



SLOVENSKI STANDARD

SIST ISO 4180-2:1996

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Nadomešča:

SIST EN 24180-2:1996

Embalaža - Celovita, napolnjena transportna embalaža - Splošna pravila za določanje programa preskusov o primernosti za uporabo - 2. del: Kvantitativni podatki

Complete, filled transport packages -- General rules for the compilation of performance test schedules -- Part 2: Quantitative data

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Emballages d'expédition complets et pleins -- Règles générales pour l'établissement des programmes d'essais d'aptitude à l'emploi -- Partie 2: Données quantitatives

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ICS:

55.180.40	Celovita, napolnjena transportna embalaža	Complete, filled transport packages
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International Standard



4180/2

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Complete, filled transport packages — General rules for the compilation of performance test schedules — Part 2 : Quantitative data

Emballages d'expédition complets et pleins — Règles générales pour l'établissement des programmes d'essais d'aptitude à l'emploi — Partie 2 : Données quantitatives

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4180/2 was developed by Technical Committee ISO/TC 122, *Packaging*, and was circulated to the member bodies in March 1979.

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It has been approved by the member bodies of the following countries :

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Australia	France	New Zealand
Austria	Germany, F.R.	Poland
Belgium	Hungary	Romania
Brazil	India	South Africa, Rep. of
Bulgaria	Ireland	Spain
Canada	Israel	Turkey
Chile	Japan	United Kingdom
Czechoslovakia	Libyan Arab Jamahiriya	USA
Denmark	Malaysia	USSR
Egypt, Arab Rep. of	Netherlands	Yugoslavia

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Italy
Sweden

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Complete, filled transport packages — General rules for the compilation of performance test schedules — Part 2 : Quantitative data

0 Introduction

This International Standard has been prepared in order to fulfil a need of organizations concerned with the compilation of test schedules for complete, filled transport packages.

Such test schedules can be as diverse as the journeys that packages undergo. Accordingly, this International Standard is intended to set guidelines for the compilation of appropriate test schedules, rather than to provide a rigid framework or to be specified by regulatory or other authorities.

It is expected that, once compiled, a particular test schedule, including the test methods and intensities to be applied, could be the subject of International Standards or would become a matter for agreement between the parties concerned, for example the package designer, the manufacturer of the contents, the transport authority, the customer, the statutory regulating body or any combination of them.

1 Scope and field of application

This International Standard establishes general rules to be used for the compilation of performance test schedules for complete, filled transport packages intended for use within any distribution system, whether transported by road, rail, sea, air or inland waterway, or by a combination of these modes of transport.

ISO 4180/1 states the general principles entailed in compiling test schedules.

It also gives the factors to be considered in assessing the criteria of acceptance of such packages after they have been subjected to a package performance test schedule.

This part incorporates all the quantitative data necessary to establish test intensities and other quantitative features of test schedules.

The two parts are intended to be read in conjunction with one another.

2 References

ISO 2206, *Packaging — Complete, filled transport packages — Part 1 : Identification of parts when testing.*

ISO 2233, *Packaging — Complete, filled transport packages — Part 2 : Conditioning for testing.*

ISO 2234, *Packaging — Complete, filled transport packages — Part 3 : Stacking test.*

ISO 2244, *Packaging — Complete, filled transport packages — Part 5 : Horizontal impact tests (inclined plane test; pendulum test).*

ISO 2247, *Packaging — Complete, filled transport packages — Part 6 : Vibration test.*

ISO 2248, *Packaging — Complete, filled transport packages — Part 4 : Vertical impact test by dropping.*

ISO 2872, *Packaging — Complete, filled transport packages — Part 7 : Compression test.*

ISO 2873, *Packaging — Complete, filled transport packages — Part 8 : Low pressure test.*

ISO 2874, *Packaging — Complete, filled transport packages — Part 9 : Stacking test using compression tester.*

ISO 2875, *Packaging — Complete, filled transport packages — Part 10 : Water spray test.*

ISO 2876, *Packaging — Complete, filled transport packages — Part 11 : Rolling test.*

ISO 4180/1, *Complete, filled transport packages — General rules for the compilation of performance test schedules — Part 1 : General principles.*

ISO 4180/2-1980 (E)

3 Factors requiring quantification in test methods

Relevant test methods, and the factors requiring quantification before each test can be used, are given in table 1.

4 Preferred values of test intensities

Basic test intensities, which are considered to be normal for a common distribution system and which are based upon a

package of "average" mass and size (i.e. of mass 20 kg and dimensions 400 mm × 400 mm × 400 mm) are given in table 2, for the road, rail, water and air modes of transport and for storage.

Where a test intensity other than the basic value is appropriate (see clause 5) the value selected should be chosen, as far as is practicable, from the preferred values given in table 3.

For comparative investigations or research it may be necessary to select values of test intensity other than those given in table 3.

Table 1 — Methods of test and factors requiring quantification

Method of test	Relevant International Standard	Factors requiring quantification
Conditioning	ISO 2233	Temperature, relative humidity, time, pre-drying conditions (if any).
Stacking test	ISO 2234	Load, duration of time under load, attitude(s) of the package(s) ¹⁾ , atmospheric temperature and relative humidity, number of replicate packages.
Vertical impact test by dropping	ISO 2248	Drop height, attitude(s) of the package(s) ¹⁾ , atmospheric temperature and relative humidity, number of replicate packages, number of impacts.
Horizontal impact tests (inclined plane test, pendulum test)	ISO 2244	Horizontal velocity, attitude(s) of the package(s) ¹⁾ , atmospheric temperature and relative humidity, profiles of impacting surfaces and use (if any) of an interposed hazard, number of replicate packages.
Vibration test	ISO 2247	Duration of test, attitude(s) of the package(s) ¹⁾ , atmospheric temperature and relative humidity, load (if any) superimposed on the package(s), number of replicate packages.
Compression test	ISO 2872	Maximum load (where applicable), attitude(s) of the package(s) ¹⁾ , atmospheric temperature and relative humidity, upper platen rigidly mounted or free to tilt, number of replicate packages.
Low pressure test	ISO 2873	Pressure, duration of time at reduced pressure, temperature within test chamber, number of replicate packages.
Stacking test using compression tester	ISO 2874	Load applied, duration of time under load, attitude(s) of the package(s) ¹⁾ , atmospheric temperature and relative humidity, number of replicate packages.
Water spray test	ISO 2875	Duration of time under spray, attitude(s) of the package(s) ¹⁾ , number of replicate packages.
Rolling test	ISO 2876	Atmospheric temperature and relative humidity, number of replicate packages.

1) See ISO 2206.

Table 2 — Basic test intensities

Method of test	Variable	Units	Transport mode														
			Road			Rail			Water			Air			Storage		
			Basic value	Range	Basic value	Range	Basic value	Range	Basic value	Range	Basic value	Range	Basic value	Range	Basic value	Range	
Tests imposed by equipment installation and environment Climatic ¹⁾	Rain																
	Temperature Relative humidity Low pressure																
Vibration	Duration	min	20	10 to 60	20	10 to 60	Short : 20 Long : 60	10 to 60	10 to 60	Under study	Under study	Under study	Under study				
	Height of stack, if loaded	m	2,50	1,50 to 3,50	2,50	1,50 to 2,50	3,50	3,50 to 7,00	3,50 to 7,00								
Stacking	Duration	As given	1 day	1 day to 1 week	1 day	1 day to 1 week	Short : 1 day Long : 1 week	1 day to 4 weeks	1 day to 4 weeks	1 day	1 day	1 day	1 day	Short : 1 day Long : 1 week	1 day to 4 weeks	1,50 to 7,00	
	Height	m	2,50	1,50 to 3,50	2,50	1,50 to 2,50	3,50	3,50 to 7,00	3,50 to 7,00								
Horizontal impact	Velocity	m/s	1,5	1,5 to 2,7	1,8	1,3 to 5,0	—	—	—	—	—	—	—	—	—	—	—
Test imposed by manpower Vertical impact	Drop height	mm	500	100 to 1 200	500	100 to 1 200	300	100 to 1 200	100 to 1 200	500	100 to 1 200	500	100 to 1 200	—	—	—	—

1) Appropriate methods of test will be the subjects of future International Standards.

Table 3 — Preferred range of test intensities

Method of test	Relevant International Standard	Variable	Preferred range of test intensities	
			Applicable to normal hazards	Applicable to unusual or particular hazards
Stacking	ISO 2234	Load by a combination of :	1,50 — 1,80 — 2,50 — 3,50 — 5,00 — 7,00 m 1) identical packages : the density of the package under test. 2) for assorted packages : 0,25 — 0,35 — 0,5 — 0,7 — 1,0 — 1,4 — 2,0 Mg/m ³ 1 — 2 — 3 days; 1 — 2 — 3 — 4 weeks.	Range commencing at 9,00 m and continuing at 2 m intervals.
		a) height of stack;		As for normal range of hazards.
		b) density of stack.		As for normal range of hazards.
		Duration under load		Range commencing at 8 weeks and continuing at 4 week intervals.
Horizontal impact	ISO 2244	Horizontal velocity	1,5 — 1,8 — 2,2 — 2,7 — 3,3 — 4,0 — 5,0 m/s	As for normal range of hazards.
Vertical impact	ISO 2248	Drop height	100 — 150 — 200 — 300 — 400 — 500 — 600 — 800 — 1 000 — 1 200 mm	Range commencing at 1 500 mm and continuing at 300 mm intervals.
Vibration	ISO 2247	Duration of test	10 — 20 — 40 — 60 min.	Range commencing at 2 h and continuing at 1 h intervals.
		Height of stack from which superimposed loads are derived	1,50 — 1,80 — 2,50 — 3,50 m	As for normal range of hazards.

5 Test intensity modifying factors

known features of the distribution system or of the package, are given in table 4.

5.1 General

Guidelines for modifying basic values of test intensity, due to

The special circumstances introduced by palletization and by the use of freight containers are outlined in 5.2.

Table 4 – Test intensity modifying factors

Test variable	Transport mode	Modification of test intensity
Stacking height	Road	<p>a) Vehicle height : For road transport the basic stacking height of 2,50 m may be increased to 3,50 m when it is known that vehicles permitting such stacking heights may be used.</p> <p>b) Mass and size of package : The size and mass of the packages constituting the stack may introduce a limiting factor to the stack height and lead to a stack height of less than 2,50 m due to the floor loading and axle loading capabilities of the vehicles.</p>
	Rail	<p>a) Vehicle height : For rail transport the basic stacking height of 2,50 m will also be the maximum.</p> <p>b) Mass and size of package : The size and mass of the packages constituting the stack may introduce a limiting factor to the stack height and lead to a stack height of less than 2,50 m due to the floor loading capabilities of the vehicles.</p>
	Water	<p>a) Vehicle height : For water transport the basic stacking height of 3,50 m may be increased to 5,00 m or 7,00 m when it is known that vessels permitting such stacking heights may be used.</p> <p>b) Mass and size of package : The size and mass of the packages constituting the stack may introduce a limiting factor to the stack height and lead to a stack height of less than 3,50 m due to the floor loading capabilities of the decks.</p>
	Air	Not applicable.
	Storage	Warehouses : Greater stacking heights (5,00 m, 7,00 m, or higher) may be applied when it is known that such heights may be used.
	Freight containers and pallets	(See 5.2.)
Stacking duration	Road Rail Water Air Storage	Known conditions : Variation from the times given in table 2 may be made against known facts relating to the distribution system.
Vibration duration	NOTE – The effects of vibration testing will usually be manifest within the normal duration. It is desirable to extend the duration of the vibration test whilst significant changes in the package or contents can be detected.	
	Road	<p>a) Journey length : For road journeys between 1 000 and 1 500 km in length, the vibration duration should be 40 min and for journeys longer than 1 500 km the duration should be 60 min. For journeys of less than 1 h a duration of 10 min should be used.</p> <p>b) Rough journeys : For known journeys over bad roads, where poor vehicles are used or where the journey is known to be severe in some other way, the distances quoted in a) should be halved before a decision is made concerning the duration of vibration.</p>