

INCH-POUND

MIL-STD-202-110

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SUPERSEDING

MIL-STD-202G

w/CHANGE 2 (IN PART)

28 June 2013

(see 6.1)

**DEPARTMENT OF DEFENSE  
TEST METHOD STANDARD  
METHOD 110, SAND AND DUST**



AMSC N/A

FSC 59GP



MIL-STD-202-110

FOREWORD

1. This standard is approved for use by all Departments and Agencies of the Department of Defense.
2. This entire standard has been revised. This revision has resulted in many changes to the format, but the most significant one is the splitting the document into test methods. See MIL-STD-202 for the change summary.
3. Comments, suggestions, or questions on this document should be emailed to [std202@dla.mil](mailto:std202@dla.mil) or addressed to: Commander, Defense Logistics Agency, DLA Land and Maritime, ATTN: VAT, P.O. Box 3990, Columbus, OH 43218-3990. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.dla.mil>.

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MIL-STD-202-110

METHOD 110  
SAND AND DUST

1. SCOPE

1.1 Purpose. The dust test is used during the development, test, and evaluation of equipment to ascertain their ability to resist the effects of a dry dust (fine sand) laden atmosphere. This test simulates the effect of sharp edged dust (fine sand) particles, up to 150 microns in size, which may penetrate into cracks, crevices, bearings, and joints, and cause a variety of damage such as fouling moving parts, making relays inoperative, forming electrically conductive bridges with resulting "shorts" and acting as a nucleus for the collection of water vapor, and hence a source of possible corrosion and malfunction of equipment. This test is applicable to all mechanical, electrical, electronic, electrochemical, and electromechanical devices for which exposure to the effects of a dry dust (fine sand) laden atmosphere is anticipated.

2. APPLICABLE DOCUMENTS

This section not applicable to this standard.

3. DEFINITIONS

This section not applicable to this standard.

4. GENERAL REQUIREMENTS

4.1. Apparatus.

4.1.1 Test facility. The test facility shall consist of a chamber and accessories to control dust concentration, velocity, temperature, and humidity of dust-laden air. In order to provide adequate circulation of the dust laden air, no more than 50 percent of the cross-sectional area (normal to air flow) and 30 percent of the volume of the chamber shall be occupied by the test item(s). The chamber shall be provided with a suitable means of maintaining and verifying the dust concentration in circulation. A minimum acceptable means for doing this is by use of a properly calibrated smoke meter and standard light source. The dust-laden air shall be introduced into the test space in such a manner as to allow it to become approximately laminar in flow before it strikes the test item.

4.1.1.1 Dust requirements. The dust used in this test shall be a fine sand (97-99% by weight SiO<sub>2</sub>) of angular structure, and shall have the following size distribution as determined by weight, using the U.S. Standard Sieve Series.

- a. 100 percent of this dust shall pass through a 100-mesh screen.
- b. 98 ±2 percent of the dust shall pass through a 140-mesh screen.
- c. 90 ±2 percent of the dust shall pass through a 200-mesh screen.
- d. 75 ±2 percent of the dust shall pass through a 325-mesh screen.

"140-mesh silica flour" as produced by the Ottawa Silica Company, Ottawa, Illinois, or equal, is satisfactory for use in the performance of these tests.

4.2. Procedure

Place the test item in the chamber, positioned as near the center of the chamber as practicable. If more than one item is being tested, there shall be a minimum clearance of 4 inches between surfaces of test items or any other material or object capable of furnishing protection. Also, no surface of the test item shall be closer than 4 inches from any wall of the test chamber. Orient the item so as to expose the most critical or vulnerable parts to the dust stream. The test item orientation may be changed during the test if so required by the component specification.

- Step 1 - Set the chamber controls to maintain an internal chamber temperature of 23°C (73°F) and a relative humidity of less than 22 percent. Adjust the air velocity to 1,750 ±250 feet per minute. Adjust the dust feeder to control the dust concentration at 0.3 ±0.2 grams per cubic foot. With test item nonoperating, maintain these conditions for 6 hours.
- Step 2 - Stop the dust feed and reduce the air velocity to 300 ±200 feet per minute. Raise the internal chamber air temperature to 63°C (145°F) and adjust humidity control to maintain a relative humidity of less than 10 percent. Hold these conditions for 16 hours.
- Step 3 - While holding chamber temperature at 63°C (145°F) adjust the air velocity to 1,750 ±250 fpm, maintain a relative humidity of less than 10 percent. Adjust the dust feeder to control the dust concentration at 0.3 ±0.2 grams per cubic foot. With the test item nonoperating, maintain these conditions for 6 hours.
- Step 4 - Turn off all chamber controls and allow the test item to return to standard ambient conditions. Remove accumulated dust from the test item by brushing, wiping, or shaking, care being taken to avoid introduction of additional dust into the test item. Under no circumstances, shall dust be removed by either air blast or vacuum cleaning.

- NOTE:
- 1. This test specimen may be operating during either or both of the 6-hour test periods (step 1 or 3) if so required by the component specification.
  - 2. When the component specifications reference test conditions A, B, or C of the previous version of this test method, steps 1 through 4 of this test will be used unless otherwise specified.

5. DETAILED REQUIREMENTS

5.1 Summary. The following details are to be specified in the individual specification:

- a. Change in orientation during test, if required.
- b. Whether component is to operate during test and length of time required for operation and measurements.
- c. Whether the second 6-hour test at 63°C (145°F) shall be performed immediately after reaching stabilization in step 2.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Supersession data. The main body and 38 parts of this revision of MIL-STD-202 replace superseded MIL-STD-202.

Custodians:

Army - CR  
Navy - EC  
Air Force - 85  
DLA - CC

Preparing activity:  
DLA – CC

(Project 59GP-2015-014)

Review activities:

Army - AR, AT, AV, CR4, MI, SM, TE  
Navy - AS, OS, SH  
Air Force - 19, 99  
NSA - NS

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