INTERNATIONAL STANDARD

ISO 13355

Second edition
2016-08-01

Packaging — Complete, filled transport packages and unit loads — Vertical random vibration test

Emballages — Emballages d'expédition complets et pleins et charges unitaires — Essais de vibration verticale aléatoire

Reference number
ISO 13355:2016(E)

© ISO 2016



COPYRIGHT PROTECTED DOCUMENT

© ISO 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

 © ISO 2016 – All rights reserved

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Principle **1**
4 Apparatus **1**
4.1 Vibration table 1
4.2 Vibration measurement, data storage and control system 2
5 Sampling **2**
5.1 Test specimen preparation 2
5.2 Conditioning 2
6 Procedure **2**
7 Test report **3**
Annex A (normative) **Power spectral density in generic transportation** **5**
Annex B (informative) **Power spectral densities derived from recorded data** **6**
Bibliography **9**

© ISO 2016 – All rights reserved

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 122, *Packaging*, Subcommittee SC 3, *Performance requirements and tests for means of packaging, packages and unit loads*.

This second edition cancels and replaces the first edition (ISO 13355:2003), which has been technically revised.

Some of the major modification points are listed as follows:

a) Annex A has been changed from Informative to Normative;

b) in Table A.1, 0,048 $(m/s^2)^2$ at 3 Hz, Slope between 3 Hz to 6 Hz, 1,154 $(m/s^2)^2$ at 6 Hz to 18 Hz has been changed to 0,048 $(m/s^2)^2$ at 2 Hz, Slope between 2 Hz to 4 Hz, 1,154 $(m/s^2)^2$ at 4 Hz to 18 Hz;

c) Annex B has been added.

© ISO 2016 – All rights reserved

Introduction

A random vibration test is a more realistic method in reproducing environmental vibration during transportation than sinusoidal vibration test. For this reason, if suitable laboratory facilities are available, a vibration test is more preferable than any fixed or swept frequency sinusoidal vibration tests similar to those given in ISO 2247 and ISO 8318.

© ISO 2016 – All rights reserved

Packaging — Complete, filled transport packages and unit loads — Vertical random vibration test

1 Scope

This International Standard specifies a method to carry out a vertical random vibration test on a complete, filled transport package(s) and unit loads using random excitation[1)]. This document also provides methods for assessing the performance of a package in terms of its strength or the protection that it offers to its contents when it is subjected to vertical vibration. The test discussed in this document can be performed either as a single test to investigate the effects of vertical vibration, or as a part of a sequence of tests designed to measure the ability of a test specimen to withstand a distribution system that includes a vibration hazard.

NOTE In this International Standard, a package or unit load is referred to as test specimen.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2206, *Packaging — Complete, filled transport packages — Identification of parts when testing*

ISO 2233, *Packaging — Complete, filled transport packages and unit loads — Conditioning for testing*

ISO 2234, *Packaging — Complete, filled transport packages and unit loads — Stacking tests using a static load*

3 Principle

The test specimen is placed on a vibration table and made to vibrate using random excitation with an effective frequency range for the test specimen. Atmospheric conditions, test duration, acceleration power spectral density, attitude of the test specimen and method of restraint are predetermined.

Specific requirements for mounting a test specimen on the vibrating platform are given in ISO 4180:2009, 10.7.1.

NOTE When required, a load is superimposed on the test specimen to simulate the conditions at the bottom of a stack.

4 Apparatus

4.1 Vibration table

A table of sufficient size and performance (in terms of power, displacement, frequency range) capable of being stiff (its lower resonant frequency shall be higher than the higher test frequency) and remaining horizontal during the test.

1) Random vibration theory is discussed in IEC 60068-2-64.

© ISO 2016 – All rights reserved