INTERNATIONAL STANDARD

ISO 2873

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Packaging — Complete, filled transport packages and unit loads — Low pressure test

Emballages — Emballages d'expédition complets et pleins et charges unitaires — Essai à basse pression

Reference number
ISO 2873:2000(E)

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 734 10 79
E-mail copyright@iso.ch
Web www.iso.ch

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 2873 was prepared by Technical Committee ISO/TC 122, *Packaging*, Subcommittee SC 3, *Performance requirements and tests for means of packaging, packages and unit loads (as required by ISO/TC 122).*

This third edition cancels and replaces the second edition (ISO 2873:1985) which has been technically revised.

Annex A of this International Standard is for information only.

Introduction

It is the responsibility of the user of this International Standard to establish appropriate health and safety practice in accordance with relevant legislation.

Packaging — Complete, filled transport packages and unit loads — Low pressure test

1 Scope

This International Standard specifies a method for subjecting complete, filled transport packages and unit loads to conditions of low air pressure similar to those encountered in aircraft.

This method is applicable to complete, filled transport packages and unit loads which are intended to be transported in pressurized aircraft flying at any altitude and in unpressurized aircraft flying at 3 500 m or less.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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*.

3 Term and definition

For the purposes of this International Standard, the following term and definition applies.

3.1
test item
a complete filled transport package or unit load

4 Principle

The test item is placed in a pressure chamber, and the pressure in the chamber reduced to that corresponding to an altitude of 3 500 m. This pressure is approximately equal to that in pressurized aircraft flying at any higher altitude. The pressure is then held for a predetermined period after which it is permitted to return to ambient pressure.

NOTE While the pressure is held for the predetermined period, the temperature may also be maintained to that corresponding to the same altitude (see annex A, Table A.1).

5 Apparatus

5.1 Pressure vessel, of sufficient size to accommodate the test item, with pressure and temperature controls to meet the requirements of the procedure in clause 8.

6 Test item preparation

Fill the test item with its intended contents and ensure that the test item is closed normally, as if ready for distribution.

NOTE Simulated or substitute contents may be used on condition that the dimensions and physical properties of such contents are as close as possible to those of the intended contents. However, the closure should be the same as for distribution.

7 Conditioning

The test item shall be conditioned in accordance with one of the conditions described in ISO 2233.

8 Procedure

8.1 Place the test item in the pressure vessel (see clause 5) and reduce the pressure at a rate not exceeding 150 mbar/min, until it reaches 650 mbar (± 5 %). Maintain this pressure for the predetermined period.

NOTE 1 mbar = 1 hPa = 0,1 kPa

8.2 Restore the pressure by allowing dry air at laboratory temperature to enter at such a rate that the increase in pressure does not exceed 150 mbar/min.

NOTE If it is desired to study the effects of temperature as well as pressure in pressurized aircraft, the atmosphere in the vessel should be maintained at (–8 ± 1) °C during the predetermined period.

9 Test report

The test report shall include:

a) a reference to this International Standard;

b) the name and address of testing laboratory and name and address of customer;

c) the unique identification of the report;

d) the date of receipt of the test items and the date(s) of performance of the test;

e) the name, title and signature of persons accepting test responsibility for the test report;

f) a statement to the effect that the test results relate only to the items tested;

g) a statement that the report shall not be reproduced, except in full, without the written approval of the testing laboratory;

h) the number of replicate test items tested;

i) a full description, including dimensions, structural and material specifications of the test item and its fittings, cushioning, blocking, closure and reinforcing arrangements, gross mass of the test item and the mass of the contents in kilograms;

j) the description of contents, if simulated or substituted contents were used, full details shall be given;

k) the relative humidity, temperature and time of conditioning; the temperature and relative humidity of the test area at the time of test; whether these values comply with the requirements of ISO 2233;

l) the attitudes in which the test item was tested, using the method of identification given in ISO 2206;

m) the temperature and pressure inside the pressure vessel, and the time for which they were maintained;

n) any deviation from the test method described in this International Standard;

o) a record of the result, including any observations which assist in the correct interpretation of the results.

Annex A
(informative)

Atmospheric conditions

The temperature in the holds of pressurized aircraft rarely falls below 0 °C. However the temperature of packages and unit loads on loading into the aircraft will depend on the ambient temperature experienced prior to loading as well as the subsequent ambient temperature experienced in the hold prior to take off. These effects will persist for some time during flight.

The same ambient temperatures can also affect the temperatures of packages and unit loads in unpressurized aircraft. When these aircraft fly above 3 500 m the pressure will drop to the values given in Table A.1, and the temperature of the packages and unit loads will be affected to some extent by outside air temperature at these altitudes depending on the length of the flight and the time/altitude profile of the flight.

Table A.1 — Conditions of the external atmosphere

Altitude m	**Pressure** mbar or hPa	**Temperature** °C
4 000	615	–11
6 000	470	–24
8 000	355	–37
10 000	265	–50
12 000	190	–56,5
15 000	120	–56,5
18 000	75	–56,5
20 000	55	–56,5
NOTE Values taken from the Air Transport Association (ATA).		

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