

INCH-POUND

MIL-C-4976C (USAF)

31 January 1989

SUPERSEDING

MIL-C-4976B (USAF)

22 APRIL 1982

MILITARY SPECIFICATION**CABINET, DRYING, PARACHUTE, TYPE MA-1**

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

1. **SCOPE.**

1.1 **Scope.** This specification covers one type of parachute drying cabinet, designated type MA-1.

2. **APPLICABLE DOCUMENTS.**2.1 **Government documents.**

2.1.1 **Specifications and standards.** The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS**MILITARY**

| | |
|------------|---|
| MIL-C-104 | Crates, Wood, Lumber and Plywood, Sheathed, Nailed and Bolted |
| MIL-P-116 | Preservation, Methods of |
| MIL-H-4607 | Heater, Engine and Shelter, Ground, Type H-1 |
| MIL-C-5541 | Chemical Films for Aluminum and Aluminum Alloys |
| MIL-C-5756 | Cable and Wire, Power, Electric, Portable |
| MIL-H-7365 | Hose, Air Duct, for Ground Heaters |
| MIL-A-8625 | Anodic Coatings, for Aluminum and Aluminum Alloys |

STANDARDS**Federal**

FED-STD-595 Colors

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: WR-ALC/MMIRFW, Robins AFB, GA 31098-5609 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4440

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MILITARY

| | |
|-------------|---|
| MIL-STD-129 | Marking for Shipment and Storage |
| MIL-STD-130 | Identification Marking of U.S. Military Property |
| MIL-STD-143 | Specifications and Standards; Order of Precedence for the Selection of |
| MIL-STD-831 | Test reports, Preparation of |
| MIL-STD-882 | System Safety Program, for Systems and Associated Subsystems and Equip- ment: Requirements for |
| MS 24380 | Casters, Industrial |

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

2.2 Non-Government publications. The following document(s) form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

Consolidated Freight Classification Committee Publications

Consolidated Freight Classification Ratings, Rules, and Regulations

(Copies of Consolidated Freight Classification Ratings, Rules, and Regulations may be obtained from the Consolidated Freight Classification Committee, 202 Chicago Union Station, Chicago, Illinois 60606.)

American Trucking Association

National Motor Freight Classification Rules and Container Regulations

(Copies of National Motor Freight Classification Rules and Container Regulations may be obtained from the National Classification Board, 1424 Sixteenth Street, N.W., Washington D.C. 20036.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS.

3.1 Preproduction. This specification makes provisions for preproduction testing.

3.2 Components. The cabinet shall consist of the following major components:

| NOMENCLATURE | SEE REQUIREMENT |
|----------------------------|-----------------|
| Main Drying Cabinet | 3.8 |
| Drying Racks | 3.9 |
| Loading Ramp or Ramps | 3.10 |
| Skid Base | 3.11 |
| Temperature Indicator | 3.12 |
| Temperature Warning Signal | 3.13 |

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3.3 Selection of specifications and standards. Specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-143 except as specified in 3.3.1 and 3.3.2.

3.3.1 Commercial parts. Commercial parts having suitable properties may be used where, on the date of invitation for bids, there are not suitable standard parts. In any case, commercial utility parts, such as screws, bolts, nuts, and cotter pins, having suitable properties may be used provided:

- a. They can be replaced by the standard parts (MS or AN) without alteration.
- b. The corresponding standard part numbers are referenced in the parts list.

3.3.2 Standard parts. With the exception specified in 3.3.1, MS and AN standard parts shall be used where they suit the purpose.

3.4 Materials. Materials shall be as specified herein. Materials not definitely specified shall be of the best quality used in the purpose of commercial practice. Materials used in the cabinet shall in no way have a detrimental effect on the strength or life of the parachute.

3.5 Protective treatment. When materials are used in the construction of the cabinet that are subject to deterioration when exposed to climatic and 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 extremes of climatic and environmental conditions shall be avoided.

3.6 Design and construction. The cabinet shall be designed and constructed so that no parts will work loose in service. It shall be designed and constructed in such a manner that it can be erected in the field by means of standard hoists and tools and without the use of special apparatus or appliances. It shall be built to withstand the strains, jars, vibrations, and other conditions incident to shipping, storage, installation and service. The cabinet shall be substantially in accordance with figure 1.

3.6.1 Assembly and disassembly. The cabinet shall be designed for five assemblies and four disassemblies during its life expectancy. It shall be constructed so that it can be disassembled or assembled by two men in a maximum of two hours.

3.6.2 Lifting provisions. The cabinet shall be constructed so that, when assembled, it may be lifted by means of a hoist, crane, or other device. Four lifting eyes shall be located on the top section and in the four corners equally spaced from the geometric center of the cabinet. The inside diameter of the eyes shall be a minimum of 2-1/2 inches and a maximum of 3 inches.

3.6.3 Safety. The equipment furnished under this specification shall be analyzed for category I and category II hazards as defined in MIL-STD-882. Any hazard so identified shall be brought to the attention of the procuring agency, with recommended action for satisfying safety requirements. Action order of precedence shall be as specified in MIL-STD-882, paragraph 5.4.2.

3.7 Performance.

3.7.1 Drying capabilities. The main drying cabinet and racks shall be capable of accommodating two 44-foot-diameter deceleration parachutes, each weighing approximately 200 pounds wet and having a packed volume of seven cubic feet. The cabinet shall be capable of drying both deceleration parachutes, using one heater, to a maximum of two percent by weight in moisture content within three hours at an ambient temperature of 70 °F and a mean relative humidity of 50 percent.

3.8 Main drying cabinet. The cabinet shall have a minimum inside dimension of 70 inches in height, 70

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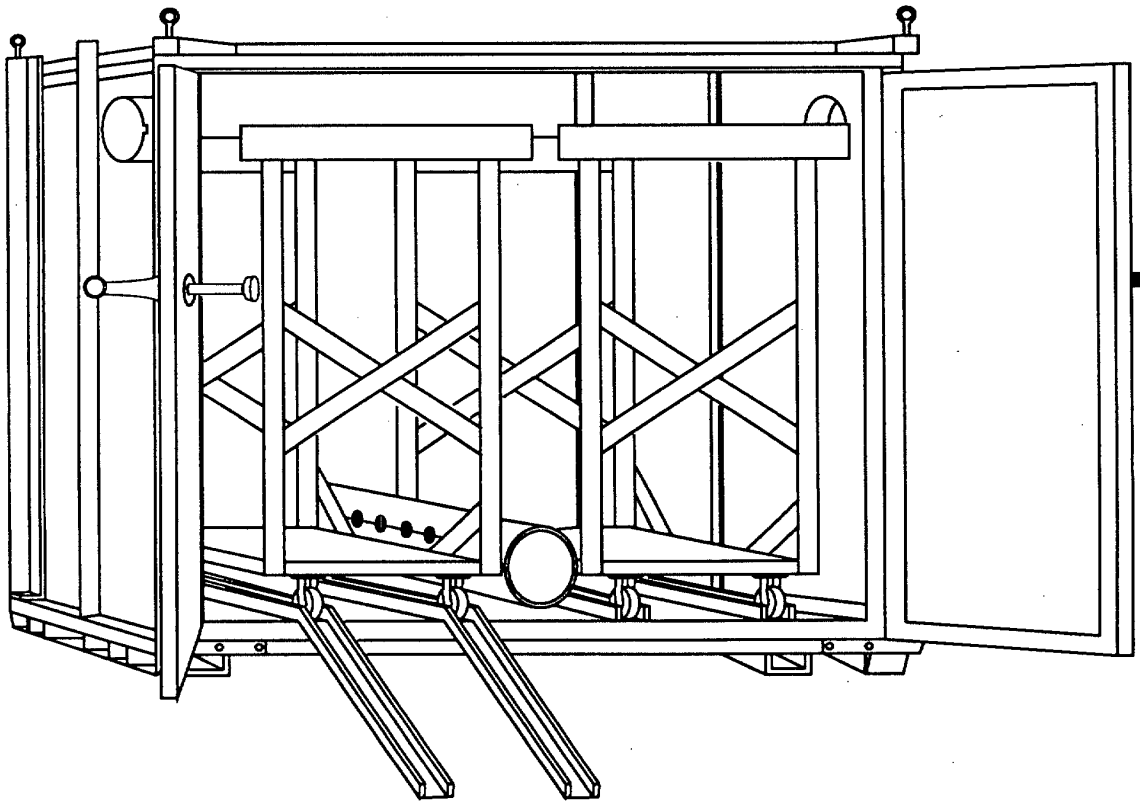


Figure 1. Parachute Drying Cabinet, Portable

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inches in width, and 94 inches in length. Each wall, roof, and floor unit shall be sectionalized so as to be easily assembled, disassembled, and air transported. Each section shall be assembled or disassembled by two men. The cabinet shall be so constructed that water will not collect on the cabinet.

3.8.1 **Heating ducts.** One 12 inch male heater inlet duct fitting conforming to MIL-H-7365 shall be located in the rear panel to allow connection of a heat source similar to the Type H-1 heater conforming to MIL-H-4607. Two 12 inch female outlet duct fittings conforming to MIL-H-7365 shall be provided. One fitting shall be located on each side of the cabinet. The inlet and outlet ducts shall be so located as to provide the most efficient flow of hot air through the parachutes for the maximum absorption of moisture. A cover shall be provided for each duct. The covers shall be attached to the cabinet by flexible chain or cable, or hinged to the duct or cabinet.

3.8.2 **Inside finish.** The inside of the cabinet shall have no sharp edges or protrusions that might snag, foul, or damage a parachute. This shall apply to all surfaces of the dryer that will come in contact with the parachutes in normal operation.

3.8.3 **Doors.** The cabinet shall have double doors that will permit easy entry and withdrawal of the drying racks. Actual dimensions of the doors shall be determined by the largest rack that can be utilized with the cabinet. The doors shall open from both inside and outside the cabinet and shall be equipped with refrigerator door hardware of a recognized manufacturer. When closed, the doors shall be sealed to prevent heat loss.

3.8.4 **Water drain.** The cabinet shall have a centrally located water drain. The outlet of the drain shall be a rigid tube extending to an accessible point beyond the outside dimensions of the cabinet.

3.8.5 **Seals.** When assembled and with the doors closed, the cabinet shall be sealed to prevent heat losses. The seals shall be suitable for use in temperatures ranging from -65° to +200°F.

3.8.6 **Insulation.** The cabinet shall be insulated so that when the inside temperature is 180°F, the outside surface temperature will not exceed 100°F with an ambient temperature of 72°F.

3.8.7 **Stops.** Stops shall be provided to prevent the racks from damaging the rear panel and removable stops shall be provided to hold the racks in position during the drying operation. Door stops shall be provided to prevent damage to the side panels and doors.

3.9 **Drying racks.** Two drying racks shall be provided to hold the parachutes during the drying process. The drying racks shall be collapsible for ease of transportability and for quick assembly or disassembly. They shall be designed to interlock side-by-side and so that a parachute can be draped in accordin folds. The drying racks shall have no sharp edges or protrusions that might snag, foul, or damage a parachute. Four casters, two conforming to MS 24380-4RU and two conforming to MS 24380-4SU, shall be provided with each rack to permit easy entry and withdrawal from the cabinet.

3.10 **Loading ramp.** A loading ramp shall be provided that will allow the racks to be easily rolled into the cabinet and installed individually and interlocked side by side. The ramp shall be stored in the cabinet when not in use.

3.11 **Skid base.** The cabinet shall be supported on a skid base which shall be an integral part of the cabinet. The skid-mounted base shall be constructed to evenly support the unit. The skids shall be beveled on both sides to protect the cabinet from damage when skidded over concrete, gravel, frozen ground, snow, or ice. The bottom of the cabinet base shall be suitably reinforced to withstand rough handling over such surfaces.

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3.11.1 Forklift slots. Two forklift slots shall be installed on the bottom of the cabinet each having minimum dimensions of 4 inches high and 12 inches wide. The slots shall be located 36 inches between centers and equally spaced on either side of the center of gravity location of the cabinet.

3.12 Temperature indicator. The cabinet shall be provided with a dial-type temperature indicator which shall have a range of operation from a maximum of 250° F to a minimum of 100° F and shall indicate within $\pm 5^\circ$ F the approximate average air temperature surrounding the parachutes. The dial of the indicator shall be not less than 5 inches in diameter and shall be located on the external surface of the cabinet in such a position that it will be readily visible to the attendant in charge of the heater.

3.13 Temperature warning signal. A warning bell system shall be installed on the cabinet which shall sound an audible alarm when a temperature in excess of 200° F surrounding the parachute is encountered. The alarm shall be heard for a radial distance of 50 feet while the drying process is in operation. The system shall operate from 115 VAC and shall be provided with a 30-foot lead-in cable. The cable shall be resistant to fuels and lubricants and shall withstand low temperature in accordance with MIL-C-5756.

3.14 Interchangeability. All parts having the same manufacturer part number shall be functionally and dimensionally interchangeable.

3.15 Finishes and protective coatings.

3.15.1 Aluminum-alloy parts. Aluminum-alloy parts shall be covered with an anodic film conforming to MIL-A-8625 except as follows:

- a. Dials, small holes, and case inserts shall be anodized.
- b. Aluminum alloys which do not anodize satisfactorily shall be coated with a chemical film in accordance with MIL-C-5541.
- c. Where the primary purpose of the treatment is to afford a suitable paint base, chemical treatments in accordance with MIL-C-5541 may be used in lieu of anodizing.

3.15.2 Castings. Castings containing nonaluminum alloy integral inserts may be treated with a chemical film in accordance with MIL-C-5541 in lieu of anodizing.

3.15.3 Abrasion. When abrasion resistance is a factor, chemical films in accordance with MIL-C-5541 shall not be used in lieu of anodizing.

3.15.4 Painting. All parts not chemically treated with a protective coating or plated shall be painted in accordance with FED-STD-595, color 13538.

3.16 Instruction plate. An instruction plate containing the following information shall be permanently attached near the temperature indicator. The height of the letters shall be 1 inch.

CONTROL CABINET TEMPERATURE BY REGULATION OF
HEATING UNIT OUTLET AIR TEMPERATURE CONTROL.

3.17 Identification of product. Equipment, assemblies, and parts shall be marked for identification in accordance with MIL-STD-130.

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3.18 Government-loaned property. When the contract or purchase order so provides, the Government will loan the following to the contractor upon his request to be used in designing, testing, and fabricating the cabinet (see 6.2):

| <u>Item No.</u> | <u>Part No.</u> | <u>Item Description</u> | <u>Quantity</u> |
|-----------------|-----------------|--|-----------------|
| 1 | 25-5864-5012 | Parachute, Aircraft Deceleration 43-1/2 foot Diameter | 2 |
| 2 | MIL-H-4607 | Heater, Type H-1, MIL-H-4607 | 1 |
| 3 | 50D24022 | Duct, Flexible | 1 |

3.19 Workmanship. The cabinet shall be fabricated and finished in a thoroughly workmanlike manner. Particular attention shall be given to freedom from blemishes, defects, burrs, sharp edges and accuracy of dimensions.

4. QUALITY ASSURANCE PROVISIONS.

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Classification of Tests. The inspection and testing of the cabinet shall be classified as follows:

- a. Acceptance tests See 4.3
- b. Preproduction testing See 4.5

4.3 Acceptance tests. The acceptance tests shall consist of the individual tests.

4.3.1 Individual tests. Each cabinet shall be subjected to an examination of product test as described under 4.4.1.

4.4 Test methods.

4.4.1 Examination of product. The cabinet shall be inspected to determine compliance with the requirements specified herein with respect to materials, workmanship, marking, dimensions, and use of approved drawings or specifications.

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4.4.2 Drying time test. Two completely wet, 44-foot diameter deceleration parachutes shall be placed on the drying racks within the cabinet after the heat source has reached the temperature required. With an ambient temperature of 70° F and a mean relative humidity of 50 percent, the cabinet shall dry the two parachutes within three hours. The parachutes shall be dry after testing to a maximum of two percent by weight of moisture content. Calculations shall be presented to correct for variations in ambient temperature or humidity, if necessary. The dry weight shall be established immediately upon removal of the parachute from its hermetically sealed container.

4.4.2.1 Temperature indicator test. The temperature indicator shall be checked to ensure that it indicates the temperature of the air surrounding the parachutes within $\pm 5^\circ$ F.

4.4.2.2 Insulation. The outside surface temperature of the cabinet shall be checked to ensure that the cabinet is insulated to meet the requirements 3.8.6.

4.4.3 Warning signal. The temperature warning signal shall be checked to ensure that it meets the requirement of 3.13.

4.4.4 Assembly and disassembly. The cabinet, disassembled in the manner that it would be shipped, shall be completely assembled by two men and ready for operation in two hours. The cabinet shall then be disassembled by two men within a period not to exceed two hours.

4.4.5 Skidding. The assembled cabinet shall be dragged over 1 inch square rods placed six feet apart on smooth concrete for 100 yards at a speed of two mph. Parts separated or loosened due to vibration shall be cause for rejection.

4.4.6 Static load. A 200 pound load shall be applied to a 12 inch square area in the middle of each panel section for five minutes. Evidence of cracking or permanent deformation of any panel shall be cause for rejection.

4.5 Preproduction testing.

4.5.1 Preproduction test sample tested by the contractor. The contractor shall be subject one cabinet to the preproduction tests specified in 4.5.3.

4.5.2 Preproduction test report. After the contractor completes the preproduction tests, he shall prepare a preproduction test report in accordance with MIL-STD-831 and furnish three complete copies of the report to the procuring activity (see 6.2).

4.5.3 Preproduction tests. The preproduction tests shall consist of all tests described under 4.4.

4.5.4 Examination for preparation of delivery. Inspection of the preservation, packaging, packing and marking for shipment and storage. Sample items or packs and the inspection of the preservation, packaging, packing and marking for shipment and storage shall be in accordance with the requirements of Section 5, or the documents specified therein.

5. PACKAGING.

5.1 Packaging. Packaging shall be Level A or B as specified (see 6.2).

5.1.1 Level A. The cabinet shall be disassembled to the extent considered practical for reassembly under field conditions and packaged in accordance with Method III of specification MIL-P-116. The unit quantity shall be one each.

5.2.2 Level B. The cabinet shall be packaged in accordance with the manufacturer's commercial practice.

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5.2 **Packing.** Packing shall be Level A or B (see 6.2).

5.2.1 **Level A.** Each cabinet packaged as specified in 5.5.1 shall be packed in a crate conforming to Type 1, Class 2, Style A of specification MIL-C-104. Cushioning, blocking, bracing, anchoring, closure and strapping shall be in accordance with the crate specification.

5.2.2 **Level B.** The cabinets shall be packed in a manner which will ensure arrival at destination in a satisfactory condition and which will be acceptable to the carrier at lowest rates. Containers and packing shall comply with Consolidated Freight Classification Rules and Regulations or National Motor Freight Classification Rules or rules and regulation of other carriers as applicable to the mode of transportation.

5.3 **Marking.** Interior and exterior containers shall be marked in accordance with MIL-STD-129. The shipment marking nomenclature shall be as follows:

Cabinet, Drying, Parachute, Type MA-1

6. NOTES.

6.1 **Intended use.** The drying cabinet covered by this specification is intended for drying deceleration parachutes.

6.2 **Ordering data.** Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Level of packaging and packing (see 5.1 & 5.2).
- c. Preproduction test report (see 4.5.2).
- d. When the equipment specified in 3.18 is to be Government loaned.

6.3 **Subject term (Key Word) listing.**

Cabinet
Drying rack
Loading ramp

6.4 **Changes from previous issue.** The outside margins of this document have been marked with a vertical line to indicate where changes (deletions, additions, etc.) from the previous issue have been made. This has been done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content as written irrespective of the marginal notations and relationship to the last previous issue.

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