
Obremenitev pri transportu - Merjenje in vrednotenje klimatskih in drugih obremenitev - Pridobivanje podatkov in splošne zahteve za merilno opremo

Transportation loads - Measurement and evaluation of climatic and other loads - Data acquisition and general requirements for measuring equipment

Transportbelastungen - Messen und Auswerten von klimatischen und sonstigen Belastungen - Datenerfassung und allgemeine Anforderungen an Messeinrichtungen

Charges de transport - Mesurage et évaluation des contraintes climatiques et d'autres contraintes - Acquisition de données et exigences générales relatives aux appareils de mesure

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EUROPEAN STANDARD

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English Version

Transportation loads - Measurement and evaluation of climatic and other loads - Data acquisition and general requirements for measuring equipment

Charges de transport - Mesurage et évaluation des contraintes climatiques et d'autres contraintes - Acquisition de données et exigences générales relatives aux appareils de mesure

Transportbelastungen - Messen und Auswerten von klimatischen und sonstigen Belastungen - Datenerfassung und allgemeine Anforderungen an Messeinrichtungen

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 16210:2013) has been prepared by Technical Committee CEN/TC 261 “Packaging”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2013, and conflicting national standards shall be withdrawn at the latest by September 2013.

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Introduction

This document was originally prepared by the Packaging Standards Committee (NAVp), NA 115-01-04 AA "Requirements and Testing" of the German Standardisation Institute (DIN). It is part of a complete normative concept to acquire and describe climatic and other loads, which can occur and affect goods during transport, handling and storage.

This standard obtains a significant meaning in order to fulfil the requirements of the European Directive on Packaging and Packaging Waste (Directive 94/62/EC dated 20th December 1994). These requirements ask for avoidance or reduction of packaging waste, and that the required amount of packaging material be tuned to the expected transportation load, in order to protect the transported item adequately. However, this presumes some knowledge of the climatic and other loads which occur during shipment.

At present, basic standards which describe and characterise in adequate form the magnitude of the transportation loads, based on scientifically confirmed values do not exist in the national and international world of standards. The reasons for this are mainly the absence of published data, insufficient description of the measurements, or restrictions on the dissemination of this information.

With this document, it will be possible to measure and analyse climatic and other transportation loads, thus allowing standardised and adequately documented load values to be produced.

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1 Scope

This European Standard specifies the documentation of measurements for climatic and other loads (such as sunlight, sand, dust and electromagnetic radiation) during transport, handling and storage.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

data acquisition

acquisition of raw data by measuring the load-time function with the aid of measuring equipment

2.2

measuring equipment

recording device, consisting at least of a sensor, signal conditioner, data recorder and data storing device

2.3

measuring report

documentation covering all details acquired during the data acquisition

3 General

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Table 1 shows climatic and other loads that can occur on various transported items during transport.

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Table 1 — Transported items subjected to climatic and other loads

Types of loads which can occur with corresponding modes of transports											
Mode of transport/ storage	Nature of load										
	Heat	Cold	Humidity	Condensation	Rain	Snow/ice	Salt fog	Sand/dust	Corrosive gas	Low pressure	Solar radiation
Land transport ^a , open load platform	1	1	1	1	1	1	1	1	1	2	1
Land transport ^a , closed load platform	1	1	1	1	3	3	3	3	3	2	3
Container transport, open sea, on deck	1	1	1	1	1	2	2	3	3	3	1
Container transport, open sea, below deck	1	1	1	1	3	3	2	3	3	3	3
Air transport with pressure compensation	3	3	3	3	3	3	3	3	3	3	3
Air transport without pressure compensation	1	1	1	1	3	3	3	3	3	1	3
Storage in non-air-conditioned building	1	1	1	1	3	3	3	3	2	2	3
Storage covered	1	1	1	1	2	2	1	1	1	2	3
Storage in open-air	1	1	1	1	1	1	1	1	1	2	1
1 relevant 2 conditionally relevant 3 non-relevant											
The combined transport is to be arranged by selecting the types of loads relevant to the individual modes of transport.											
^a Land transport involves trucks, trains and containers.											

The following blank forms of measuring reports attached to each annex may be copied and used for measuring purposes:

- Annex A: Road transportation;
- Annex B: In-plant transportation (including storage and handling);
- Annex C: Rail transportation;
- Annex D: Sea transportation;
- Annex E: Combined transportation;
- Annex F: Air transportation (to be developed).

4 Measuring climatic and other transportation loads

4.1 General

Measurements shall be performed in the cargo compartment (e.g. container) in which the goods are being transported and as near as possible to the transported goods. The exact location of the measuring point shall be specified (see Figures A.1 and C.1).

Climatic and other loads shall, whenever possible, be captured and recorded in an unbiased form as source data, i.e. without immediate processing.

Measuring systems and their specific parameters (e.g. frequency of measurements) shall be selected in such a way that the acquired data can be analysed universally and reused at any other time.

A deliberate containment of the measurement to a smaller measuring range than one which is possible with a technical justifiable effort, leads to faulty analysis and conclusions in certain cases and is therefore not permissible.

The measuring system shall comply with the technical state of the art, the relevant specifications and technical rules (e.g. regarding calibration) and shall comply with the measuring task.

All significant circumstances and technical parameters of the measurement shall be recorded in a measuring report. Derivations from the measuring report shall be justified.

NOTE Occasionally, after measurements have been performed, it is necessary to retrace the conditions which occurred during the data acquisition. Therefore, only a complete description of the measuring process, as required by the measuring report, enables the inspection and interpretation of the measurements. Otherwise, the acquired measured data can become invalid. In addition, apparently unimportant information (e.g. detailed description of the cargo hold and possible supply of cooling air) used for the measurement can be of great importance for later interpretation of the measured data.

4.2 Preparation of the measurement

In order to keep expensive and time consuming test-drives to a minimum, careful planning of the measurements is an absolute necessity. Here especially, the ratio between cost and profit shall be taken into account and the total costs of a measuring programme shall be compared with the possible costs which insufficient data acquisition can cause. During the planning stage of the measurement, various aspects shall be considered, in particular:

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- intended utilisation of the data;
- selection and number of sensors;
- measuring ranges and measuring intervals of the temperature and humidity measurement equipment;
- number of measuring points and their spatial distribution;
- selection of the transportation route and required measuring time;
- consideration and estimation of possible error sources.

4.3 Execution of measurement

Depending on the conceptual differences of the various means of transport, the measuring report of that particular means of transport shall be completed, as follows:

- road transport (Annex A);
- in-plant transport (including storage and handling) (Annex B);
- rail transport (Annex C);
- sea transport (Annex D);
- combined transport (Annex E);
- air transport (to be developed).

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NOTE The measuring report is set up in the form of a questionnaire in order to achieve uninterrupted, uniform and comparable data.

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Annex A (normative)

Road transportation (blank form of measuring report)

NOTE The user of this measuring report is given permission to copy this document.

A.1 Data acquisition

The following statements shall be completed as far as possible prior to or during the measurement. To capture the measuring data, automatic recording instruments ("Black Box") should be used. These instruments can be mounted inside or outside the package in order not to obstruct the transportation or storage of the package.

A.2 General Information

A.2.1 Name and address of the institution performing the measurements

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A.2.2 Name of the test manager and other persons present during the measurements

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A.2.3 Date (beginning) and duration (end) of measurement

A.2.4 Test circuit (transportation route)

A.3 Data on transportation vehicle

A.3.1 Technical description of transportation vehicle

A.3.1.1 Vehicle category (e.g. commercial vehicle, general purpose goods vehicle, goods trailer, road train, articulated vehicle, refrigerated truck)

A.3.1.2 Vehicle manufacturer and type designation according to the manufacturer

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A.3.1.3 Vehicle identification number

.....

A.3.1.4 Vehicle registration number, country of origin

.....

A.3.1.5 Manufacturer of: vehicle body, articulated vehicle, trailer

.....

A.3.1.6 Vehicle dead weight

.....

A.3.1.7 Permissible total vehicle weight

.....

A.3.1.8 Permissible payload and payload-volume

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A.3.1.9 Vehicle body design (e.g. cargo platform of metal/wood, tarpaulin, or for containers)

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.....

A.3.1.10 Vehicle particularities (e.g. refrigeration facilities, year of manufacture)

.....

A.3.1.11 Further relevant information concerning the test vehicle

.....

NOTE As a rule, the information can be gathered from the vehicle registration papers. It is advantageous to add photos of the vehicle to the measuring report.

A.3.2 Description of actual vehicle condition

A.3.2.1 Loading condition (e.g. packed/unpacked, stapled, palletised, cargo restraint with wood, flooring)

.....

A.3.2.2 Load (amount, description of it)

.....