

METHOD 2007.3

VIBRATION, VARIABLE FREQUENCY

1. **PURPOSE.** The variable frequency vibration test is performed for the purpose of determining the effect on component parts of vibration in the specified frequency range. This is a destructive test.
2. **APPARATUS.** Apparatus for this test shall include equipment capable of providing the required variable frequency vibration at the specified levels and the necessary optical and electrical equipment for post-test measurements.
3. **PROCEDURE.** The device shall be rigidly fastened on the vibration platform and the leads or cables adequately secured. The device shall be vibrated with simple harmonic motion having either a peak to peak amplitude of 0.06 inch (± 10 percent) or a peak acceleration of the specified test condition A, B, or C (+20 percent, -0 percent g). Test conditions shall be amplitude controlled below the crossover frequency and g level controlled above. The vibration frequency shall be varied approximately logarithmically between 20 and 2,000 Hz. The entire frequency range of 20 to 2,000 Hz and return to 20 Hz shall be traversed in not less than 4 minutes. This cycle shall be performed 4 times in each of the orientations X, Y, and Z (total of 12 times), so that the motion shall be applied for a total period of not less than 48 minutes. When specified, devices with an internal cavity containing parts or elements subject to possible movement or breakage during vibration shall be further examined by radiographic examination in accordance with method 2012 or by delidding or opening and internal visual examination at 30X magnification to reveal damage or dislocation. Where this test is performed as part of a group or subgroup of tests, the post-test measurements or inspections need not be performed specifically at the conclusion of this test, but may be performed once at the conclusion of the group or subgroup.

<u>Test condition</u>	<u>Peak acceleration, g</u>
A	20
B	50
C	70

CAUTION: If this test is performed using a potting compound type test fixture (e.g., waterglass/sodium silicate) the facility performing the test shall assure that this procedure/material does not mask fine/gross leakers.

3.1 **Examination.** After completion of the test, an external visual examination of the marking shall be performed without magnification or with a viewer having a magnification no greater than 3X and a visual examination of the case, leads, or seals shall be performed at a magnification between 10X and 20X. This examination and any additional specified measurements and examination shall be made after completion of the final cycle or upon completion of a group, sequence, or subgroup of tests which include this test.

3.2 **Failure criteria.** After subjection to the test, failure of any specified measurement or examination (see 3 and 4), evidence of defects or damage to the case, leads, or seals, or illegible markings shall be considered a failure. Damage to marking caused by fixturing or handling during tests shall not be cause for device rejection.

4. **SUMMARY.** The following details shall be specified in the applicable acquisition document:
 - a. Test condition (see 3).
 - b. Measurements after test (see 3 and 3.1).