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AEROSPACE STANDARD

SAE AS8181 REV. A

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Superseded by AS5498

Detector, Ice, Air Intake Duct, Aircraft Engines and Airframe Systems, General Specification For

CANCELLATION NOTICE

This document has been declared "CANCELLED" as of June 2002 and has been superseded by AS5498. By this action, this document will remain listed in the Numerical Section of the Aerospace Standards Index noting that it is superseded by AS5498.

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NOTICE

This document has been taken directly from U.S. Military Specification MIL-D-8181B and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards.

The original Military Specification was adopted as an SAE standard under the provisions of the SAE Technical Standards Board (TSB) Rules and Regulations (TSB 001) pertaining to accelerated adoption of government specifications and standards. TSB rules provide for (a) the publication of portions of unrevised government specifications and standards without consensus voting at the SAE Committee level, (b) the use of the existing government specification or standard format, and (c) the exclusion of any qualified product list (QPL) sections.

1. SCOPE:

1.1 Scope:

This specification establishes requirements for ice detectors.

1.2 Classification:

This specification establishes requirements for two types of ice detectors (see 6.2):

Type I: Those ice detectors that require ice buildup on the probe for detection.
Type II: Those ice detectors that detect impending ice and do not require ice buildup on the probe for detection.

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-P-416	Plating, Cadmium (Electrodeposited)

Military

MIL-P-116	Preservation, Methods of
MIL-C-5015	Connectors, Electric, “AN” Type
MIL-B-5087	Bonding, Electrical (for Aircraft)
MIL-E-5272	Environmental Testing, Aeronautical and Associated Equipment, General Specification for
MIL-E-5400	Electronic Equipment, Aircraft, General Specification for
MIL-E-5557	Enamel, Heat-Resisting, Glyceryl-Phthalate, Black
MIL-D-6055	Drums, Metal Reusable, Shipping and Storage (Capacity from 88 to 510 Cubic Inches)
MIL-I-6181	Interference Control Requirements, Aircraft Equipment
MIL-S-6743	Switches, Push Button and Limit
MIL-S-7742	Screw Threads, Standard Optimum Selected Series: General Specification for
MIL-L-7808	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-P-7936	Parts and Equipment, Aeronautical, Preparation for Delivery
MIL-P-8585	Primer Coating, Zinc Chromate, Low-Moisture-Sensitivity
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-N-25027	Nut, Self-Locking, 250°F, 500°F, and 800°F, 125 KSI FTU, 60 KSI FTU, and 30 KSI FTU
MIL-D-70327	Drawings, Engineering and Associated Lists

STANDARDS

Military

MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of US Military Property
MIL-STD-143	Specifications and Standards, Order of Precedence for the Selection of
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts
MIL-STD-704	Electric Power, Aircraft, Characteristics and Utilization of
MIL-STD-831	Test Reports, Preparation of

2.1 (Continued):

MS20995	Wire, Lock
MS33540	Safety Wiring, General Practices for
MS33586	Metals, Definition of Dissimilar
MS33588	Nuts and Plate Nuts, Self-Locking, Aircraft Design and Usage Limitations of
MS33678	Connector, Receptacle, Electric, Integral Mounting

(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 Preproduction:

This specification makes provision for preproduction testing.

3.2 Data:

Unless otherwise specified in the contract or order, no data are required by this specification or any of the documents referenced in section 2 (see 6.2).

3.3 Components:

The ice detector assembly shall consist of no more than two separate components, an ice detector probe and an auxiliary equipment such as an amplifier or transformer.

3.4 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.

3.4.1 Standard parts: Standard parts (MS or AN) shall be used wherever they are suitable for the purpose, and shall be identified on the drawing by their part numbers. Commercial utility parts such as screws, bolts, nuts, cotter pins, etc., may be used, provided they possess suitable properties and are replaceable by the standard parts (MS or AN) without alterations, and provided the corresponding standard part numbers are referenced in the parts list and, if practicable, on the contractor's drawings. In the event there is no suitable corresponding standard part in effect on date of invitation for bids, commercial parts may be used provided they conform to all requirements of this specification.

3.5 Materials:

Materials shall conform to the applicable specifications specified herein. When materials are used that are not specifically designated, they shall be entirely suitable for the purpose.

3.5.1 Metals: Metals shall be corrosion resistant or suitably treated to resist corrosion due to atmospheric and climatic conditions encountered during storage or service usage.

3.5.2 Dissimilar metals: Unless suitably protected against electrolytic corrosion, dissimilar metals as defined in MS33586 shall not be used in intimate contact with each other. Magnesium or magnesium alloys shall not be used.

3.5.3 Castings: Castings shall be clean, sound, and free from blowholes, porosity, cracks, and other defects.

3.5.4 Fungus-proof materials: Materials that are not nutrients for fungi shall be used to the greatest extent practicable. Where materials that are nutrients for fungi must be used, they shall be treated with a fungicidal agent approved by the procuring activity.

3.6 Design:

The ice detector assembly shall be designed to:

(a) Operate a warning device to indicate to the pilot when dangerous icing conditions are encountered.
(b) Transmit an electrical signal which can be used to control operation of the ice protection system.

3.6.1 Simplicity: The ice detector shall be as small as practicable, and shall not require periodic adjustment or calibration. It shall be simple to install and so designed that overhaul and repair can be accomplished easily without the use of special tools and fixtures.

3.6.2 Electric power: Electric power requirements for the ice detector shall conform to MIL-STD-704. Electric power required to conform to all other requirements of this specification shall be in accordance with category C of MIL-STD-704.

3.6.3 Radio interference: Interference control requirements shall be in accordance with MIL-I-6181.

3.6.4 Switching: The ice detector shall be capable of switching inductive external circuit having a potential up to the maximum specified in 3.6.2 and a steady-state power consumption of 30 watts.

3.6.5 Bonding: Bonding shall conform to MIL-B-5087.

3.6.6 Standard electronic parts: Electronic parts, and the application thereof, shall be in accordance with MIL-E-5400. The use of electronic tubes shall be avoided, wherever practicable.

3.6.7 Switches: Switches shall be in accordance with MIL-S-6743. Ice detectors incorporating electrical circuitry shall incorporate a checkout circuit to simulate ice or impending ice at the detector probe. The test switch shall enable the pilot to give the detector assembly a functional test during preflight inspection.

3.6.8 Contacts: Electrical contacts shall be made of silver or other suitable material approved by the procuring activity.

3.6.9 Explosion proofing: The equipment shall be explosion proof (see 4.5.10.10).

3.6.10 Temperature: Temperature ranges shall be:

(a) Type I: The ice detector assembly shall be designed to sense accumulating ice throughout a range of -65° to +45°F.

(b) Type II: The ice detector temperature-sensing element shall have an adjustable calibration range of 32° to 45°F to sense icing conditions. Icing shall be sensed from -65°F to the calibrated limit. The calibration setting shall be evident by permanent markings, in 2°F increments, at the location where the calibration is made. Unless otherwise specified, the calibration setting shall be set at 32°F prior to preproduction testing and shipment.

3.6.11 Thermal lag: If a temperature or thermostat probe is used, it shall be designed for minimum thermal lag.

3.7 Construction:

The ice detector assembly shall be so constructed that no parts will work loose in service. It shall withstand strains, jars, vibrations, damage from foreign objects, and other conditions incident to shipping, storage, installation, and service. Pivots, bearings, and gears shall not bind nor shake and shall be as nearly frictionless as possible. That portion of the ice detector that extends into the airstream shall present the least possible obstruction to flow and be constructed to withstand damage from ice particles that break away from the airframe.

3.8 Performance:

The ice detector shall satisfy the performance requirements specified herein, when subjected to the applicable tests in section 4.

3.9 Weight:

The weight of the ice detector assembly shall not exceed 3 pounds.

3.10 Electrical receptacle:

The ice detector assembly shall be provided with electrical receptacles in accordance with MIL-C-5015, class A, C, or E, and shall conform to MS33678.

3.11 Threads:

3.11.1 Screw threads: Machine screw threads shall conform to MIL-S-7742.

3.11.2 Locking of parts: All threaded parts shall be locked by safety wiring, by all-metal self-locking nuts conforming to MIL-N-25027, cotter pins, or other approved methods. Safety wire shall be installed in accordance with MS33540 and shall conform to MS20995. Self-locking nuts shall be used in accordance with MS33588. Where equipment is to be installed in the engine intake, parts shall be secured so that they will not loosen and thus be ingested by the engine. Self-locking nuts shall not be used where loosening or disengagement of the nut could result in the nut or other parts entering the air stream. The use of lockwashers or staking is not permitted.

3.12 Wiring, internal:

Wires of the ice detector assembly shall conform to MIL-E-5400.

3.13 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.

3.14 Dimensions:

All dimensions and tolerances shall be such as to ensure interchangeability.

3.15 Finish:

3.15.1 Anodizing: All aluminum and aluminum alloy parts shall be anodized in accordance with MIL-A-8625.

3.15.2 Protective treatment: If fabricated of material that rusts or corrodes, parts shall be treated to resist corrosion in accordance with 3.5.1. If cadmium plating is used on steel parts, it shall conform to QQ-P-416. Protective coating that will crack, chip, or scale with age or extremes of climatic and environmental conditions shall not be used.

3.15.3 Paint finishes: All external surfaces except anodized alloy, corrosion-resistant steel, working surfaces, threads, and suitably plated parts shall be finished with one coat of primer conforming to MIL-P-8585 and two coats of black enamel conforming to MIL-E-5557.

3.16 Calibration data:

The contractor shall furnish a table of applicable operating parameters versus ice detector assembly operations. This table shall show the design limits and tolerances of signal assembly operation with simulated icing conditions provided by applied electrical resistance values, applied pressures, or other means. Power requirements shall be included. This table will be the basis for all tests in section 4. A statement of detailed laboratory methods used during calibration tests shall be included with the table.

3.17 Identification of product:

The detector assembly, including all parts, shall be identified in accordance with MIL-STD-130.

3.18 Workmanship:

The ice detector assembly, including all parts and accessories, shall be finished in a workmanlike manner. Particular attention shall be given to neatness of soldering, marking of parts and assemblies, and freedom of parts from burrs and sharp edges.

3.19 Cleaning:

The ice detector assembly shall be cleaned of loose, spattered or excess solder, metal chips and other foreign material after final assembly. Resin flash shall be removed.

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 ice detectors shall be classified as:

(a) Preproduction tests (4.4)
(b) Quality conformance tests (4.7)

4.3 Test conditions:

4.3.1 Test conditions for phase I and quality conformance testing: Unless otherwise specified by the procuring activity, the following conditions shall apply:

4.3.1.1 Standard atmospheric conditions: Whenever the pressure and temperature existing at the time of testing are not specified definitely, the test shall be made at atmospheric pressure (approximately 29.92 inches Hg) and at room temperature (approximately 77°F). When tests are made with atmospheric pressure or room temperature differing materially from the above values, proper allowance shall be made for the difference.

4.3.1.2 Attitude: The ice detector assembly shall be tested as though mounted on the outside of an air inlet duct, with ice detector probe extending into the duct in a horizontal plane.

4.3.1.3 Connection: The ice detector probe component and the auxiliary equipment component shall be connected electrically and tested as a complete unit.

4.3.1.4 Electric power: Electric power shall be in accordance with MIL-STD-704 (see 3.6.2). Power consumption shall not exceed the limits specified in 3.16.

4.3.1.5 Switching circuit: When an output switch is required, it shall be connected in a circuit in accordance with 3.6.4, with a closed circuit current of 0.9 ±0.1 amp, including a lamp for indicating operation of the detector.

4.3.2 Conditions for phase II testing: Conditions for phase II testing shall be as specified in 4.3.2.1, 4.3.2.2, and 4.3.2.3.

4.3.2.1 Aircraft operation: The aircraft operating parameters required during flight testing or as simulated in the test cell shall be as specified by the procuring activity.

4.3.2.2 Airstream temperature: The airstream temperature at the detector probe shall be within the limits specified in table I.

4.3.2.3 Liquid water content: Liquid water content shall be varied in increments of 0.5 gram/cubic meter of air for each range specified in table I. Each increment of liquid water content shall be of sufficient duration to ensure proper operation of the detection system.

4.4 Preproduction tests:

Preproduction testing shall consist of testing phase I and phase II test samples. Prior to testing in accordance with phase II, phase I tests and reports shall be approved by the procuring activity.

TABLE I. Airstream temperature and water content

Attribute	Condition I	Condition II	Condition III
Airstream temperature	-10 to 0°F	20° to 30°F	Above freezing
Liquid water content	0.2 to 1.2 grams/ cubic meter	0.5 to 2 grams/ cubic meter	1 gram/cubic meter
Mean effective droplet diameter	10 - 25 microns	10 - 25 microns	10 - 25 microns

4.4.1 Test sample: The test samples shall be representative of the production equipment. The samples shall be identified with the manufacturer's part number and such other information as required by the procuring activity (see 6.2). The samples shall be:

(a) Phase I test samples shall consist of four ice detector assemblies.

(b) Phase II test samples shall consist of one or more complete ice detector assemblies, identical in operation to those tested under phase I, for testing as in actual flight.

4.4.2 Test report, test samples, and data for the procuring activity: When the tests are conducted at a location other than the laboratory of the procuring activity, the following shall be furnished to that activity:

(a) Three copies of a test report in accordance with MIL-STD-831.

(b) The samples that were tested.

(c) One complete set of reproducible detail and assembly drawings.

4.5 Phase I tests:

The first ice detector shall be subjected to a humidity test only, as specified in 4.5.10.7; the second ice detector shall be subjected to a salt spray test only, as specified in 4.5.10.8; and the third ice detector shall be subjected to a fungus test only, as specified in 4.5.10.9; the fourth ice detector shall be subjected to the remaining phase I tests.

4.5.1 Examination of product: Each ice detector shall be thoroughly examined to determine conformance to this specification with respect to materials, workmanship, design, construction, and nameplate.

4.5.2 Operation check: Each ice detector assembly shall be checked to assure that it meets the functional requirements of this specification. Tests shall assure proper operation of the detector probe and the de-icing circuitry, including all heating elements. Each detector assembly shall be tested by the following applicable procedures and shall not differ in the operation point by more than the design limits specified in the data presented in 3.16.

(a) Ice detector assemblies that use air pressure for operation shall be subjected to a range of pressures to simulate the duct air velocities specified in 4.5.4.

(b) Circuits of ice detectors which contain electrical components shall be checked separately to assure that false indication does not occur.

(c) Probes of ice detectors that cannot be checked by air pressure shall be tested with ice or other substances to simulate icing or impending ice at the probe.

(d) Probes of type II ice detectors shall be tested to assure that a false indication does not occur when the probe is subjected to moisture and above freezing temperatures or to dry air and below freezing temperatures.

4.5.2.1 Vacuum tube replacement: Following the operational check, each vacuum tube in the assembly shall be removed individually and replaced consecutively with six tubes of identical type designation taken at random from stock. With each tube replacement the ice detector assembly shall be tested as specified in 4.5.2. The operation point for each tube replacement shall not differ from the operation point value. There shall be no control adjustment, such as balance or gain, during this test.

4.5.3 Endurance test: The ice detector assembly shall be subjected to 25,000 cycles conducted at a rate consistent with the applicable calibration climb (see 3.16). The operation point of the detector assembly at the end of this test shall not vary from designed operation point by more than the design limits specified. There shall be no evidence of deterioration which could cause failure or malfunction as a result of this test. The following procedures are applicable:

(a) Ice detectors utilizing air pressure for operation shall be installed in a suitable test rig and shall have their probes subjected to pressures simulating those attained at 300 knots air velocity at sea level. The air pressure shall be applied and cut off alternately until the complete number of cycles has been made. The deicing circuit shall be cycled also.

(b) Ice detectors utilizing any other principles for sensing icing conditions shall be installed in a suitable test rig designed so that operation of their detection and deicing components can be checked for the required number of cycles.

4.5.3 (Continued):

(c) Ice detectors that do not have a deicing cycle shall be installed in a suitable test rig designed so that operation of their detection can be checked for the required number of cycles. A cycle shall consist of an off-on-off ice warning signal. Cycling shall be as fast as practicable, but at such a rate that the system will sense and detect both the presence and absence of icing conditions as evidenced by the signal light turning on or off, as applicable. The ice detector shall be subjected to the required number of cycles.

4.5.4 Icing and deicing: The ice detector shall be tested to assure that it will detect ice under the conditions specified in table II with duct air velocities ranging from 50 to 650 knots, in 100-knot increments.

TABLE II. Anti-icing test conditions

Attribute	Condition I Types I and II	Condition II Types I and II	Condition III Type II	Condition IV Type II
Liquid water content	0.2 gram/cubic meter	2 grams/cubic meter	0.2 gram/cubic meter	2 grams/cubic meter
Atmospheric air temperature	-4°F	23°F	45°F	45°F
Flight velocity	Static	Static	Static	Static
Altitude	Sea level	Sea level	Sea level	Sea level
Mean effective droplet diameter	10 microns	25 microns	10 microns	25 microns
Detector response time:				
Type I	3 min. (max)	10 sec.	---	---
Type II	30 sec.	5 sec.	30 sec.	5 sec.

4.5.4 (Continued):

(a) Type I: After detecting ice, the detector probe shall deice automatically. The ice detector shall be operated continuously under the conditions specified in table II in an air velocity of 300 knots until a minimum of 100 cycles of detection of icing and deicing have been completed. The cycling shall be divided equally between the two conditions. The time required to deice the probe to a condition suitable for the next ice-warning action shall not exceed 7 seconds from the time of the first warning.

(b) Type II: The ice detector shall be tested to ensure that it will sense impending ice throughout the temperature calibration range as follows: The calibration setting shall be at 32°F for testing under conditions I and II of table II and at 45°F for testing under conditions III and IV of table II. The ice detector shall be tested to prevent formation of ice on the probe by leaving the water spray on 5 minutes for each 100-knot increment during testing under conditions I and III and 10 minutes for each 100-knot increment under conditions II and IV. There shall be no visible buildup of ice on the probe during this time. A ±2°F tolerance will be allowed for the temperature calibration setting. The response time of the detector after the water spray has been turned on and off shall be recorded during each run.

4.5.5 False signal: The ice detector shall not produce an icing signal when tested under the following conditions:

(a) Condition II of table II, except that the atmospheric air temperature shall be above 56°F and the air velocity maintained at 250 knots for 1 minute.

(b) The probe shall be covered with a film of MIL-L-7808 (oil) and subjected to an air velocity of 50 knots for 1 minute with an atmospheric air temperature of 20°F. Covering the probe with an oil film shall be achieved by immersing the probe in the oil. Wiping the probe will not be permitted. There shall be no entrained moisture present in the air flow during this test.

4.5.6 Insulation resistance: A potential of 200V shall be applied between any electrical receptacle pin contact and the shell or any metal part of the detector assembly case. The insulation resistance, measured between any pin and the shell or any metal part of the case, shall exceed 20 megohms. Internally grounded electrical receptacle pins shall be excluded from this test.

4.5.7 Dielectric strength: The ice detector assembly shall be capable of operating at the design limits specified in the table required in 3.16 without arcing, flashover, breakdown of insulation, or other visible damage:

(a) For ice detector assemblies designed to operate at less than 10,000 feet, the ice detector assembly shall be tested at atmospheric pressure in accordance with Method 301 of MIL-STD-202. The following details shall apply:

(1) Test voltage - 1,000V root mean square (rms).
(2) Duration of application - 1 minute for preproduction tests. (For quality conformance testing the time may be reduced to 5 seconds with an increase of 20 percent in the test voltage, at the option of the supplier.)
(3) Points of application -

a. Between mutually insulated portions of the assembly.
b. Between insulated portions and ground.

(4) Examination after test - the ice detector assembly shall be examined for evidence of arcing, flashover, breakdown of insulation and any other visible damage.

(b) For ice detector assemblies designed to operate at altitudes exceeding 10,000 feet, the assembly shall be tested the same as in (a) except that the test voltage shall be 400V rms and shall be applied while the assembly is being maintained at a pressure equivalent to that of 70,000 feet altitude.

4.5.8 Position error: If applicable to the design, the change in operating point (caused by rotating the detector assembly components from the normal operating point) shall be determined. Six positions shall be tested, 90 degrees apart, as the detector is rotated in turn on two mutually perpendicular horizontal axes. The position error shall not exceed the design limits specified in calibration data submitted in accordance with 3.16.

4.5.9 Drift: If a pressure-actuated system is used, a pressure differential of 200 percent of the maximum pressure differential which will be encountered in flight shall be applied 500 times to the pressuresensitive element. The operating pressure differential, measured immediately after the 500 applications, shall be within designated limits and tolerances for operation at room temperature.

4.5.10 Environmental tests: Normal operating electrical power shall be applied to the input terminals of the ice detector during all of the following environmental tests. Periods when the ice detector produces an ice warning signal shall be recorded. After testing in accordance with the environmental tests outlined herein, there shall be no damage to the equipment such as deterioration, corrosion, or malfunction. Upon completion of each environmental test, the ice detector assembly shall be capable of operation within the design limits, in accordance with the operational test described in 4.5.2.

4.5.10.1 Vibration: The ice detector assembly components, mounted directly on the engine inlet duct, shall be subjected to vibration tests in accordance with Procedure XII of MIL-E-5272. Performance shall be checked while scanning the frequency range for resonant frequencies including operation at points 2 percent above and below the normal operating point.

4.5.10.1.1 Vibration of auxiliary equipment: If the auxiliary equipment component is not integral with the probe component and is mounted on a separate mounting base on vibration isolators, Procedure XIII of MIL-E-5272 shall be followed. During the vibration test, the components shall be tested in accordance with 4.5.2. The operation point of the auxiliary equipment component shall not vary from the designated operation point by more than the limits specified in 3.16.

4.5.10.2 Low temperature: The ice detector assembly shall be subjected to a low temperature test in accordance with Procedure I of MIL-E-5272. While still at -65°F, the assembly shall be given an operational check in accordance with 4.5.2 to determine whether there is false indication at this temperature. The same tolerance shall apply. The ice detector shall be returned to room temperature for a minimum of 4 hours, and again checked in accordance with 4.5.2. The operation point shall not differ from the designated nominal operation point by more than the limits specified in 3.16.

4.5.10.3 High temperature: The ice detector assembly shall be subjected to a high temperature test in accordance with Procedure II of MIL-E-5272. The assembly shall be returned to room temperature for a minimum of 4 hours and checked in accordance with 4.5.2. The operation point shall not differ from the nominal operation point by more than that specified in 3.16.

4.5.10.4 Temperature shock: The ice detector assembly shall be subjected to a temperature shock test in accordance with Procedure I of MIL-E-5272. The assembly shall be returned to room temperature and, within 1 hour, be checked in accordance with 4.5.2. The operation point shall not differ from the nominal operation point by more than the limits specified in 3.16.

4.5.10.5 Altitude: The ice detector assembly shall be subjected to an altitude test in accordance with Procedure VI, conditions A, B, and C of MIL-E-5272. The test shall be conducted at an ambient temperature of -65° ±2°F with a dewpoint of -71° to -94°F for 4 hours. At the end of this period and while still at this temperature and pressure, the assembly shall be operated to determine whether there is malfunctioning.

4.5.10.6 Mechanical shock: The ice detector assembly shall be secured to a base of sufficient mass and installed in a shock mechanism in accordance with MIL-STD-202. Testing shall be in accordance with Procedure IV of MIL-E-5272. The ice detector assembly shall be mounted in its normal operating position and in each of 5 other positions, 90 degrees apart, obtained by rotating the assembly, in turn, on 2 mutually perpendicular horizontal axes.

4.5.10.7 Humidity: Humidity tests shall be in accordance with Procedure I of MIL-E-5272. Upon completion of this test, the assembly shall meet the test outlined in 4.5.2.