SLOVENSKI PREDSTANDARD

oSIST prEN 15570-1:2006

november 2006

Pohištveno okovje – Trdnost in trajnost odmičnih spon (šarnirjev) in njihovih sestavnih delov – 1. del: Odmične spone (šarnirji), pregibne v navpični osi

Hardware for furniture - Strength and durability of hinges and their components - Part 1: Hinges pivoting on a vertical axis

ICS 97.140

Referenčna številka
oSIST prEN 15570-1:2006(en)

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 15570-1

September 2006

ICS

English Version

Hardware for furniture - Strength and durability of hinges and their components - Part 1: Hinges pivoting on a vertical axis

Möbelbeschläge - Festigkeit und Dauerhaltbarkeit von Scharnieren und deren Komponenten - Teil 1: Scharniere mit vertikaler Drehachse

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 207.

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland 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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. prEN 15570-1:2006: E

Contents

Page

Foreword

This document (prEN 15570-1:2006) has been prepared by Technical Committee CEN/TC 207 “Furniture”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

Introduction

The aim of this draft European Standard is to provide furniture manufacturers, designers and developers with comparable information regarding the performance of all types of hinges and their components.

It consists of 2 parts, part 1 for hinges pivoting on a vertical axis and part 2 for hinges pivoting on a horizontal axis. Part 2 will be developed at a later stage.

1 Scope

This part of European Standard xxxxx specifies test methods and requirements for the strength and durability of all types of hinges pivoting on a vertical axis and their components for all fields of application

The tests consist of the application of loads, forces and velocities simulating normal functional use, as well as misuse, that might reasonably be expected to occur.

With the exception of the corrosion test in clause 6.4, the tests are designed to evaluate properties without regard to materials, design/construction or manufacturing processes.

The strength and durability tests only relate to the hinges and the parts used for the attachment, e.g. mounting plates and screws.

The strength and durability tests are carried out in a test frame with specified properties. The test results can only be used as a guide to the performance of a piece of furniture.

The test results are only valid for the hinges tested. These results may be used to represent the performance of production models provided that the tested model is representative of the production model.

With the exception of corrosion, ageing and the influence of heat and humidity are not included.

Annex A (normative): Requirements for product information.

Annex B (normative): Loads and cycles.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 320:1993, *Fibreboards; determination of resistance to axial withdrawal of screws*.

EN 323:1993, *Wood-based panels; determination of density*.

prEN ISO 6270-4:2003, *Paints and varnishes - Determination of resistance to humidity - Part 4: Condensation-water test atmospheres (ISO/DIS 6270- 4:2003)*

EN ISO 1110:1997, *Plastics - Polyamides - Accelerated conditioning of test specimens* (ISO 1110:1995)

3 Terms and definitions

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

3.1
catch device
device, which keeps or pulls a door in place, but does not require a second action in order to release it, e.g. a magnetic catch or a self-closing or self-opening mechanism

3.2
damper
a mechanism which stops the movement of a door gently

4 General test conditions

4.1 Preliminary preparation

The hinges shall be assembled/adjusted/mounted in the most adverse configuration according to the manufacturer's instructions for each test sequence.

If mounting, adjustment or assembly instructions are not supplied, the mounting, adjustment or assembly method shall be recorded in the test report. Fittings shall be tightened before testing and shall not be re-tightened unless specifically required in the manufacturer's instructions.

The tests shall be carried out in indoor ambient conditions at a temperature between 15 °C and 25 °C. If during a test the temperature is outside of the range of 15 °C to 25 °C, the maximum and/or minimum temperature shall be recorded in the test report.

Hinges which include structural hardware parts made of hygroscopic plastic materials, e.g. polyamide shall be conditioned at (23 ± 5) °C and a relative humidity of (50 ± 5) % for 7 days before testing.

NOTE For accelerating the conditioning process, EN ISO 1110:1997 may be used.

In the case of designs not addressed in the test procedures, the tests shall be carried out as far as possible as described, and deviations from the test procedure recorded in the test report.

Before beginning the testing, visually inspect the hinges and components thoroughly. Record any defects so that they are not assumed to have been caused by the tests. Carry out measurements if specified.

4.2 Test equipment

Unless otherwise specified, the tests may be applied by any suitable device, because results are not dependent upon the apparatus.

The equipment shall not inhibit deflection of the test door, i.e. it shall be able to move so that it will allow the deflection of the test door during testing.

4.3 Application of forces

The forces in the static load tests shall be applied sufficiently slowly to ensure that negligible dynamic force is applied. Unless otherwise specified, each force shall be maintained for not less than 10 and not more than 15 seconds.

The forces in durability tests shall be applied at a rate to ensure that excessive heating does not occur.

The forces may be replaced by masses. The relation 10 N = 1 kg shall be used for this purpose.

4.4 Tolerances

Unless otherwise stated, the following tolerances are applicable:

Forces: ± 5 % of the nominal force;

Velocities: ± 5 % of the nominal velocity;

Masses: ± 1 % of the nominal mass;

Dimensions: ± 1 mm of the nominal dimension;

Angles: ± 2^{o} of the nominal angle.

The accuracy for the positioning of forces shall be ± 5 mm.

4.5 Sequence of testing

The tests shall be carried out in the same sequence as the clauses are numbered in this standard. If the clause sequence is not followed, the sequence shall be recorded in the test report.

4.6 Inspection and assessment of results

Before and after completion of each test, carry out the inspection as specified, after using adjustment devices, if available.

Record any changes that have taken place since the initial inspection.

The inspection shall include at least the following:

a) the fracture of any component or joint;

b) the loosening of any joint intended to be rigid, which can be demonstrated by hand pressure;

c) the deformation or wear of any part or component such that its functioning is impaired;

d) the loosening of any means of fixing components;

e) any impaired function of a component or part.

5 Test apparatus

5.1 Masses

Masses shall be designed so that they do not reinforce the structure or re-distribute the stresses.

5.2 Test frame

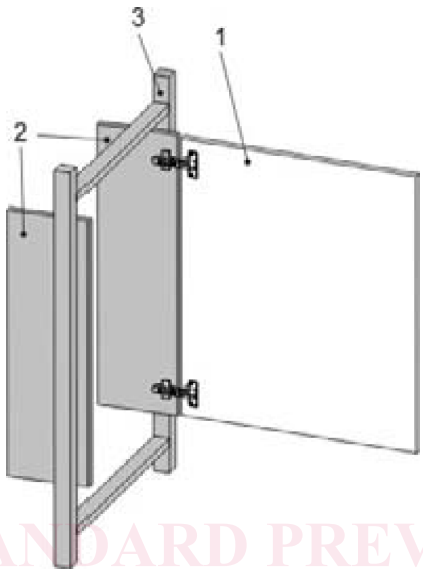
The tests specified in clause 6.2 and 6.3 shall be carried out in a test frame (see figure 1), which is so constructed that the deformation under the applied load is no more than 1 mm.

Hinges for wooden doors shall be mounted on particle board, 5.3, unless otherwise specified.

Hinges for other materials, e.g. glass, metal or plastic shall be mounted according to the manufacturer's instructions.

The position of hinges and components on the door and the test frame as well as the size and weight of the door shall be as specified by the manufacturer, see Annex A.

In cases where the door parameters (e.g. height, width, mass) are not specified by the manufacturer, the tests may be carried out using the standard door sizes specified in Annex B.



Key

1 Test door

2 Test sides

3 Test frame

Figure 1 — Test frame and test door

5.3 Particle board properties

The properties of the particle board shall be as specified in Table 1.

Table 1 — Particle board properties

Property	Reference standard	Requirement
Axial withdrawal of screws	EN 320:1993	1 100 ± 100 N
Density	EN 323:1993	0,65 ± 0,05 g/cm^3

6 Test procedures and requirements

6.1 General

For the following tests, three sets of hinges shall be used as follows:

The first set shall be used for the first test sequence specified in clause 6.2.

The second set shall be used for the second test sequence specified in 6.3.

The third set shall be used for the corrosion test specified in 6.4.

All overload and functional tests shall be carried out according to the same column (1, 2 or 3) in Annex B (normative).

6.2 Overload tests

6.2.1 Vertical static overload

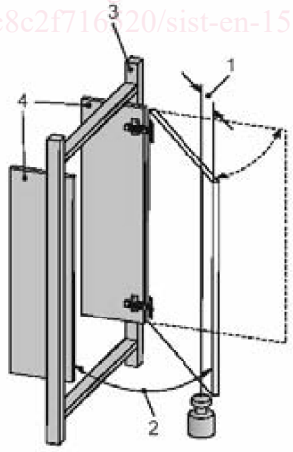
Load the door as shown in figure 2 with the mass specified in Annex B. The mass shall be suspended 100 mm from the edge furthest from the hinge.

Open and close the door 10 full cycles (back and forth) from a position 45° from fully closed to a position 10° from fully opened, up to a maximum of 135° from the fully closed position.

Opening and closing can be done by hand using 3 s to 5 s for opening and 3 s to 5 s for closing.

Carry out inspection and assessment according to clause 4.6 without the test load.

The door or parts of it shall not become detached.



Key

1 100mm

2 45°

3 Test frame

4 Test sides

Figure 2 — Vertical static overload

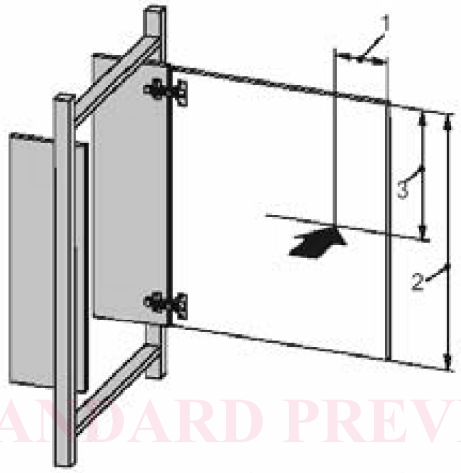
6.2.2 Horizontal static overload

This test applies only to hinges with an opening angle ≤ 135°.

Apply the horizontal static load specified in Annex B 10 times perpendicular to the plane of the door on its horizontal centreline 100 mm from the edge furthest from the hinge, as shown in figure 3.

Carry out inspection and assessment according to clause 4.6 without the test load.

The door, hinges or their components shall not become detached.



Key

1 100 mm

2 Door height

3 Half door height

Figure 3 — Horizontal static overload

6.3 Functional tests

During testing according to clause 6.3, the test door shall be loaded according to Annex A and B.

6.3.1 Operating forces

The operating forces shall be measured before and after the durability test. The measurements of operating forces shall be made with the door unloaded.

6.3.1.1 Closing force, hinges with self-closing mechanisms

The closing force of hinges with self closing mechanisms shall be measured as shown in fig. 4.

Before measuring the closing force F_o, the door must be fully opened 10 times by hand.

The door shall be moved slowly towards the closed position. The static closing force shall be measured at a position 0,5 mm before the fully closed position.

ENQUIRY NOTE The measuring method is preliminary and should be evaluated during the enquiry period.