
International Standard



4178

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Complete, filled transport packages — Distribution trials — Information to be recorded

Emballages d'expédition complets et pleins — Essais relatifs au système de distribution — Informations à noter

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Foreword

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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 4178 was developed by Technical Committee ISO/TC 122, *Packaging*, and was circulated to the member bodies in March 1979.

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

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

No member body expressed disapproval of the document.

Complete, filled transport packages — Distribution trials — Information to be recorded

0 Introduction

The relationship between the hazards encountered by complete, filled transport packages in a distribution system and the resulting damage that may be sustained by the packages and/or their contents is important in the development of new test methods, in refining existing test methods, and in the preparation of appropriate test schedules.

The study of such relationships is facilitated if, when carrying out distribution trials involving complete, filled transport packages, adequate information is recorded and if such information is recorded on a uniform basis. This enables proper comparisons to be made of data obtained at different times and under various circumstances.

The purpose of this International Standard is to aid such comparisons by specifying the information to be recorded. Its contents are likely to be of interest to all concerned with distribution trials involving complete, filled transport packages.

1 Scope and field of application

This International Standard specifies the information to be recorded when carrying out distribution trials involving complete, filled transport packages. It is applicable to distribution systems in which the hazards of stacking, vertical impact, horizontal impact, and vibration are encountered or are likely to be encountered.

2 Information to be recorded

The following information shall be recorded in the order given. Where possible, results shall be set out in the form of a table.

2.1 Description of trial

A brief description of the trial shall be given, including :

- a) the purpose of the trial;
- b) a brief description of the package(s) used;
- c) the starting point and destination of the package(s), if a journey was involved;
- d) a description of the operations carried out on the package(s), and the order in which they were carried out;

- e) the time intervals between the various operations carried out on the package(s);
- f) the duration of each of the various operations carried out on packages;
- g) the modes of transport, if any, involved at each stage of the trial.

2.2 Results of trial

The results of the trial shall be given and may be quoted in terms of the reduction in quality of the package and/or its contents, by the extent of loss of package contents, by the extent of damage to the package and/or its contents, or in terms of measurements made on the package and/or the contents. Preferably, the results shall be in such terms that changes in the factors under investigation in the trial can be correctly assigned to the operations and hazards in the distribution system that produce them.

2.3 Package

A description of each package shall be given, including :

- a) mass, in kilograms;
- b) dimensions (actual), in millimetres;
- c) the nature of the packaging, including fittings and method of sealing;
- d) the contents;
- e) the marking of the package;
- f) the handling aids attached or available for use.

2.4 Hazards in trial

Climatic conditions at each operation or hazard in the trial shall be recorded, preferably by means of a continuous recorder.

Where necessary, operations involving the same hazard shall be recorded separately.

Information shall be recorded for each type of hazard as follows.

2.4.1 Stacking

The following information shall be recorded for each stage in the trial at which packages were stacked :

- a) the number of packages stacked;
- b) the number of packages on which no load was superimposed;
- c) the attitude of each package;
- d) the height of the stack and, if the packages in the stack were assorted, the average density of the stack;
- e) the nature of the upper and lower loading surfaces;
- f) the duration of loading of packages, preferably in the form of a cumulative frequency curve;
- g) the stacking pattern, if the packages in the stack were identical;
- h) how measurements were carried out.

2.4.2 Vertical impact

The following information shall be recorded for each stage in the trial at which packages sustained vertical impact :

- a) the number of packages observed or measured;
- b) the number of packages which sustained no drop;
- c) the attitude of the packages;
- d) the drop heights, preferably in the form of a cumulative frequency distribution of drop height but, if this is not possible, the 5 and 50 and 95 % ile points shall be recorded whenever possible;
- e) the number of drops;
- f) the nature of the impact surfaces;
- g) how measurements were carried out;
- h) the time intervals between drops, if more than one drop per package was involved.

Where applicable the following information shall also be recorded :

- j) the vehicle or craft involved;
- k) the degree of loading of the vehicle;
- l) the positions in the vehicle at which measurements were made;
- m) the route and type of terrain (or sea or air conditions).

2.4.3 Horizontal impact

The following information shall be recorded for each stage in the trial at which packages sustained horizontal impact :

- a) the number of packages observed or measured;
- b) the number of packages which sustained no impact;
- c) the attitude of the packages;
- d) the form of the cumulative frequency distribution for velocity of impact, but if this is not possible, the 5 and 50 and 95 % ile points shall be recorded for 1 to n impacts on an individual package;
- e) the number of impacts;
- f) the nature of the impact surfaces;
- g) how measurements were carried out;
- h) the time interval between impacts, if the trial comprises several operations involving horizontal impact.

Where applicable, the following information shall also be recorded :

- j) the vehicle or craft involved;
- k) the degree of loading of the vehicle;
- l) the positions in the vehicle at which measurements were made;
- m) the route and type of terrain (or sea or air conditions).

2.4.4 Vibration

The following information shall be recorded for each stage in the trial at which packages were vibrated :

- a) the number of packages on which measurements were made;
- b) the attitude of the packages;
- c) the vibration frequency and amplitude. If there was more than one vibration frequency or amplitude, the distribution curve shall be given;
- d) the duration of vibration;
- e) the magnitude of the superimposed load, if any, in kilograms;
- f) how measurements were carried out and the records analysed.

Where applicable, the following information shall also be recorded :

- g) the vehicle or craft involved;

- h) the degree of loading of the vehicle;
- j) the positions in the vehicle at which measurements were made;
- k) the route and type of terrain (or sea or air conditions).

2.5 General information

The following general information shall also be recorded :

- a) organization(s) and individuals concerned in the trial and in the analysis of the results;
- b) any other relevant information.

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