3 Additional marking. Unless otherwise specified (see 6.2), cases designed for specific items or pieces of equipment shall be marked with a listing identifying the contents on each end of the case in such a manner that the marking data is permanently legible.

3.9.4 Cushioning marking. When a cushioning system is furnished as part of the order or contract, it shall be permanently and legibly identified by molding or identification plates with the following information:

Part number of cushion system
Applicable designation for top or bottom pad
Assembly identification, including complete information as to the item or equipment for which the cushioning is designed

3.10 Workmanship. The case, including all parts, shall be of clean design, well made and free from any defects which may affect durability, strength or serviceability. All exposed edges of reinforced plastic or other non-metallic materials resulting from machining, drilling, etc., shall be permanently sealed with a coating of the resin used in fabrication of the parts.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

1. First article inspection (see 4.3)
2. Quality conformance inspection (see 4.4)

4.3 First article inspection.

4.3.1 First article test samples. First article tests shall be performed on one case of each type, style and class representative of the cases to be supplied under the contract. Test shall be performed at the contractor's plant under the responsibility of contractor and in accordance with the approved test procedures of 4.5. The contractor shall inform the procuring activity when tests are to be performed so that a representative may be designated to witness and monitor the tests, when so desired. After completion of the

tests performed at the contractor's plant, the procuring activity may request the shipment of the cases tested to a Government facility for further testing. The data obtained by the contractor in performing tests shall be submitted to the procuring activity at the completion of all tests and prior to shipping the equipment to the Government testing facility. Contractors not having adequate facilities to perform all required tests shall obtain the services of a commercial testing laboratory satisfactory to the procuring activity. Samples shall be appropriately identified with the manufacturer's part number and any additional information required by the procuring activity. Unless otherwise specified, the case selected for first article testing shall be the largest case within a given type, style, and class for which procurement is being effected. Cases exceeding the volume of the largest case listed in Table II shall be tested and subject to approval by the procuring activity before production is commenced. Written certification of compliance with first article tests may be acceptable in lieu of testing where the contractor submits evidence of having successfully passed first article tests, provided the cases or materials have not been changed or modified in any manner.

4.3.2 Test reports and technical data. Unless otherwise specified (see 6.2), the manufacturer shall furnish the procuring activity with two copies of the case assembly drawings and technical data 15 days prior to date of first article tests. The manufacturer shall furnish the procuring activity with documented evidence that the requirements for materials specified in 3.2 have been met.

4.3.3 Tests. The first article tests shall consist of all the tests specified under 4.5.

4.4 Quality conformance inspection.

4.4.1 Size of lot. For the purpose of sampling, a lot shall consist of all cases of the same type, style, class and size manufactured under essentially the same conditions and offered for delivery at one time.

4.4.2 Sampling for examination and test. A random sample of cases from each lot shall be selected in accordance with MIL-STD-105, inspection level S-4.

4.4.2.1 Sample for properties non-metallic materials. One case manufactured from non-metallic materials shall be selected at random from each lot and shall be cut into test panels for testing in accordance with 4.5.2. This case may be a reject providing the defect does not affect the results of the tests as required in 4.5. Where lot size is less than 500 cases, certified documentation that the requirements for non-metallic materials specified in 3.2 have been met may be acceptable in lieu of testing.

4.4.2.2 Sample for performance tests. One case shall be selected at random from each sample for testing in accordance with 4.4.5.

4.4.3 Examination of product. Each sample shall be carefully examined to determine conformance to this specification with respect to material, workmanship and requirements for which no tests are specified (see Table III).

4.4.4 Classification of defects. An Acceptable Quality Level (AQL) of 1.5 is established for major defects and an AQL of 4.0 is established for minor defects.

TABLE III

CATEGORIES	DEFECTS
Major:	
101	Cases not conforming to type, style or size as specified in contract or order.
102	Top and bottom of case not matched.
103	Closure joint permits superimposed load to compress gasket excessively.
104	Closure joint does not shed water when case is in upright position.
105	Clasps not as required.
106	Rough spots in the case shell that would impair the serviceability.
107	Lifting rings or handles not installed on cases as specified.
108	Stacking devices not provided.
109	Provisions for humidity indicator not installed when required.
110	Vacuum-pressure relief valve not provided.
111	Bolts, rivets, etc., used in attached fittings left with sharp ends and spurs protruding beyond the surfaces of the case.
112	Welded seams rough and uneven and subject to develop leaks while in use.
113	Gaskets not proper size, does not fit.
114	Specified number of handles not provided.
115	Fittings, clasps, etc., not plated or protected as required.
116	Cases not properly identified.

CATEGORIES	DEFECTS
Minor:	
201	Handles smaller than specified.
202	Handles not spring loaded (when required)
203	Color not as specified in contract or order.
204	Cushioning (when furnished) not identified.
205	Suspension systems (when furnished) not marked as specified.

4.4.5 Quality conformance tests. The quality conformance tests shall consist of all the tests specified in 4.5 except: 4.5.2.5 fungus resistance test, 4.5.3.4 temperature test, and 4.5.3.5 humidity test.

4.5 Tests and test methods. Unless otherwise specified herein, all of the following test methods shall be in accordance with Federal Test Method Standard No. 101.

4.5.1 Preparation of test samples. All tests except the tests of 4.5.2 and 4.5.3.1 shall be conducted with the case fully assembled and loaded. The test load shall be a dummy test load in accordance with Table II.

4.5.2 Non-metallic materials test.

4.5.2.1 Water-vapor transmission rate of non-metallic materials (Type II only). This test shall be conducted in accordance with method 3030, procedure A, under the conditions of 100°F (38°C) temperature and 95 percent relative humidity for conformance to the requirements of 3.2.

4.5.2.2 Tensile strength of non-metallic materials. The tensile tests shall be conducted in accordance with method 2040 for conformance to the requirements of 3.2.2.1.

4.5.2.3 Compressive strength of non-metallic materials. The compressive strength tests shall be conducted in accordance with method 2012 for conformance to the requirements of 3.2.2.1.

4.5.2.4 Flexural strength of non-metallic materials. The flexural strength tests shall be conducted in accordance with method 2019 for conformance to the requirements of 3.2.2.1.

4.5.2.5 Fungus resistance. The fungus resistance test shall be conducted in accordance with method 3020 for complaince to the requirements of 3.2.4.

4.5.3 Performance tests.

4.5.3.1 Leak test. Either of the tests listed below may be used. The leak test shall be conducted before and after the drop tests of 4.5.3.3 for compliance with the requirements of 3.5.2.

4.5.3.1.1 Immersion. Inspection for leaks shall consist of immersing (for three minutes), the case without cushions or equipment, between 1 and 2 inches (3-5 centimeters) under water having a temperature of 160°F (71°C). All surfaces of the case shall be examined carefully for air bubbles which will indicate leakage during this test. Immediately after the case is removed from the immersion tank, a hot soap suds solution shall be poured over the case and a check made for air bubbles which could indicate a leak. Presence of air bubbles, other than the normal trapped air around the hardware, or presence of moisture inside the case shall constitute cause for rejection.

4.5.3.1.2 Pneumatic pressure test. This test shall be conducted in accordance with Method 5009, pneumatic pressure technique utilizing the applicable test pressure of Table II. The leak test shall be conducted before and after the drop tests of 4.5.3.3 for compliance with the requirements of 3.5.2. The same closure gasket shall be used in both series of leak tests.

4.5.3.2 Concentrated load test. The concentrated load test shall be conducted in accordance with method 5016 for conformance to the requirements of 3.5.3.

4.5.3.3 Drop test. The free-fall drop test shall be conducted in accordance with method 5007, procedure A for compliance with 3.5.4 except that the drop height be 48 inches (125 centimeters) (see 6.1.2).

4.5.3.4 Temperature test. The case shall be conditioned to each of the controlled temperatures in method 4007 and, while at that temperature, subjected to the free-fall drop test of method 5007, procedure D, for conformance to the requirements of 3.5.5.

4.5.3.5 Humidity test. The case shall be subjected to ten (10) cycles of moist heat-dry heat, accelerated weathering procedure of method 4007 for compliance with the requirements of 3.5.6.

4.5.3.6 Handling test. The sample case shall be lifted clear of the floor or ground and suspended by one handle, lifting hook or eye, as applicable, for a minimum of two (2) minutes. Each handle, lifting hook or eye, of the sample case shall be so tested for compliance with 3.4.5 and 3.4.6.

4.5.4 Packing and marking. A random sample of boxes from each shipment shall be selected for determining the compliance of packing and marking requirements for shipment.

5. PACKAGING

5.1 Preservation-packaging. Not applicable.

5.2 Packing. Packing shall be level A or C as specified (see 6.2).

5.2.1 Level A. When specified (see 6.2), each carrying case shall be packed individually in a fiberboard container conforming to PPP-B-636, class weather-resistant. Grade W5 or W6 may be used for cases up to specification limits for normal requirements, type 1 load. Cases exceeding these requirements shall be packed in grade V3 containers. In lieu of the closure and water-proofing requirements in the appendix of PPP-B-636, closures and water-proofing shall be accomplished by sealing all seams, corners and manu-facturers joint with water-resistant tape, 2 inch (5 centimeters) width, conforming to PPP-T-76. Banding shall be applied in accordance with the appendix Table V of PPP-B-636 stipulating use of non-metallic banding only.

5.2.2 Level C. When specified (see 6.2), cases shall be individually packed in a manner which will afford adequate protection against damage from the supply source to the first receiving activity for immediate use. Containers and packing shall comply with the Uniform Freight Classification Rules and National Motor Freight Classification Rules, as applicable.

5.3 Marking. In addition to any special marking required by the contract or order, shipping containers shall be marked in accordance with the requirements of MIL-STD-129.

6. NOTES

6.1 Intended use. These cases are intended for use as shipping and storage containers for items of military equipment and supplies requiring moisture and water-vaporproof protection. These cases are also intended for use when homogeneous molded or die-cut cushioning or shock mounting suspension systems are specified in the contract or order for specific requirements.

6.1.1 Cross references. Containers meeting the requirements of this specification generally meet or exceed the container requirements of the following specifications:

MIL-T-21200
MIL-T-28800 (styles A, C, G, and H)
RDD-STD-2 (ARMY)

6.1.2 Drop test requirement note (see 4.5.3.3). The 48-inch (122 centimeters) drop test specified in 4.5.3.3 is intended to determine the impact strength and overall structural properties of the container, not to determine the ability of the cushioning to protect a specific product inside the case. Testing of the enclosed product should be as specified in 3.8 (specified in the contract), which would normally be tested in accordance with MIL-P-116 or the provisions of Federal Test Method Standard 101b, method 5007.

6.2 Ordering data. Invitation for bids, contracts, and purchase orders should state the following:

(a) Title, number, and date of this specification.

(b) Type, style, and class and variety of case (see 1.2).

(c) Inside dimensions of case (see 3.4.12).

(d) Handle requirements if different from 3.4.5.

(e) Lifting rings or eyes requirement if different from 3.4.6.

(f) Automatic pressure-vacuum relief valve requirement (see 3.4.9).

(g) Humidity indicator facility and plug requirements (see 3.4.10).

(h) Cushioning or shock mount provision requirements (see 3.8 and 3.9.4).

(i) Additional identification marking if required and desired location (see 3.9).

(j) Level of packing desired (see 5.2).

(k) Nameplate, if required, and location (see 3.9.1).

(l) Color and finish if different from 3.6 and 3.7.

(m) Test reports and technical data requirements (see 4.3.2).

(n) Special marking on shipping containers (see 5.3).

(o) Specify type of clasp if other than 3.4.4.

(p) For style 3, specify one or two covers (see 3.4.1.3).

(q) When a first article is required for inspection and approval (see 3.1 and 4.3.1).

6.3 Supersession data. Type II cases procured under this specification may be used to replace cases procured under previous issues of this specification. This specification includes the requirements of MIL-B-25305A, 13 March 1962.

Custodians:
Army - GL
Navy - AS
Air Force - 69

User activities:
Army - ME
Navy - MC, SA, MC
Air Force - 99

Review activities:
Army - EA, SM, MI, EL
Navy - OS, AS
Air Force - 11, 13, 18, 99

Preparing activity:
Air Force - 69
Project 8115 - 0405

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