SLOVENSKI STANDARD
SIST EN 13545:2002

01-september-2002

Vrhnja gradnja palete - Paletne prirobnice - Preskusne metode in zahteve kakovosti

Pallet superstructures - Pallet collars - Test methods and performance requirements

Palettenaufbauten - Palettenaufsetzrahmen - Prüfverfahren und Leistungsanforderungen

Superstructures pour palettes - Rehausses pour palettes - Méthodes d'essai et exigences de performance

Ta slovenski standard je istoveten z: EN 13545:2002

ICS:

55.180.20 Veļ namenske palete General purpose pallets

SIST EN 13545:2002 **en**

EUROPEAN STANDARD

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EN 13545

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ICS 55.180.20

English version

Pallet superstructures - Pallet collars - Test methods and performance requirements

Superstructures pour palettes - Rehausses pour palettes - Méthodes d'essai et exigences de performance

Palettenaufbauten - Palettenaufsetzrahmen - Prüfverfahren und Leistungsanforderungen

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This European Standard exists 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 Management Centre has the same status as the official versions.

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

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Contents

Foreword

This document EN 13545:2002 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of an identical text or by endorsement, at the latest by October 2002, and conflicting national standards shall be withdrawn at the latest by October 2002.

Annex A is informative. Annex B is normative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This European Standard is intended for new and mainly reusable pallet collars, with a common standard height of 200 mm and 400 mm. This European Standard is based on existing national standards for general purpose pallet collars made of timber and primarily valid for such collars. Following requirements by users, a new category for lighter loads has been introduced - Light duty pallet collars. These are required to pass a lower test requirement than the general purpose pallet collars.

A large amount of knowledge exists from a long experience in the use of pallet collars. Where product standards exist, it may not be necessary to have verification of performance by testing.

Annex A shows commonly used dimensions for reusable general purpose pallet collars.

Annex B shows the suitable plywood quality for pallet collars.

For pallet collars in other materials, strength requirements according to this standard can be used but it should be presupposed that such constructions can require special testing or conditioning.

1 Scope

This European Standard specifies test methods and performance requirements for reusable wooden and woodbased pallet collars. There are two categories of construction:

i) - class 1: general purpose pallet collars;

ii) - class 2: light duty pallet collars.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 314-2, *Plywood — Bonding quality — Part 2: Requirements.*

ISO 3130, *Wood — Determination of moisture content for physical and mechanical tests.*

prEN 13183-1, *Round and sawn timber — Method of measurement of moisture content — Part 1: Method for determining moisture content of a piece of sawn timber (Oven-dry method).*

prEN 13183-2, *Round and sawn timber — Method of measurement of moisture content — Part 2: Method for determining moisture content of a piece of sawn timber (Electrical method).*

3 Conditioning

3.1 At manufacturing and testing of wooden pallet collars the moisture content shall be 14 % - 20 % of the weight of the timber in the anhydrous state. In connection with the test, the moisture content of the timber shall be determined before and after the test.

3.2 The testing shall be carried out at a temperature of 20 °C ± 5 °C. The pallet collars and the pallets shall be kept in the test atmosphere for at least 48 h before testing.

4 Apparatus

4.1 Testing machine capable of applying load in vertical and/or horizontal direction and with a measuring accuracy of ± 3 %.

4.2 The accuracy of positioning of components shall be within ± 2 mm.

4.3 Devices to have the pallets secured for test 6.3 and 6.5.

4.4 Instrument for measuring deformation with an accuracy of 0,2 mm.

4.5 Determination of moisture content in accordance with ISO 3130, prEN 13183-1 and prEN 13183-2.

5 Procedure

5.1 Carry out the tests either at a constant rate of loading of (2 ± 0,2) kN/min, or constant speed of the testing machine loading head of (30± 5) mm/min.

5.2 In connection with the tests, the moisture content of the timber shall be recorded.

5.3 The pallet collars tested shall be discarded after every test.

6 Testing

6.1 General

Tests shall be conducted as follows:

1. bending stiffness and strength;
2. tensile testing of hinge and rivet joint (not applicable to pallet collars with rigid corner bars);
3. shear loading of supporting lips;
4. load testing of stacked pallet collars.

6.2 Bending stiffness and strength

6.2.1 Test selection

Bending stiffness and strength tests shall be performed on the appropriate type of pallet collar:

1. rigid side pallet collars;
2. folding hinged pallet collars.

6.2.2 Test 1a — Bending stiffness and strength — Rigid side pallet collars

Three tests shall be performed with test pieces taken from different collar sides.

6.2.3 Apparatus

Test arrangement according to Figure 1a

6.2.4 Testing procedure

A piece of a collar side about 600 mm long is placed flat and horizontal on supports movable in the long side direction of the test piece.

With the supports parallel two forces acting across the whole width of the test piece are applied against the test piece.

The force is transferred to the test piece by the half round steel profiles of 20 mm diameter.

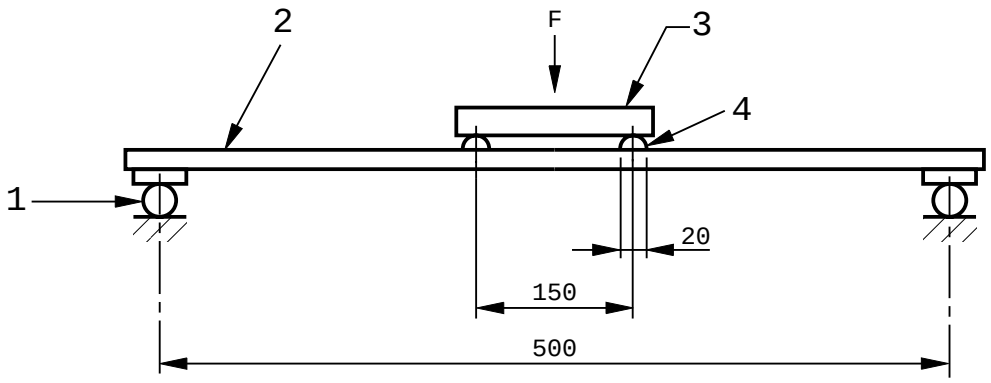
The plane surface shall be turned against the test piece. The half round steel profiles shall be symmetrically placed with a relative position to each other of 150 mm.

The force is increased continuously to:

for sides of 200 mm	General purpose pallet collars	3,22 kN
	Light duty pallet collars	1,61 kN
for sides of 400 mm	General purpose pallet collars	6,44 kN
	Light duty pallet collars	3,22 kN

At this force the bend at the middle of the test piece is measured. The force is then increased until the test piece breaks.

Dimensions in millimetres



Key

F = Force

1	Movable bearing	2	Test piece
3	Load distribution plate	4	Half round steel

Figure 1a — Testing of bending stiffness and strength – Rigid side

6.2.5 Performances requirements

For general purpose collars at a force of 3,22 kN respectively 6,44 kN the deflection at the centre shall not be more than 8 mm. For light duty collars the deflection at the centre shall not be more than 8 mm at a force of 1,61 kN respectively 3,22 kN.

The breaking strength shall be for:

General purpose pallet collars	minimum 6,44 kN	respectively 12,88 kN
Light duty pallet collars	minimum 3,22 kN	respectively 6,44 kN

6.2.6 Test 1b - Bending stiffness and strength test – Collar side with folding hinge

Three tests shall be performed with test pieces taken from different collar sides.

6.2.7 Apparatus

Test arrangements according to Figure 1b.

6.2.8 Testing procedure

A piece of a collar side, about 600 mm long, is placed flat and horizontal with the hinge down on supports movable in the long side direction of the test piece.

With the supports parallel two forces acting across the whole width of the test piece are applied against the test piece.

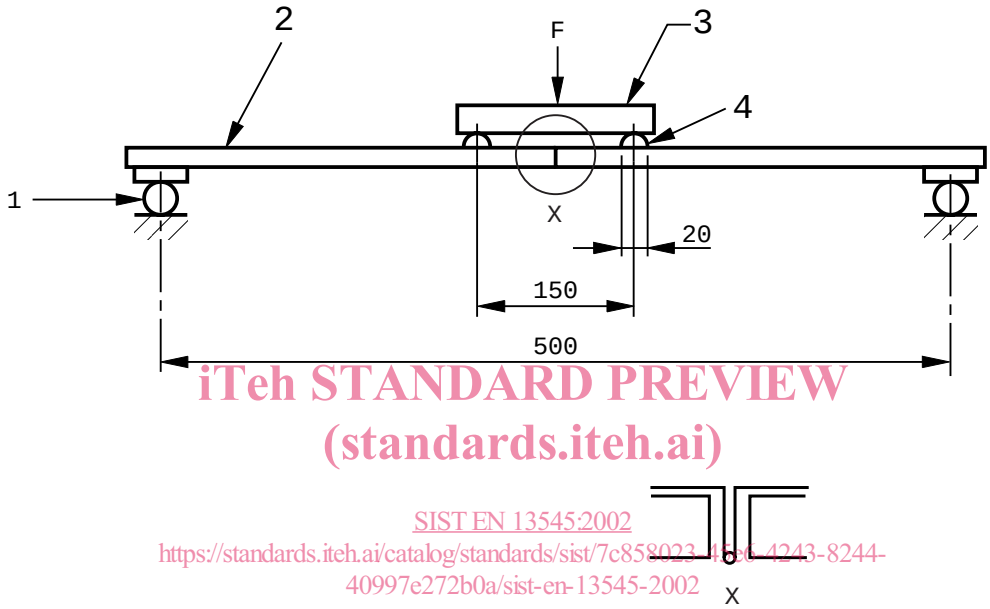
The force is transferred to the test piece by the half round steel profiles of 20 mm diameter. The plane surface shall be symmetrically placed at a relative distance of 150 mm whatever is the most suitable for the design of the hinges.

The force is increased continuously to:

for sides of 200 mm	General purpose pallet collars	3,22 kN
	Light duty pallet collars	1,61 kN
for sides of 400 mm	General purpose pallet collars	6,44 kN
	Light duty pallet Collars	3,22 kN

At this force the deflection at the centre of the test piece is measured. The force is then increased until the test piece breaks.

Dimensions in millimetres



Key

F = Force

1	Movable bearing	2	Test piece
3	Load distribution plate	4	Half round steel

Figure 1b — Testing of bending stiffness and strength – Collar side with folding hinge

6.2.9 Performance requirements

For general purpose collars at a force of 3,22 kN respectively 6,44 kN the deflection at the centre shall not be more than 8 mm. For light duty collars the deflection at the centre shall not be more than 8 mm at a force of 1,61 kN respectively 3,22 kN.

The breaking strength shall be for:

General purpose pallet collars	minimum 6,44 kN	respectively 12,88 kN
Light duty pallet collars	minimum 3,22 kN	respectively 6,44 kN

6.3 Tensile testing of hinge and rivet joint (not applicable to pallet collars with rigid corner bars)

6.3.1 Test 2 — Tensile testing of hinge and rivet joint (not applicable to pallet collars with rigid corner bars)

Three hinges shall be tested.

6.3.2 Apparatus

Test arrangement according to Figure 2. The pieces of pallet collar shall at testing be torsion proof fastened at a minimum length of 100 mm, at distance of 150 mm from the hinge pin.

Dimensions in millimetres

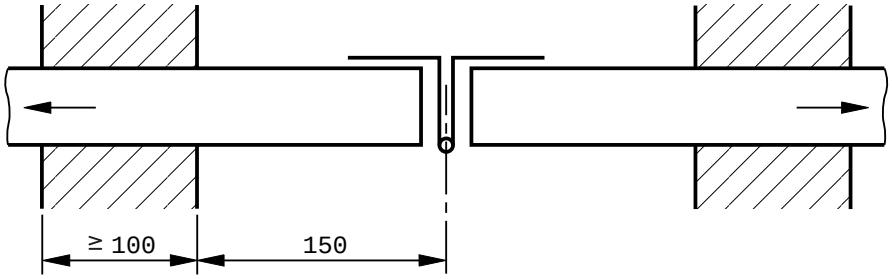


Figure 2 — Tensile testing of hinge and rivet joint

6.3.3 Testing procedure

Two adjacent collar sides are cut off 250 mm to 300 mm from hinge in between via the rigid steel girder.

The corner is folded out in such a way that the collar sides are in one plane. The hinge is loaded with tensile forces acting in the centre lines of the collar sides.

6.3.4 Performance requirements

The hinge tested according to 6.2.3 shall resist a force of 2 kN for 200 mm and 4 kN for 400 mm general purpose pallet collar and 1 kN respectively 2 kN for light duty pallet collars. The residual deformations of the assembly shall not exceed 2 mm (1,0 mm per hinge flange).

The hinge or rivet joint shall not break before the tensile force has risen to 6 kN for a 200 mm and 12 kN for a 400 mm general purpose pallet collar and 3 kN respectively 6 kN for light duty pallet collars.

6.4 Shear loading of supporting lips

The test may be performed on either a whole collar Test 3, or a partial collar Test 3a.

6.4.1 Test 3 — Shear loading of supporting lips

6.4.2 Apparatus

Test arrangement according to Figure 3, consisting of:

1. standard pallet mounted rigidly at a solid horizontal support;
2. pallet collar;
3. rigid steel girder with a width of 100 mm and a length greater than the collar side.

To prevent the pallet collar from raising it shall be loaded as indicated in Figure 3 with a dead load of 100 kg.