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Indian Standard

PERFORMANCE TESTS FOR
COMPLETE, FILLED TRANSPORT PACKAGES

PART 5 ROLLING TEST

(*First Revision*)

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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Indian Standard

PERFORMANCE TESTS FOR COMPLETE, FILLED TRANSPORT PACKAGES

PART 5 ROLLING TEST

(*First Revision*)

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Indian Standard

PERFORMANCE TESTS FOR COMPLETE, FILLED TRANSPORT PACKAGES

PART 5 ROLLING TEST

(First Revision)

0. FOREWORD

0.1 This Indian Standard (Part 5) (First Revision) was adopted by the Bureau of Indian Standards on 28 April 1987, after the draft finalized by the Transport Packages Sectional Committee had been approved by the Marine, Cargo Movement and Packaging Division Council.

0.2 This standard, first published in 1973, has been revised in order to bring it in line with the ISO 2876-1985 'Packaging — Complete; filled transport Packages — Rolling test' issued by the International Organization for Standardization (ISO). In this revision, toppling test has been recommended in some situations, and information on 'package preparation' and 'inspection' has been added.

0.3 Packages intended for transport of goods are required to fulfil the primary function of physical protection to the contents. The packages are transported normally by road, rail, sea and air, as also inland water-ways either by one or a combination of these modes. The nature of the hazards that are confronted during transport is widely varying depending upon the distribution system, handling methods and skills of staff employed. Performance tests are developed for complete, filled transport packages with a view to enabling one to determine in advance as to how a package would fare in a given distribution system.

0.4 Transport packages, particularly parallelepipedal packages, are often rolled on its faces in order to move them through short distances in store houses or in distribution systems. The rolling test, therefore, is performed for testing the strength of the transport package and the protection that it offers to its contents when the package confronts the hazard of rolling.

0.5 The actual requirements for severity level and criteria of conformity of the performance tests shall be included in the specifications for individual packages. Also the standard range of intensities of tests and criterion of acceptance will be covered in a separate standard.

1. SCOPE

1.1 This standard (Part 5) specifies a method of making rolling tests on a complete, filled transport package. It may be performed either as a single test to investigate the effects of rolling or as part of a sequence of tests designed to measure the ability of a package to withstand a distribution system that includes a rolling hazard.

NOTE— A toppling test may be more suitable for packages which are tall in relation to their base dimensions, or the height of which is small by comparison with base dimensions but which may be stored or transported resting on a side face. The toppling test is recommended for packages where the ratio of the longest to the shortest sides is of the order of 3 : 1 or greater. A method of carrying out a toppling test on a complete, filled transport package is under preparation.

2. PRINCIPLE

2.1 Rolling of the test package so as to impact on each face in turn.

3. APPARATUS

3.1 Impact Surface— Horizontal and flat, massive enough to be immovable and rigid enough to be non-deformable under test conditions.

3.1.1 In normal circumstances the impact surface provided shall be:

- a) integral with a mass at least 50 times that of the heaviest package to be tested;
- b) flat, such that no two points on its surface differ by more than 2 mm; however, where one of the dimensions of the test package in contact with the surface is greater than 1 000 mm, a maximum difference in surface level of 5 mm will be acceptable;
- c) rigid, such that it will not be deformed by more than 0.1 mm when an area of 100 mm² is loaded statically with 10 kg anywhere on the surface; and
- d) sufficiently large to ensure that the test package falls entirely upon the surface.

4. PACKAGE PREPARATION

4.1 The test package shall normally be filled with its intended contents. However, simulated or dummy contents may be used on condition that the dimensions and physical properties of such contents shall be as close as possible to those of the intended contents.

4.1.1 Ensure that the test package is closed normally, as if ready for distribution. If simulated or dummy contents are used, ensure that the normal method of closure is still employed.

5. CONDITIONING

5.1 The package shall be conditioned in accordance with one of the conditionings described in IS : 7031-1987*.

6. PROCEDURE

6.0 Wherever possible, the test shall be carried out in the same atmospheric conditions as used for conditioning, where this is critical to the materials or application of the package. In other circumstances, the test shall be carried out in atmospheric conditions which are as near as practicable to those used for conditioning.

6.1 Parallelepipedal Packages — Define the panels and edges of the package using the requirements given in IS : 7030-1973†.

6.1.1 Place the package on the impact (*see 3*) with surface 1 uppermost.

6.1.2 Tilt the package by hand with the edge 3-4 resting on the impact surface until the point of balance on this edge is reached. Then permit it to overbalance without thrust so as to impact on surface 4.

6.1.3 Repeat this procedure until the sequence given in Table 1 is completed.

6.2 Packages of Other Shapes — The procedure shall be as close to that described in 6.1 as is possible.

6.3 Inspection — On completion of the test sequence, the test package and its contents shall be examined for damage.

*Method of conditioning of complete, filled transport packages (*first revision*).

†Method of identification of parts for complete, filled transport packages.

TABLE 1 SEQUENCE OF SURFACE DROPS

(Clause 6.1.3)

BALANCE ON EDGE	IMPACT ON SURFACE
3—4	4
4—1	1
1—2	2
2—3	3
3—6	6
6—1	1
1—5	5
5—3	3

NOTE — If the dimensions of one surface are small it will sometimes occur that two of the above impacts will occur consecutively after one release. In such instances the test will proceed as though each of the impact had occurred separately.

7. TEST REPORT

7.1 The test report shall include the following particulars:

- a) Reference to this standard;
- b) Number of replicate packages tested;
- c) Full description of the package, including dimensions, structural and material specifications of the package and its fitting, cushioning, blocking, closure or reinforcing arrangements;
- d) Description of contents if simulated or dummy contents were used full details shall be given;
- e) Gross mass of package, and mass of contents, in kilograms;
- f) Relative humidity, temperature and time of conditioning, temperature and relative humidity of test area at time of test, whether these values comply with the requirements of IS : 7031-1987*;
- g) Any deviations from the test method described in this standard;
- h) A record of the result, with any observations which may assist in correct interpretation;
- j) Date of the test; and
- k) Signature of tester.

*Method of conditioning of complete, filled transport packages (*first revision*).

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