



How to test bonds » Lead integrity » MIL-STD-883 method 2004.7 lead integrity

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1. PURPOSE

This test is designed to check device leads (or terminals) and seals for their resistance to twisting motions.

2. APPARATUS

The torque test requires suitable clamps and fixtures, and a torsion wrench or other suitable method of applying the specified torque without lead restriction.

3. PROCEDURE

The appropriate procedure of 3.1 or 3.2 for the device under test shall be used.

1. Procedure for devices with circular cross-section terminals or leads

The device body shall be rigidly held and the specified torque shall be applied for 15 seconds minimum to the lead (terminal) to be tested, without shock, about the axis of the lead (terminal).

2. Procedure for devices with rectangular cross-section terminals or leads

The device body shall be rigidly held and a torque of 1.45 ± 0.145 kg-mm (2.0 ± 0.2 ounce-inch) unless otherwise specified, shall be applied to the lead (terminal) at a distance of 3.05 ± 0.76 mm (0.12 ± 0.03 inch) from the device body or at the end of the lead if it is shorter than 3.05 mm (0.12 inch). The torque shall be applied about the axis of the lead once in each direction (clockwise and counterclockwise). When devices have leads which are formed close to the body, the torque may be applied 3.05 ± 0.76 mm (0.12 ± 0.03 inch) from the form. For device leads which twist noticeably when less than the specified torque is applied, the twist shall be continued until the twist angle reaches $30^\circ \pm 10^\circ$ or the specified torque is achieved, whichever condition occurs first. The lead shall then be restored to its original position.

3. Failure criteria

When examined using magnification between 10X and 20X after removal of the

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Bond testers

- Condor *Sigma*
- Condor *Sigma Lite*
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stress, any complete breakage (e.g. separation of the lead from the body) or loosening of the lead at the glass/ceramic seal that has caused a method 1014 seal failure shall be considered a device failure. When a seal test in accordance with method 1014 is conducted as a post test measurement following the lead integrity test(s), meniscus cracks shall not be cause for rejection of devices which pass the seal test.

4. SUMMARY

The following details shall be specified in the applicable acquisition document:

- a. Torque to be applied for circular cross-section leads ([see 3.1](#)).
- b. Duration of torque application for circular cross-section leads, if other than 15 seconds minimum ([see 3.1](#)).
- c. Torque to be applied for rectangular cross-section leads, if other than 1.45 ± 0.145 kg-mm (2.0 ± 0.2 ounce-inch) ([see 3.2](#)).
- d. See general summary above.
- e. Post test measurements, if applicable ([see 3.3](#)).

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