SLOVENSKI STANDARD
oSIST prEN 17321:2019

01-januar-2019

Intermodalne nakladalne enote in gospodarska vozila - Transportna stabilnost tovorov - Minimalne zahteve in preskusi

Intermodal loading units and commercial vehicles - Transport stability of packages - Minimum requirements and tests

Intermodale Ladeeinheiten und Nutzfahrzeuge - Transportstabilität von Packstücken - Mindestanforderungen und Prüfungen

Unités de chargement intermodales et véhicules utilitaires - Stabilité au transport des colis - Exigences minimales et essais

Ta slovenski standard je istoveten z: **prEN 17321**

ICS:

55.180.01	Distribucija blaga s prevozom na splošno	Freight distribution of goods in general

oSIST prEN 17321:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 17321

November 2018

ICS 55.180.01

English Version

Intermodal loading units and commercial vehicles - Transport stability of packages - Minimum requirements and tests

Unités de chargement intermodales et véhicules utilitaires - Stabilité au transport des colis - Exigences minimales et essais

Intermodale Ladeeinheiten und Nutzfahrzeuge - Transportstabilität von Packstücken - Mindestanforderungen und Prüfungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 119.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword

This document (prEN 17321:2018) has been prepared by Technical Committee CEN/TC 119 “Intermodal Loading Units and Cargo Securing”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

1 Scope

The transport stability of packages is a vital part of transport safety and the possibility of securing the cargo on different types of Cargo Transport Units (CTUs). This document specifies the requirements for marking and different methods for testing the transport stability of packages.

A package means the complete product of the packing operation, consisting of the packaging and its contents prepared for transport.

The transport stability of the packages is divided to different levels depending on the capability to withstand the forces during the transport. The transport stability of packages requires different types of CTUs and/or securing methods to obtain safe cargo securing during the entire transport. Due to the different transport stability of the packages and different types of CTUs, additional securing of the cargo has to be determined in each specific case.

Before the package is prepared for the transport it can be defined as a handling unit without any transport packaging material to obtain transport stability. The minimum requirement for the stability of the handling unit is set to obtain a safe handling both before and after the transport.

The aim of the different test methods is to define the Transport Stability Level (TSL) of a package or handling unit.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IMO/ILO/UNECE *Code of Practice for Packing of Cargo Transport Units* (CTU Code)

EN 12642:2016, *Securing of cargo on road vehicles - Body structure of commercial vehicles - Minimum requirements*

EN 12195-1:2010, *Load restraining on road vehicles - Safety - Part 1: Calculation of securing forces*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
acceleration / deceleration
rate of change of velocity of a package or handling unit with reference to time

Note 1 to entry: Acceleration / deceleration is measured in m/s^2 or “g”

3.2
acceleration / deceleration characteristic
characteristic describing the increase of an acceleration from zero followed by a period of dwell up to a defined level followed by the decrease within a defined period of time

3.3
acceleration / deceleration characteristic programmer
technical device which is a part of the test device / machine to control the parameters of the acceleration / deceleration characteristic

3.4
test specimen (test item)
package or handling unit used during the test

Note 1 to entry: The filling medium may be original cargo or substitute material with similar property as the original cargo

3.5
package
complete product of the packing operation, consisting of the packaging and its contents prepared for transport

3.6
handling unit
package without any transport packaging material to obtain transport stability

3.7
Cargo Transport Unit (CTU)
intermodal loading unit or commercial vehicle

3.8
Transport Stability Level (TSL)
minimum horizontal acceleration that a package or handling unit can withstand without specified permanent deformation or displacement

4 Requirements, test methods and evaluation

4.1 General requirements

The deceleration values a (g) for stability tests shall be in agreement with already existing standards like the CTU Code: 2014 (IMO/ILO/UNECE Code of Practice for Packing of CTUs) or EN 12195-1:2010.

The transport stability of the package or handling unit is divided into different Transport Stability Levels (TSL) based on the horizontal acceleration it can withstand, according to Table 1.

Table 1 — Transport Stability Level

Transport Stability Level (TSL)	***Horizontal acceleration a***
TSL 1	$a \geq 1{,}0$ g
TSL 2	0,8 g ≤ a < 1,0 g
TSL 3	0,5 g ≤ a < 0,8 g
TSL 4	0,18 g ≤ a < 0,5 g
NOTE For requirements on cargo securing, see EN 12195-1	

Mandatory minimum level of the stability of the handling unit, without any transport packaging material during handling shall be:

$a \geq 0{,}18$ g (equal to a tilt angle of 10°)

a = acceleration in horizontal direction

g = acceleration of gravity 9,81 m/s²

To obtain the mandatory minimum level the test specimen shall be tested free standing with bottom blocking in the test direction only, not influencing the stability of the test specimen. The test specimen shall be tested both in longitudinal and transverse direction. For asymmetric cargo, tests in all four directions are needed.

4.2 Test methods

Verification of conformity to the requirements of this standard shall be provided either by:

a) dynamic deceleration test according to Annex A;

b) dynamic driving test according to EN 12642:2016;

c) static test according to EN 12195-1:2010.

The principles of the different test methods are described below.

1) The principle of a dynamic deceleration test is to apply a defined horizontal deceleration to a test specimen placed on a movable carriage where test specimen is subject to a controlled stop with the defined (programmed) acceleration/deceleration characteristic. Depending on the test device different methods can be used to achieve the deceleration. For instance the carriage may be stopped by reaction mass of technical devices (hydraulic, air pressure, layer of foam, etc.). The carriage may alternatively be driven by an electric motor or induction accelerator by which the controlled stop is performed.

The dynamic deceleration test is described in Annex A. Informative sketches are shown in Annex B.

2) Another option to examine the transport stability of a package or handing unit is to perform a dynamic driving test with the packages on basis of the tests described in Annex B of the Standard EN 12642 according to Table 2.

Table 2 — Dynamic driving tests according to Standard EN 12642:2016 Annex B to test Transport Stability Level

Transport Stability Level (TSL)	***Horizontal acceleration*** a	***Braking test forwards B5.2 of EN 12642***	***U-turn test B5.3 of EN 12642***	***Change of lane test B5.4 of EN 12642***
TSL 1	a ≥ 1,0 g	x	-	-
TSL 2	0,8 g ≤ a < 1,0 g	x	-	-
TSL 3	0,5 g ≤ a < 0,8 g	x	x	x
TSL 4	a < 0,5 g	x	x	x
NOTE x = test method possible				

TSL can be tested with any of the three methods with applicable acceleration and duration. For all TSL the obtained acceleration might be specified on the label.

3) The third option to examine the transport stability of a package or handling unit is to perform a static test. The principle of a static test is to tilt up a package or a handling unit on basis of D.2 of standard EN 12195-1:2010 or Annex 7, appendix 5 of the CTU Code. Horizontal acceleration for transport stability level is calculated according to D.2.3.3 (Formula D.5) of standard EN 12195-1:2010.

   Informative sketches for static test are described in Annex C.

Described test methods can be used only for packages or handling units which do not completely tilt during testing. The maximum achieved angle before tilting is considered as value for TSL. The tilting stability of an unsecured package or handling unit in different directions can be determined according to 5.2 of EN 12195-1:2010 or by the test methods described above.

4.3 Evaluation

The permanent deformation or displacement of the test specimen from the original position after the test shall be less than 40 mm in any horizontal direction.

5 Procedure

The horizontal deceleration with its parameters (if applicable: shape, peak acceleration, duration, dwell time etc.), the climatic conditioning of the test specimen as well as the property and characteristic of the test specimen are to be predetermined before the test starts.

The climatic condition (temperature, relative humidity) during the test shall be documented. When the test specimen is conditioned in a specific climate the test itself shall be started within at maximum 5 minutes and shall be ended after at maximum 15 minutes after taken out of the climatic chamber. Particularly where this is critical to the test specimen material itself or its stability giving aids (foil, strapping etc.).

Wherever possible the test may as well be carried out in those atmospheric conditions which are identical to those used for test specimen conditioning (climate chamber, outdoor).

Tests shall be performed for each direction 3 times with the same test specimen. During the complete test procedure no adjustment is allowed. The maximum deformation or displacement shall be measured at the front side and the back side of the test specimen based on the original vertical projection.

When dynamic deceleration tests or dynamic driving tests are performed, minimum acceleration dwell time shall be 1000 ms. While a duration of 80 ms the arithmetic average shall meet the required acceleration value. The arithmetic average of the required acceleration is allowed to fall below the required value by 0,05 g in case this value is applied over a period of one second.

For static test: In addition to EN 12195-1:2010, testing inclination shall last for at least 5 s.

6 Marking

All packages tested according to this standard shall be marked with the Transport Stability Level, TSL for packages (as well as with reference to this document), separately or incorporated with other markings.

The TSL marking:

a) shall be displayed on at least one side of each package;

b) shall be marked with letters at least 12 mm high;

c) shall be visible and readable;