

MIL-STD-1312-3

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SUPERSEDING

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MILITARY STANDARD

FASTENER TEST METHODS

METHOD 3,

HUMIDITY



FSC 53GP

DEPARTMENT OF DEFENSE
WASHINGTON, DC 20301

Fastener Test Methods, Method 3, Humidity

MIL-STD-1312-3

1. This Military Standard is approved for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, Naval Air Engineering Center, Systems Engineering and Standardization Department (SESD), Code 93, Lakehurst, NJ 08733, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FOREWORD

This standard sets forth a standard test method to simulate a high humidity environment for testing and determining a fastener's resistance to humid conditions.

TABLE OF CONTENTS

<u>Paragraph</u>		<u>Page</u>
1.	SCOPE	1
1.1	Applicability	1
2.	REFERENCED DOCUMENTS	1
2.1	Government documents	1
2.1.1	Specifications, standards and handbooks	1
3.	DEFINITIONS	1
4.	GENERAL REQUIREMENTS	1
4.1	Test apparatus	1
4.1.1	Exposure chamber	2
4.2	Test specimen	2
5.	DETAIL REQUIREMENTS	2
5.1	Test procedures	2
5.1.1	Location of specimens	2
5.2	Operating conditions	3
5.2.1	Temperature	3
5.2.2	Humidification	3
5.3	Length of test	3
5.4	Examination of specimens	3
6.	NOTES	3
6.1	Test report	3

1. SCOPE

1.1 Applicability. This method covers a procedure for testing fasteners in a high humidity environment.

2. REFERENCED DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards and handbooks. Unless otherwise specified, the following specifications, standards and handbooks of the issue listed in the current Department of Defense Index of Specifications and Standards (DoDISS) and the supplement thereto (if applicable), form a part of this standard to the extent specified herein.

STANDARDS

MILITARY

MIL-STD-889 Dissimilar Metals

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

3. DEFINITIONS

Not applicable.

4. GENERAL REQUIREMENTS

4.1 Test apparatus. Test apparatus used in the humidity test shall include the following:

- a. Exposure chamber with racks for supporting the specimens.
- b. Water reservoir.
- c. Means for creating and maintaining humidity within the required level.
- d. Means for heating the exposure chamber and controlling its temperature.
- e. Means for cleaning the air before humidifying it.
- f. Indicative means for humidity level.
- g. Indicative means for temperature.

4.1.1 Exposure chamber. The chamber and all accessories shall be made of material such as glass, hard rubber, plastic, or suitably-coated wood that will not affect the corrosiveness of the humidity. In addition, all parts that come in contact with the test specimens shall be made of materials that will not cause galvanic or electrolytic corrosion. The chamber and accessories shall be constructed and arranged as follows:

- a. There shall be no dripping of the condensate on the specimens.
- b. The humidity atmosphere shall circulate freely about all specimens to the same degree.
- c. No condensate, which has come into contact with test specimens, shall return to the humidity cycle.
- d. The chamber shall be properly vented.

4.2 Test specimens.

4.2.1 Specimens shall be given a minimum of handling and shall be prepared for test immediately before exposure. Specimens shall be handled with clean lintless gloves.

4.2.2 Specimens shall be racked or supported in such a manner that the atmosphere will not condense and gather in recesses or other features of the fastener and will circulate freely about all specimens to the same degree.

4.2.3 Specimens shall be cleaned with detergent and rinsed with deionized water to obtain a water-break-free surface, followed by rinsing with isopropyl alcohol and air or blow drying. No halogenated solvents or abrasives of any type are permitted. Cleaning must be done within one hour of test, shall be processed with a minimum of handling and shall be handled only with clean, lintless cotton gloves after the cleaning operation.

4.2.4 Unless specified in the product specification, dissimilar materials as defined in MIL-STD-889 must not be tested in the same cabinet at the same time.

5. DETAIL REQUIREMENTS

5.1 Test procedures.

5.1.1 Location of specimens. Whenever possible, a specimen shall be supported from the bottom or the side. When specimens are suspended from the top, suspension shall be by means of nylon cord or glass hooks. The use of metal hooks is not permitted. Specimens shall be so positioned that:

- a. They do not contact each other or any metallic material or any material capable of acting as a wick.
- b. They are not shielded from condensate from the atmosphere.
- c. Corrosion products and condensate from one specimen does not fall upon another specimen or return to the humidifying reservoir.

5.2 Operating conditions.

5.2.1 Temperature. The test shall be conducted with the temperature in the exposure zone maintained at 120°F, +2°F, -3°F (49°C, +1°C, -1.7°C). Satisfactory methods for controlling the temperature accurately are by housing the apparatus in a properly controlled constant-temperature room, by thoroughly insulating the apparatus and preheating the air to the proper temperature prior to humidifying, or by jacketing the apparatus and controlling the temperature of water or of the air used in the jacket. No surface in the chamber shall become overheated enough to cause evaporation of condensate followed by condensation of that moisture on the other specimens. The use of immersion heaters within the chamber, for the purpose of maintaining the temperature within the exposure zone, is prohibited.

5.2.2 Humidification. Only distilled or deionized water shall be used in humidifying the chamber.

5.2.2.1 The conditions maintained in all parts of the exposure zone shall be 90 percent +5 percent relative humidity.

5.3 Length of test. Unless otherwise specified, the length of the humidity test shall be 96 hours. The test shall be run continuously until the time indicated or until definite indication of failure is observed, with interruptions only for adjustment of the apparatus and inspection of the specimen. Operations shall be so scheduled that interruptions are held to a minimum.

5.4 Examination of specimens. At the end of the test, the specimens shall be examined immediately to determine compliance with the standard of acceptability specified in the product specification or drawing.

6. NOTES

6.1 Test report. Unless otherwise prescribed in the product specification or drawing, for the material or product being tested, the test report shall contain the following data:

- a. Readings of humidity within the exposure zone of the chamber.

- b. Readings of temperature within the exposure zone of the chamber.
- c. Type of specimen and its dimensions, or part number, lot number, or description of part tested.
- d. Method of supporting specimens in the humidity chamber.
- e. Length of exposure period.
- f. Cause and length of interruptions during the test.
- g. Results of all inspections.
- h. Method of specimen preparation such as cleaning.
- i. Conclusions drawn from the test.
- j. Instrumentation model number, serial number, and calibration date.

NOTE: For quality assurance testing, the report shall only specify:

- a. The humidity test was conducted in accordance with Method 3.
- b. The exposure time.
- c. The results of final inspection.

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