

MIL-C-26058C (USAF)
21 October 1964
 Superseding
 MIL-C-26058B (USAF)
 5 February 1964

MILITARY SPECIFICATION

CARTRIDGE, GAS PURIFIER, EXTREMELY LOW DEWPOINT, TYPE MA-2

1. SCOPE

1.1 This specification covers one type of dehydration cartridge, designated Type MA-2.

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-S-571	Solder, Tin Alloy, Lead Tin Alloy, and Lead Alloy
QQ-T-425	Tinplate (Hot Dip and Electrolytic)
TT-N-95	Naphtha, Aliphatic
PPP-B-621	Boxes, Wood, Nailed and Lock-Corner
PPP-B-636	Box, Fiberboard

Military

MIL-P-116	Preservation, Methods of
MIL-D-3716	Desiccants, Activated for Dynamic Dehumidification
MIL-P-3803	Plastic, Polyethylene, Molded and Extruded Shapes, Sheets and Tubing
MIL-C-4810	Cylinder, Oxygen Purifier, Type MB-1
MIL-F-5566	Fluid, Anti-Icing (Isopropyl Alcohol)
MIL-T-7003	Trichloroethylene, Stabilized Degreasing
MIL-D-70327	Drawings, Engineering and Associated Lists

STANDARDS

Military

MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of U. S. Military Property

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MIL-STD-143 Specifications and Standards, Order of
Precedence for the Selection of
MIL-STD-831 Test Reports, Preparation of

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Qualification. The cartridge furnished under this specification shall be a product that has been tested, and passed the qualification tests specified herein, and has been listed on or approved for listing on the applicable qualified products list. (See 6.3.)

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

<u>Item Name</u>	<u>See Requirement</u>
Container	3.7.1
Filters	3.7.2
Desiccant	3.7.3

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.

3.4 Materials. Materials that are combustible, deteriorate easily, or are otherwise adversely affected by continued use with high-pressure oxygen, hydrogen, helium, nitrogen, or air shall not be used in the cartridge.

3.4.1 Combustibility. Materials that are combustible in contact with high-purity (99.5 percent) oxygen are at 300° F and 2,000 psig shall not be used in the cartridge.

3.4.2 Protective treatment. When materials are used in the construction of the cartridge 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.

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3.5 Design and construction. The cartridge shall fit into a cylinder conforming to MIL-C-4810 and shall be designed and constructed in accordance with figure 1.

3.6 Performance

3.6.1 Moisture removal. The cartridge shall maintain an outlet moisture content not in excess of that equivalent to a dewpoint of -65°F at 450 psig (approximately -108°F at 0 psig) in a minimum of 500 standard (70°F and 760 mm Hg) cubic feet of gas saturated at $130 +5 -0^{\circ}\text{F}$ and $450 +0 -25$ psig, and passed through the cartridge at a flow rate of not less than 10 scfm under these conditions.

3.6.2 Settling and compaction. The contents of a vertically mounted cartridge shall not be settled or compacted so as to permit the top end retainer being depressed into the cartridge body to a depth greater than 15/32 inch below the top of the cartridge end seam after being subjected to vibration with a vertical double amplitude of not less than 0.032 inch and a simultaneous horizontal double amplitude of not less than 0.035 inch applied over a frequency range of 10 to 55 cps for not less than 20 hours, and when:

a. The cartridge remains in the same position it occupied during the vibration

b. The top end cover has been removed in a manner which will not damage the end-to-body seam or restrict movement of the end retainer

c. An evenly distributed force of not less than 7 pounds is applied along the cartridge centerline so as to force the end retainer into the cartridge body, and

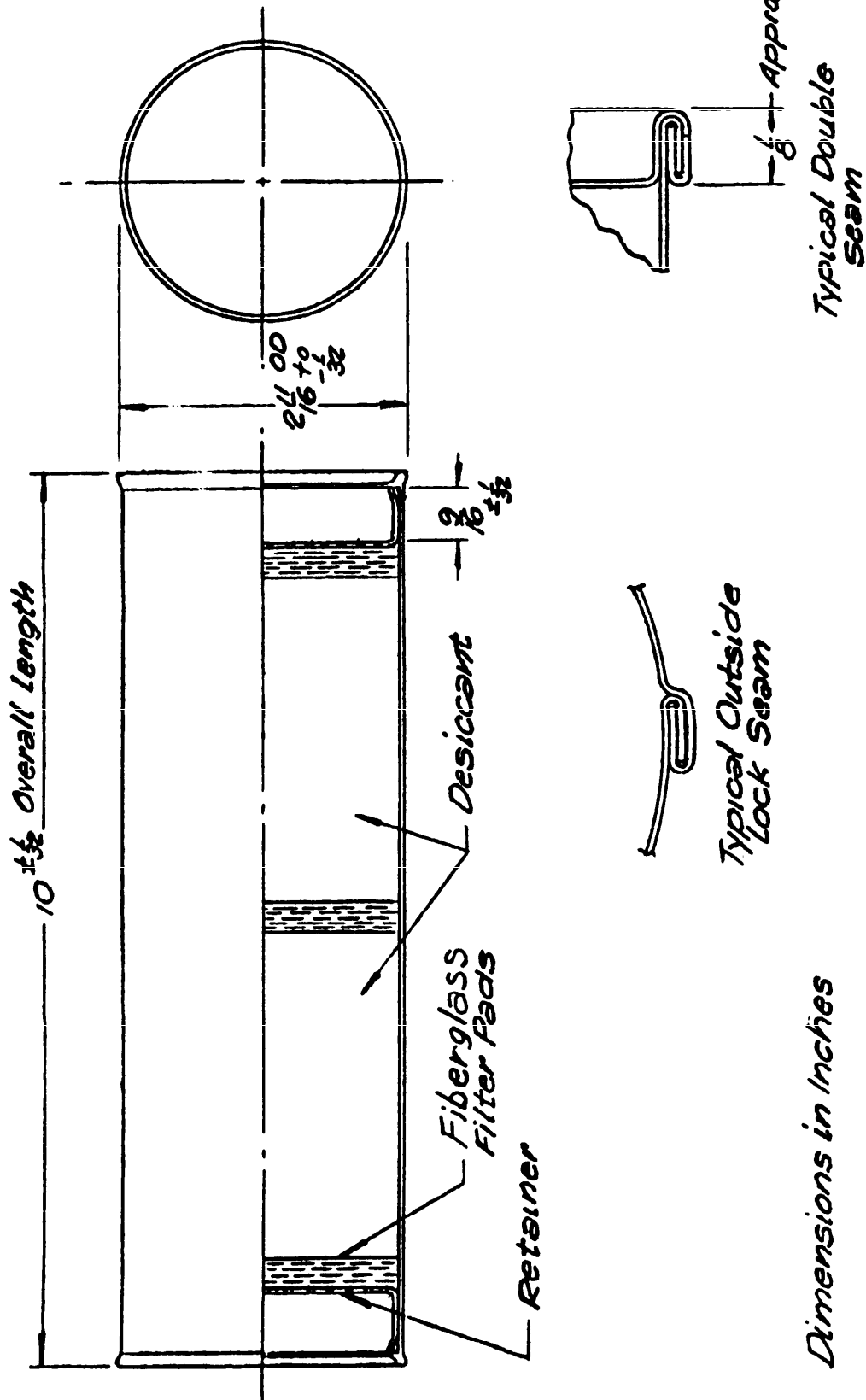
d. The end retainer depression is measured parallel to the cartridge centerline from the extreme top edge of the cartridge end seam to the rim of the retainer cup.

3.6.3 Leakage. Indication of leakage shall not be evident when a cartridge previously temperature stabilized at 80°F or below is totally immersed for not less than 30 minutes in water maintained at 180°F .

3.7 Details of components**3.7.1 Container**

3.7.1.1 Body. The container body shall be fabricated from type I, grade 3 107-pound base weight (pounds per base box) tinplate, having a tin coating

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Dimensions in Inches

Figure 1 - Cartridge Details

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of 1.05 pounds per base box minimum average weight test value in accordance with QQ-T-425.

3.7.1.2 Seams. The body joint shall be an outside lock seam soldered the entire length with tin-lead solder (see 3.7.1.5). The end-to-body seam shall be a double seam approximately 1/8 inch in height. (See figure 1 for a typical lock and double seam.)

3.7.1.3 Ends. The container ends shall be fabricated from type I, grade 3, 75- to 90-pound base weight (pounds per base box) tinplate, having a tin coating of 1.05 pounds per base box minimum average weight test value in accordance with QQ-T-425.

3.7.1.4 Lining compound. Lining compound used for end sealing shall be as recommended by the manufacturer. The lining compound shall not adversely affect or be affected by the desiccant.

3.7.1.5 Soldering. Soldering operations shall be made with tin-lead solder, composition Sn40, Sn50, or Sn60 conforming to QQ-S-571. Corrosive or combustible flux may be used provided all traces of flux are removed from the outside of the cartridge and, insofar as possible, from the inside of the cartridge. A minimum of 5 mg of solvent extractable flux may be left inside the cartridge. Flux containing toxic materials or giving off toxic fumes at a temperature of 200° F or less shall not be used.

3.7.1.6 End retainers. Retainers shall be provided at the ends of the cartridge as shown on figure 1. The retainers shall be formed from iron or steel sheet of nominal 0.030 inch thickness and perforated with 3/32-inch holes on 3/16-inch centers. The retainers shall be a free-sliding fit with a clearance not to exceed 0.078 inch on diameter and shall not be bound into the end seams when the container is sealed.

3.7.2 Filters. Three glass-fiber filters shall be provided in each cartridge, one at each end and one in the middle as shown on figure 1. The filters shall withstand temperatures up to 600° F without damage. They shall contain no bonding agent or impregnation that will burn or be absorbed by the desiccant. The filters shall be cut not less than 3/4 inch oversize on diameter from glass-wool stock of sufficient density and thickness to support a uniform load of 1-1/2 psi without being compressed to a thickness of less than 5/16 inch. The filters shall be so installed that free passage of gases or desiccant particles will not occur between the filter and the wall of the container, and so as to prevent desiccant dust from leaving the cartridge.

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3.7.3 Desiccant. The desiccant material shall meet the particle size, particle strength, and corrosiveness requirements as applicable to type II, grade H desiccant in accordance with MIL-D-3716. The desiccant particle size shall be between 8 and 16 mesh. The desiccant shall be mechanically and chemically nontoxic and shall not deliquesce in the presence of water or water vapor. A gas or liquid shall not be produced or caused to be produced by the desiccant material in reaction to water or water vapor.

3.7.3.1 Desiccant quantity. The cartridge shall be filled with sufficient desiccant to insure that:

a. The desiccant will be held in compression by the fiberglass pads after cartridge assembly

b. When the top cover is removed from a cartridge with its centerline in the vertical plane, the end retainer will be so forced from the cartridge body by the filter pad resiliency that the upper edge of the retainer cup lip will extend not less than 1/32 inch outside the cartridge beyond the unbroken end-to-body seam.

3.8 Part numbering of interchangeable parts. All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The item identification and part number requirements of MIL-D-70327 shall govern the manufacturer's part numbers and changes thereto.

3.9 Exterior finish. The exterior surface of the cartridge shall be finished with tinplate only.

3.10 Operational markings

3.10.1 Handling instructions. The instructions specified in table I shall be printed on the polyethylene bag specified in 3.12.3. The printing shall be legible and of a permanent nature.

3.10.1.1 Intended use marking. In addition to the instructions specified in table I, the following note shall be printed on the polyethylene bag:

THIS CARTRIDGE IS INTENDED FOR USE WITH THE TYPE MB-1 OXYGEN PURIFIER CYLINDER TO DRY HIGH-PRESSURE AIR, OXYGEN, HYDROGEN, HELIUM, OR NITROGEN GASES DURING GROUND SERVICING OF AIRCRAFT OR MISSILE GAS SYSTEMS.

3.11 Identification of product. The cartridge protective bag shall be marked in accordance with MIL-STD-130 as specified for parts.

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TABLE I

**INSTRUCTIONS FOR REPLACING
CARTRIDGES IN CARTRIDGE HOLDERS**

1. Release pressure in cartridge holder.
2. Remove cartridge holder cap assembly and extract exhausted cartridge.
3. Inspect cartridge holder and cap assembly to make sure gaskets are in proper condition and position.
4. Cartridge holder interior should be free from dust, paint, or metal chips; grease; oil; water; or other contaminants.
NOTE: When oil, grease, or any hydrocarbon is found in cartridge holders on BREATHING OXYGEN, or water-pumped nitrogen, hydrogen, helium, or air servicing units, remove the complete cartridge holder from the unit, wash the holder (including cap assembly) in clean, pure cleaning solvent, then wash with hot water detergent or soap solution. Rinse in clean water, dry, and bake in an oven at 400° F for 1 hour. Install new packing and replace holder on the servicing unit. Avoid even the slightest contamination of the cartridge or cartridge holder with oil or grease, particularly when used on an oxygen servicing unit.
5. Open the end of the plastic bag and slip cartridge into holder. On oxygen servicing units, do not touch the cartridge during insertion.
6. Carefully fit the cap assembly into place, press down, and start threads into engagement. The cutters will be forced into the top and bottom of the cartridge as the cap assembly is screwed into place.
7. Screw cap assembly down to a moderately tight fit using a handtool between the cap lugs.
8. Pressurize SLOWLY and check for leaks.

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3.11.1 End marking. The manufacturer's mark and the year of manufacture shall be stamped on one end of the cartridge.

3.12 Cleaning and degreasing

3.12.1 Cleaning and degreasing prior to assembly. The cartridge shell, including the ends and retaining discs, shall be degreased before assembly. After the cartridge shell side seam and one end have been assembled and sealed, cleaning shall be accomplished by one of the following methods:

3.12.1.1 Method A. A vapor degreasing method with stabilized trichloroethylene conforming to MIL-T-7003 shall be used. The cartridge shall be blown clean and dry with a stream of clean, dry, oil-free air until all traces of the trichloroethylene fluid have been removed.

3.12.1.2 Method B. The cartridge shall be flushed with naphtha conforming to TT-N-95 and blown clean and dry of all solvent with oil-free air. It shall then be flushed with anti-icing fluid conforming to MIL-F-5566 or anhydrous ethyl alcohol and rinsed thoroughly with fresh, clean water. Following this, the cartridge shall be thoroughly dried with a stream of clean, dry, oil-free air.

3.12.1.3 Method C. The cartridge shall be flushed with a hot, inhibited, alkaline cleaner until all traces of foreign matter have been removed and thoroughly rinsed with clean water. It shall then be thoroughly dried with a stream of clean, dry, oil-free air.

3.12.2 Final degreasing. After final assembly and testing, all cartridges shall be degreased and defluxed and thoroughly dried before being packaged in the polyethylene bag specified in 3.12.3. Final degreasing shall be accomplished in accordance with method A, B, or C as specified in 3.12.1.1, 3.12.1.2, and 3.12.1.3. After final degreasing, the cartridge shall be handled in such a manner as to preclude contamination.

3.12.3 Protective bag. After final cleaning and inspection, each cartridge shall be sealed within a polyethylene bag conforming to MIL-P-3803, grade 1 having a minimum thickness of 5 mils. The bag shall be of sufficient size to permit the cartridge to be slipped from the bag and into the holder without touching the cartridge with the bare hands.

3.13 Workmanship. The cartridge shall be fabricated and finished in a thoroughly workmanlike manner. Particular attention shall be given to freedom from blemishes, defects, burrs, and sharp edges; accuracy of dimensions; thoroughness of soldering; et cetera. Loose, spattered, or excess solder; metal chips; solder flux; and all other foreign material shall be removed prior to final degreasing.

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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, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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 tests. The inspection and testing of the cartridge shall be classified as follows:

- a. Qualification testing. See 4.4
- b. Acceptance tests See 4.5

4.3 Test conditions

4.3.1 Instrumentation

4.3.1.1 Pressure measurements. Pressures shall be recorded in pounds per square inch gage. Pressure differentials shall be recorded in inches of water or inches of mercury, as applicable.

4.3.1.2 Temperature measurements. Temperatures shall be measured by appropriately located thermometers or thermocouples used with calibrated potentiometers. Temperatures shall be recorded in degrees Fahrenheit.

4.3.1.3 Flow measurements. Gas flow measurements shall be obtained by passing the material through a properly calibrated meter designed to handle the gas being measured. Gas flow rates shall be reported as standard cubic feet per minute (scfm). Total quantities of gas passed shall be reported as standard cubic feet (scf).

4.3.2 Preparation for test. The cartridge shall be prepared for testing as required by the specific test instructions.

4.3.3 Observations. During the progress of all tests, the performance of the cartridge shall be observed to determine the degree of compliance with all requirements specified herein.

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4.3.4 Test data. Test data shall be recorded as required under the specific tests.

4.3.4.1 Correction of data. If the tests specified herein cannot be conducted under the specified conditions, the tests may, upon approval by the procuring activity for each deviation from the specified conditions, be conducted under other conditions and the performance under the specified conditions calculated from the test results obtained. The manner of calculation shall be demonstrated, and actual data proving the correctness of the calculation methods shall be presented along with the report for review by the procuring activity.

4.3.4.2 Tolerances shall be as follows:

a. Pressure gages shall be accurate to within 2 percent of the numerical figure reported

b. Temperatures shall be accurate to within 2° F

c. Dewpoints/frostpoints shall be accurate to within 3° F

d. Gas flow rates shall be accurate to within 2 percent of the numerical figure recorded

e. Total gas flow quantities shall be accurate to within 2 percent of the numerical figure recorded.

4.4 Qualification testing

4.4.1 Test samples. The qualification tests samples shall consist of 12 cartridges. Samples shall be appropriately identified with the manufacturer's own part number and any additional identification required by the authorizing letter.

4.4.2 Qualification required. Prior to actual procurement, the product that this specification covers shall pass the qualification tests specified herein. If the product is later modified in any way, the modified form shall be subjected to and shall pass the same qualification tests.

4.4.3 Test report. After the qualification tests are completed, three complete copies of a test report in accordance with MIL-STD-831 shall be supplied to the procuring activity.

4.4.4 Qualification tests. Qualification tests and allocation of test samples shall be in accordance with the following schedule:

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<u>Test</u>	<u>Sample Number</u>											
	1	2	3	4	5	6	7	8	9	10	11	12
4.6.1 Examination of Product	X	X	X	X	X	X	X	X	X	X	X	X
4.6.2 Dimensions	X	X	X	X	X	X	X	X	X	X	X	X
4.6.4 Thirty-minute leakage	X	X	X	X	X	X	X	X	X	X	X	X
4.6.5 Quantity of desiccant	X	X	-	-	-	-	-	-	-	-	-	-
4.6.6 Performance test	-	-	X	X	X	X	X	X	X	X	-	-
4.6.7 Solder flux removal	X	-	-	-	-	-	-	-	-	-	-	-
4.6.8 Combustibility	-	X	-	-	-	-	-	-	-	-	-	-
4.6.9 Settling and compaction	-	-	-	-	-	-	-	-	-	-	X	X

4.5 Acceptance tests. The acceptance tests shall consist of the following:

- a. Individual tests
- b. Sampling plan and tests.

4.5.1 Individual tests. Each cartridge shall be subjected to the following tests as described under 4.6:

- a. Examination of product.....See 4.6.1
- b. Dimensions.....See 4.6.2
- c. Two-minute leakage.....See 4.6.3
- d. Cleaning effectiveness.....See 4.6.10.1 and 4.6.10.2.

4.5.2 Sampling plan and tests

4.5.2.1 Lot. A lot shall consist of cartridges manufactured under essentially the same conditions and submitted for inspection at substantially the same time.

4.5.2.2 Sampling plan. Two cartridges shall be selected at random from each lot of 500 or fraction thereof on the order and subjected to the following tests:

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<u>Test</u>	<u>Sample Number</u>	
	1	2
4.6.4 Thirty-minute leakage test	X	X
4.6.5 Quantity of desiccant	X	-
4.6.6 Performance	-	X
4.6.7 Solder flux removal	X	-

4.5.2.2.1 Rejection and retest. When one or more items from a lot fail to meet the specification, acceptance of all items in the lot shall be withheld until the extent and cause of failure are determined. After corrections have been made, all necessary tests shall be repeated.

4.5.2.2.2 Individual tests may continue. For production reasons, individual tests may be continued pending the investigation of a sampling test failure. But final acceptance of the entire lot or lots produced later shall not be made until it is determined that all items meet all the requirements of the specification.

4.5.2.2.3 Defects in items already accepted. The investigation of a test failure could indicate that defects may exist in items already accepted. If so, the contractor shall fully advise the procuring activity of all defects likely to be found and method of correcting them.

4.6 Test methods

4.6.1 Examination of product. The cartridge shall be inspected to determine compliance with the requirements specified herein with respect to materials, workmanship, and marking. Particular attention shall be given to freedom from excess solder or imperfections in the lip formed by the end-to-body seam.

4.6.2 Dimensions. The cartridge shall be checked by go and no-go gages to determine compliance with the diameter and length requirements specified herein.

4.6.3 Two-minute leakage. The cartridge shall be temperature stabilized throughout at 80° F or below immediately prior to this test. The cartridge shall be immersed in water maintained at a minimum temperature of 180° F for a minimum of 2 minutes to check for leakage. A definite continuous forming and breaking away of air bubbles from definite points on the surface of the cartridge shall be

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an indication of leakage and cause for rejection. Presence of bubbles clinging to the surface of the container or occasional formation of bubbles due to escape of air trapped within the seams shall not be considered cause for rejection. If no leakage is evident after this test, the cartridges shall be cleaned in accordance with one of the methods specified in 3.12.1.1, 3.12.1.2, or 3.12.1.3.

4.6.4 Thirty-minute leakage. The cartridge shall be temperature stabilized throughout at 80° F or below immediately prior to this test. The cartridge shall be completely submerged in a hot water bath with the water maintained at a temperature of not less than 180° F for at least 30 minutes. A definite and continuous forming and breaking away of air bubbles from definite points on the surface of the cartridge shall be an indication of leakage and cause for rejection. When a cartridge fails to pass this test, four additional cartridges shall be tested. Failure of any of the additional four shall be cause for rejection of the lot. Presence of bubbles clinging to the surface of the container or occasional formation of bubbles due to escape of air trapped within the seams shall not be considered cause for rejection.

4.6.5 Quantity of desiccant. The cartridge shall be placed in an upright position and the top end cover removed in a manner that will not damage the end-to-body seam. The resiliency of the fiberglass filters shall cause the upper edge of the retainer to raise and project not less than 1/32 inch above the top of the cartridge end-to-body seam, or the cartridge shall be considered to have failed the test. When a cartridge fails to pass this test, four additional cartridges shall be tested. Failure of any of the additional four shall be cause for rejection of the lot.

4.6.6 Performance test

4.6.6.1 Apparatus. Apparatus for this test shall consist of a 10-cfm source of 450-psi oil-free air or nitrogen, a saturator, dewpoint meter, and gas-flow measuring apparatus. The dewpoint meter shall be accurate to within ± 3 percent and verification of the accuracy of the dewpoint meter shall be furnished.

4.6.6.2 Conditions. The test shall consist of a continuous run until the dewpoint of the gas leaving the cartridge reaches +50° F at 450 psig (approximately -20° F at 0 psig) or until not less than 900 standard (70° F and 760 mm Hg) cubic feet of gas has passed through the cartridge. For qualification testing only, the sample cartridge(s) shall be weighed to an accuracy of ± 0.5 gram immediately before and after each test run.

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4.6.6.3 Test. The air or nitrogen shall be saturated with water vapor at a temperature of not less than 130° F and a pressure not greater than 450 psi. The saturated air or nitrogen shall then be passed through the sample cartridge at the above specified temperature and pressure and at the rate of 10 scfm. The dewpoint and quantity of flow shall be measured. The flow rate shall be constant for each run to within ± 1 percent.

4.6.6.3.1 The following readings shall be taken at intervals of not less than 2 minutes during a test run:

- a. Saturator temperature and pressure
- b. Temperature at inlet to cartridge
- c. Dewpoint/frostpoint of gas leaving cartridge
- d. Rate of flow through cartridge
- e. Total flow through cartridge.

4.6.6.3.1.1 The total moisture content of the gas leaving the cartridge shall not exceed that equivalent to a frost point of -65° at 450 psig before a total flow of 500 standard (70° F and 760 mm Hg) cubic feet or the cartridge shall be considered to have failed the test. When a cartridge fails to pass this test, four additional cartridges shall be tested. Failure of any of the additional four shall be cause for rejection of the lot.

4.6.7 Solder flux removal test. The interior and exterior of the cartridge shall be examined to determine if any solder flux is evident. The seams of the cartridge shall be washed with a flux solvent and the amount of flux extractable determined. If more than 5 mg of the flux is found in the cartridge, the cartridge shall be rejected.

4.6.8 Combustibility test. Samples of each of the materials used in the cartridge shall be tested for combustibility by exposing them to oxygen at high temperatures. Approximately 0.5 gram of each material shall be placed in an oxygen bomb that shall be pressurized to 2,000 psi with 99 percent pure oxygen and heated uniformly to 300° F for not less than 1 hour. A sudden temperature rise or change in the appearance of the material shall be considered to be evidence of combustion and noncompliance with 3.4.1.

4.6.9 Settling and compaction test. The cartridge shall be mounted in an upright position on the test facility. The facility shall be

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so adjusted that a vertical double amplitude of 0.032 inch and a horizontal double amplitude of 0.035 inch will be applied over a range of frequencies beginning at 10 cps, increasing to 55 cps, and returning to 10 cps over a time interval of 2 minutes. The above vibration sequence shall be continued for 20 hours. With the cartridge remaining in an upright position on the vibration facility, the top end cover shall be removed in a manner that will not damage the end-to-body seam or restrict free movement of the end retainer. An evenly distributed force of no less than 7 pounds shall then be applied vertically downward on the end retainer to force it into the cartridge body. The top edge of the retainer rim shall not be depressed to more than 15/32 inch below the top of the cartridge end seam, or the cartridge shall be considered to have failed the test.

4.6.10 Cleaning effectiveness tests

4.6.10.1 Visual inspection. During and after assembly, the cartridge shell, including the ends and retaining discs, shall be visually examined for evidence of corrosion products, metal chips, scale, oil, grease, paints, preservatives, decals, or other contamination or foreign matter. Any evidence of contamination or foreign matter shall require recleaning and retest.

4.6.10.2 Ultraviolet light inspections. With the cartridge shell side seam and one end assembled and sealed, all accessible surfaces and parts of the cartridge shall be visually inspected for hydrocarbons with ultraviolet light. With the container filled and completely closed, the cartridge shall again be visually inspected for hydrocarbons with ultraviolet light. Evidence of fluorescence during either inspection shall require recleaning and retest.

4.7 Inspection of the preservation, packaging, and packing. The inspection of the preservation, packaging, and packing shall be in accordance with the instructions of section 5 herein.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be level A or C as specified (see 6.2).

5.1.1 Level A

5.1.1.1 Prior to preservation and packaging, each cartridge shall be thoroughly cleaned and dried in accordance with 3.12.2.

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5.1.1.2 Cartridges bagged in accordance with 3.12.3 shall be unit packaged one each, method III in accordance with MIL-P-116 in containers conforming to PPP-B-636. Closure and sealing of the containers shall be in accordance with the specification and appendix thereto.

5.1.2 Level C. Packaging shall be in accordance with the manufacturers commercial practice.

5.2 Packing

5.2.1 Packing shall be levels A, B, or C as specified (see 6.2). Shipping containers insofar as practical shall be uniform in size and shape and of minimum cube and tare weight consistent with the protection required, and shall contain identical quantities.

5.2.1.1 Level A. Cartridges preserved and packaged in accordance with 5.1.1 shall be packed in an overseas type container conforming to PPP-B-621. Closure and strapping shall be in accordance with the container specification and appendix thereto.

5.2.1.2 Level B. Cartridges preserved and packaged as specified in 5.1.1 shall be packed in domestic-type exterior containers conforming to PPP-B-621, or PPP-B-636. Exterior containers shall be of uniform shape and size and shall contain identical quantities. Containers shall be closed and strapped in accordance with the applicable container specification or appendix thereto.

5.2.1.3 Level C. Cartridges preserved and packaged as specified in 5.1 which require overpacking for acceptance by carrier shall be packed in a shipping container which will insure safe delivery at the lowest transportation rate. Containers shall meet the Consolidated Freight Rules and regulations of other common carriers as applicable to the mode of transportation.

5.3 Marking. Unit, intermediate, and shipping containers shall be marked in accordance with MIL-STD-129. The nomenclature shall be:

Cartridge, Gas Purifier, Extremely Low Dewpoint, Type MA-2

6. NOTES

6.1 Intended use. The Type MA-2 cartridge is intended for use in the Type MB-1 oxygen purifier cylinder conforming to MIL-C-4810 and will be utilized to dehydrate high-pressure gases for charging aircraft and missile high-pressure gas systems from the ground.

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6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification
- b. Applicable levels of preservation and packaging, and packing (See 5.1 and 5.2.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for such products as have, prior to the time set for opening of bids, been tested and approved for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date. The attention of suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Systems Engineering Group, Wright-Patterson Air Force Base, Ohio, Attn: SEMSF, and information pertaining to qualification of products may be obtained from that activity.

Custodian:
Air Force - 11

Preparing activity:
Air Force - 11

Reviewers:
Air Force - 11, 84

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004
INSTRUCTIONS		
This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use of the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity.		
SPECIFICATION		
ORGANIZATION		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$
MATERIAL PROCURED UNDER A		
<input type="checkbox"/> Direct Government Contract <input type="checkbox"/> Subcontract		
1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? A. GIVE PARAGRAPH NUMBER AND WORDING		
B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES		
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID		
3. IS THE SPECIFICATION RESTRICTIVE? <input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES" IN WHAT WAY?		
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)		
SUBMITTED BY (Printed or typed name and activity)		DATE

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