



Standard Specification for Dehumidifier, Shipboard, Mechanically Refrigerated, Self- Contained¹

This standard is issued under the fixed designation F1075; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers self-contained dehumidifiers using hermetic refrigerant motor-compressors.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 The following safety hazards caveat pertains only to the test methods portion, Section 11, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

B117 Practice for Operating Salt Spray (Fog) Apparatus

B280 Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service

D1654 Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

D2247 Practice for Testing Water Resistance of Coatings in 100 % Relative Humidity

2.2 ASHRAE Standard:³

ASHRAE—15 Safety Code for Mechanical Refrigeration

2.3 Official Classification Standard:⁴

Uniform Freight Classification Ratings, Rules, and Regulations

¹ This specification is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.11 on Machinery and Piping Systems.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329.

⁴ Available from Uniform Classification Agent, Tariff Publication Officer, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.

2.4 UL Standards:⁵

UL 474 Dehumidifiers

UL 984 Hermetic Refrigerant Motor—Compressors

2.5 Military Documents:⁶

MIL-S-901 Specification Requirements for Shock Tests, High Impact (H.I.); Shipboard Machinery, Equipment, and Systems

MIL-STD-167-1 Mechanical Vibrations of Shipboard Equipment, (Type I—Environmental and Type II—Internally Excited)

MIL-D-19947 Specification for Dehumidifier, Space, Mechanically Refrigerated, Self-Contained, Naval Shipboard

3. Ordering Information

3.1 Orders for products under this specification shall include the following information, as necessary, to describe adequately the desired product:

3.1.1 Title, ASTM designation, and year of issue,

3.1.2 Quantity (number of dehumidifiers),

3.1.3 Certification if required, and

3.1.4 Additions to the specification and supplementary requirements, if required.

4. Materials and Manufacture

4.1 In addition to the requirements cited in this specification, the dehumidifiers covered by this specification shall be designed, constructed, assembled, and tested to comply with UL 474, UL 984, and ASHRAE Standard 15. In the event of differences between any of the requirements of this specification and those of other referenced documents, the requirements of this specification shall govern. The manufacturer shall certify compliance with the above standards for equipment furnished and shall be cited in the UL Electrical Appliance and Utilization Equipment product directories.

4.2 The dehumidifier shall consist of a motor-compressor, condensing unit, dehumidifying coil, air-circulating fan, and

⁵ Available from Underwriter's Laboratories Inc., 333 Pfingsten Rd., Northbrook, IL 60062.

⁶ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

accessories, all enclosed within a metal cabinet. The dehumidifier shall be complete, self-contained with the refrigeration equipment dehydrated, and charged with the necessary operating quantity of refrigerant and oil. Each unit shall be ready for operation after removal of shipping protection, opening of valves where provided, and connection to electric power.

4.3 The motor-compressor shall be of the hermetic type and shall consist of a compressor and motor enclosed in a gastight shell. The hermetic compressor unit shall conform to UL 984 and shall be at least $\frac{1}{6}$ hp. Equipment shall operate on 115-V, single-phase, 60-cycle alternating current. The unit shall be protected against overload by a thermal protector built into the motor. The thermal protection shall be either the manual or automatic reset type.

4.4 Piping necessary for the satisfactory operation of the equipment shall be provided by the manufacturer. Tubing shall be made of copper in accordance with Specification B280. Piping connections shall be arranged in such a manner so as not to impair the vibration-isolation properties of absorption-type mounts, where such mounts are provided. Piping shall be securely supported to minimize strain and vibration. Piping connections shall not be made of soft solder.

4.5 Materials used in the manufacture of the equipment shall be corrosion-resistant or treated to resist corrosion. The method of manufacture shall not impair physical, structural, or corrosion-resistant properties of the components. Materials, coatings, and paint systems shall satisfactorily pass the applicable salt spray and humidity test specified in this specification.

4.6 Bolts, nuts, studs, pins, screws, and such other fastenings or fittings shall be of a corrosion-resisting material, or of a material treated in a manner to render it adequately resistant to corrosion. Screws exposed in final assembly shall be corrosion-resisting material.

4.7 Similar parts, including repair parts, or corresponding apparatus furnished on the same contract or order, or built to the same drawings, shall be strictly interchangeable without the necessity of further machining or hand fitting of any kind.

4.8 A plastic or other chemically inert container shall be provided for collecting the condensate. The container shall be of a size and configuration that will fit within the cabinet enclosure. The container shall be provided with baffles to prevent the overflow or spilling of water and shall be readily removable from the dehumidifier cabinet. A male fitting shall be provided from the container for connection of a 0.375-in. (10-mm) inside diameter flexible rubber tubing for draining the condensate (wall thickness 0.125 in. (3 mm)). The rubber tubing will not be required to be furnished by the contractor.

4.9 Provision shall be made in the frame to permit securing the cabinet to any appropriate surface.

4.10 Identification plates shall be of a nonferrous metal or corrosion-resisting steel and shall conform to UL 474.

5. Performance Requirements

5.1 The unit shall be capable of condensing at least 1.8 gal (7 L) of water in 24 h at an ambient temperature of 90°F (32°C) dry bulb and 60 % relative humidity.

5.2 The unit shall operate satisfactorily in a maximum ambient temperature of 110°F (43°C) and a minimum relative humidity of 30 %. Under these conditions of maximal load, the temperature rise of the hermetic motor shall not exceed 158°F (70°C).

5.3 The equipment shall operate satisfactorily when inclined at an angle of 15° on each side of the vertical, in each of two vertical planes at right angles to each other.

6. Other Requirements

6.1 *Design Documentation*—A master drawing of a built configuration shall be provided for each of the following:

- 6.1.1 Complete dehumidifier,
- 6.1.2 Motor compressor,
- 6.1.3 Condenser, and
- 6.1.4 Fan and cooling coil.

6.1.5 Each master drawing shall show outline, mounting, attachment, and connection dimensions, including methods and sizes of fastenings and clearances for installation and servicing, plus supplementary data as necessary to permit installation without suppliers assistance. The drawing shall illustrate design, construction, operation (or function), and identity of parts. Where acceptance tests are required, the tests shall be identified, and approval authority and date shall be noted on the drawing. Subassembly drawings shall be provided to supplement master drawings where desirable.

6.2 Schematic Drawings:

6.2.1 Schematic drawings shall be provided that include all mechanical, piping and electrical circuits, and connections.

6.2.2 All symbols used for equipment components or parts shall be given a piece number and identified in the list of materials with the following information:

- 6.2.2.1 Piece number,
- 6.2.2.2 Quantity required,
- 6.2.2.3 Descriptive name,
- 6.2.2.4 Manufacturer,
- 6.2.2.5 Manufacturer's model or identifying number,
- 6.2.2.6 Manufacturer's drawing number, and
- 6.2.2.7 Weight.

6.3 *Manuals*—Manuals shall be typed in accordance with the manufacturer's commercial practice. Photo views of the equipment shall be included as part of the general description. A section shall be provided containing reduced copies of all drawings required to amplify or illustrate the text including diagram and assembly drawings.

7. Workmanship, Finish, and Appearance

7.1 All materials forming a part of the finished product shall be new and suitable for the purpose intended. The materials shall be free from any defects that might affect the serviceability or appearance of the finished product.

7.2 Seal caps in the refrigerant system shall be provided with a gasket and shall be tight against any leaks.

7.3 Bolts, nuts, and screws shall be tight and equipment and parts shall be properly fastened and secured.

7.4 No parts or components shall be fractured, split, torn, dented, or otherwise defective.