



# SLOVENSKI STANDARD

## SIST EN 12727:2001

01-februar-2001

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### Pohištvo - Vrstni sedeži - Preskusne metode in zahteve za trdnost in trajnost

Furniture - Ranked seating - Test methods and requirements for strength and durability

Möbel - Festmontiertes Reihengestühl - Prüfverfahren und Anforderungen an die Festigkeit und Dauerhaltbarkeit

Meubles - Sieges en rangées - Méthodes d'essai et exigences pour la résistance et la durabilité

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Ta slovenski standard je istoveten z: **EN 12727:2000**

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#### **ICS:**

97.140

Pohištvo

Furniture

**SIST EN 12727:2001**

**en**

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EUROPEAN STANDARD

EN 12727

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2000

ICS 97.140

English version

## Furniture - Ranked seating - Test methods and requirements for strength and durability

Meubles - Sièges en rangées - Méthodes d'essai et exigences pour la résistance et la durabilité

Möbel - Festmontiertes Reihengestühl - Prüfverfahren und Anforderungen an die Festigkeit und Dauerhaltbarkeit

This European Standard was approved by CEN on 10 August 2000.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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STANDARD PREVIEW

## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 207 "Furniture", the secretariat of which is held by IBN.

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 March 2001, and conflicting national standards shall be withdrawn at the latest by March 2001.

Annex A 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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

This European Standard specifies test methods and requirements determining the structural strength and durability of all types of ranked seating, (e.g. stadium and auditorium seating) which are permanently fastened to the floor and/or walls, whether in bench or individual seat form. A table of tests values with four choices of loads and cycles is included.

This standard applies to seating permanently fixed in ranks but does not apply to linked upright chairs not fastened to the floor and/or walls.

Assessment of ageing, degradation and the effect of ambient temperature are not included. For these, reference should be made to the appropriate standard (e.g. a standard is in preparation under the title "Spectator Facilities, product characteristics of seats").

The tests are not intended to assess the durability of upholstery materials, such as upholstery filling materials and upholstery covers.

The tests are designed to evaluate structural strength and durability of ranked seating without regard to materials, design/construction or manufacturing processes.

## 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).

ISO 2439:1997 Flexible cellular polymeric materials – Determination of hardness (indentation technique)

### 3 Terms and definitions

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

#### 3.1 static tests

tests consisting of heavy loads being applied a few times to ensure that the furniture has sufficient strength under the highest levels of loading that might reasonably be expected to occur.

#### 3.2 impact tests

tests to assess the strength of the article under shock loading that might reasonably be expected to occur.

#### 3.3 durability tests

tests simulating the repeated application of loads or movement of components occurring during long-term use.

#### 3.4 structure

load bearing parts of furniture such as the frame, seat, back and arm supports and suspension.

#### 3.5 auxiliary writing surface

small work surface attached to the structure of the chair which may be deployed temporarily for writing or similar activities.

### 4 General Test Conditions

#### 4.1 Preliminary preparation

Before any of the tests are commenced, the item shall be old enough to ensure that it has developed its full strength. At least four weeks in normal indoor conditions shall have elapsed between manufacture and testing in the case of glued joints in timber and the like.

The tests shall be carried out in indoor ambient conditions but if during a test the atmospheric temperature is outside the range 15°C to 25°C the maximum and/or minimum temperature shall be recorded in the test report.

Immediately before commencement of testing, inspect each item thoroughly. Note any defects in the members, joints or attachments so that they are not attributed to the effect of tests when the tests have been completed. Carry out a dimensional check of the article in any case where it can be expected to suffer deformation as a result of testing.

The tests are designed to be applied to a sample of seating that is fully assembled and mounted in a manner representative of the service conditions.

#### 4.2 Test Sample

Samples of seating submitted for test shall be mounted according to the manufacturers instructions to a structure representative of the service installation.

This structure shall be sufficiently strong and stiff to eliminate the possibility of it affecting the results of the tests.

Samples of continuous seating of individual seats with common structured members shall consist of at least two adjacent seating positions, including one end of row unit.

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### 4.3 Application of forces

The test forces in strength tests shall be applied sufficiently slowly to ensure that dynamic forces are negligible. The forces in durability tests shall be applied sufficiently slowly to ensure that heating does not occur.

Unless otherwise stated each static load shall be maintained for a minimum of  $(10 \pm 2)$  s, and durability loads shall be maintained for not less than 1 second.

### 4.4 Determination of Seat and Back Loading Points - Method

#### 4.4.1 Single and Multiple Seats with Backs

Position the template (5.1) with its load applied at the seat loading point on the centreline of the seat as far towards the rear as possible. Adjust its position by pushing the backloading portion into the back, so levering the seat portion forwards until the shape of the template correlates with that of the seat (see figure 1). In cases where the template can be settled in more than one position, the position having the smallest angle between the seat and back portions of the template shall be used. The angle shall in no cases be less than  $90^\circ$ . Mark the required loading positions from the template. Repeat the procedures on the other seat(s).

#### 4.4.2 Stools and Benches

Set up the template (5.1) at  $90^\circ$  with the aid of the mark (c) as shown in figure 3. Place it on each seating position as shown in figure 1. Mark the required loading point from the template.

#### 4.4.3 Seat loading points

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If the number of seats in the article is not obvious, divide the total seat length (in mm) by 600 mm and round to the nearest whole number to determine the number of seats. Divide the total seat length into seats of equal length. Mark the position of each of the seats.

### 4.5 Test Apparatus

The tests may be applied by any suitable device because results are dependent only upon correctly applied loads and not upon the apparatus, except in the case of impact tests where the apparatus described in 5.9 and 5.10 shall be used.

The seat loading apparatus shall be such as not to restrain the chair from tilting back nor hinder horizontal movement of the chair when the back load is applied.

All loading pads shall be capable of pivoting in relation to the direction of the applied force and the pivot points shall be as close as practically possible to the load surface.

### 4.6 Tolerances

For tolerances, unless otherwise stated:

- all forces shall have an accuracy of  $\pm 5\%$  of the nominal force;
- all masses an accuracy of  $\pm 0,5\%$  of the nominal mass;
- all dimensions an accuracy of  $\pm 1,0$  mm of the nominal dimension;
- all angles an accuracy of  $\pm 2^\circ$

The tolerance for position of loading pads shall be  $\pm 5$  mm.

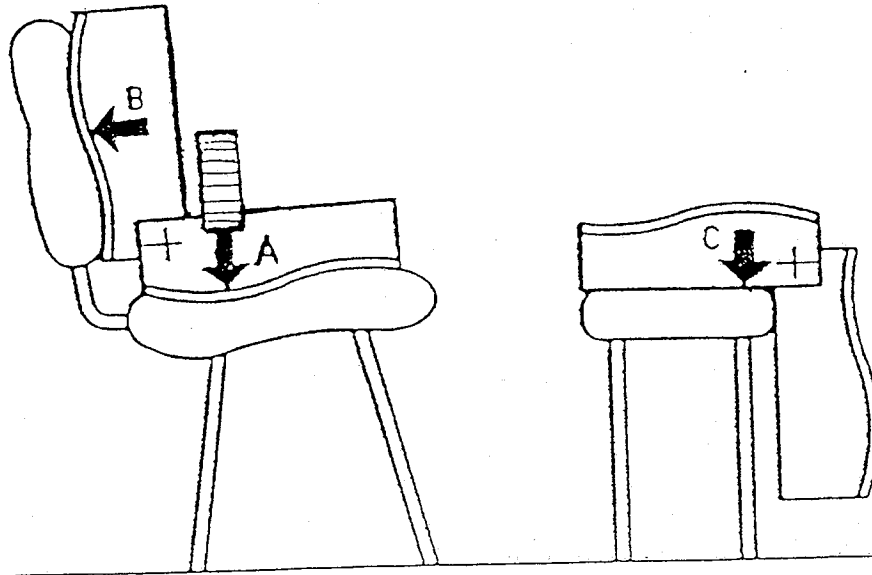


Figure 1 – Position of loading point template  
(standards.iteh.ai)

## 5 Test Equipment and Apparatus

**5.1 Loading position template**, (see Figures 2 and 3) consisting of two shaped members fastened together by a pivot at one end. The contours of the shaped surfaces are so devised as to sink into the upholstery. For this purpose the seat loading arm shall have a total mass of 20 kg, applied through the seat loading point.

The apparatus shall be marked as shown in Figure 3

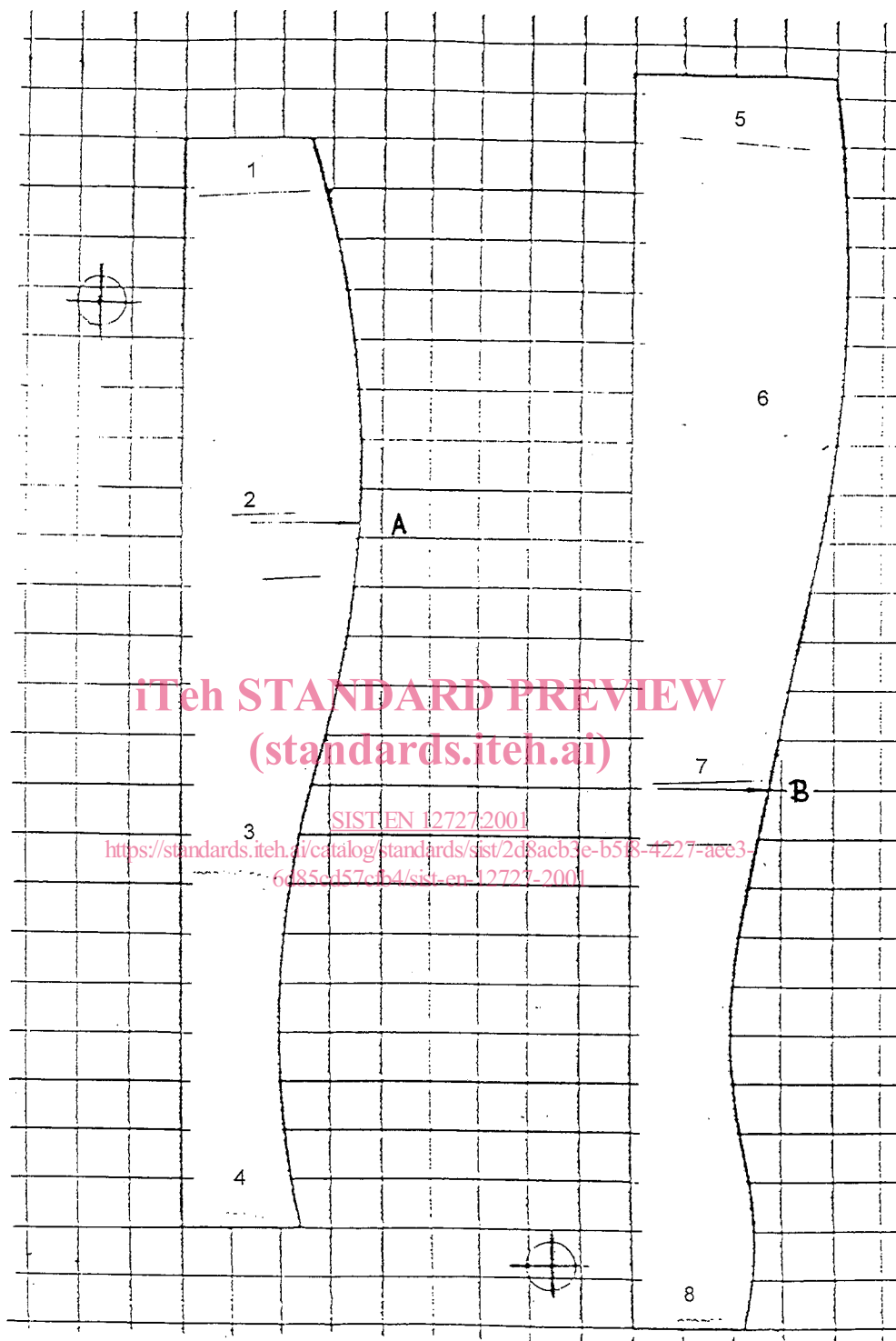
So that the template can be positioned easily with the two members at 90° to each other, a line shall be drawn on the back portion.

Loading points A and B correspond to those points on a chair being 175 mm forward of the seat and back intersection point on the seat and 300 mm upward from the seat and back intersection point on the back.

Loading point C corresponds to the point on a stool as 175 mm from one edge.

**5.2 Seat loading pad**, naturalistically shaped rigid indenter (see Figure 4) with a hard, smooth surface. Two examples are shown in Annex A.



**Key**

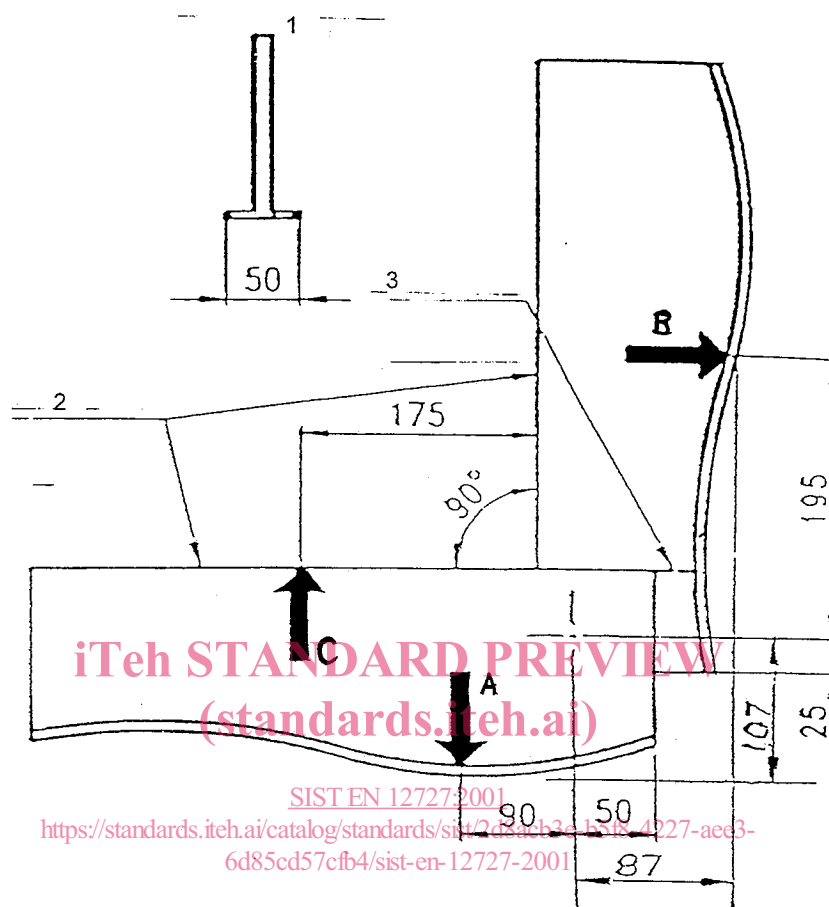
- 1 Rear
- 2 Seat load
- 3 Seat portion
- 4 Front
- 5 Top

- 6 Back portion
- 7 Back load
- 8 Bottom

Scale : each square : 20 × 20 mm

**Figure 2 – Loading surface curves for seat and back loading point template**

Dimensions in millimetres

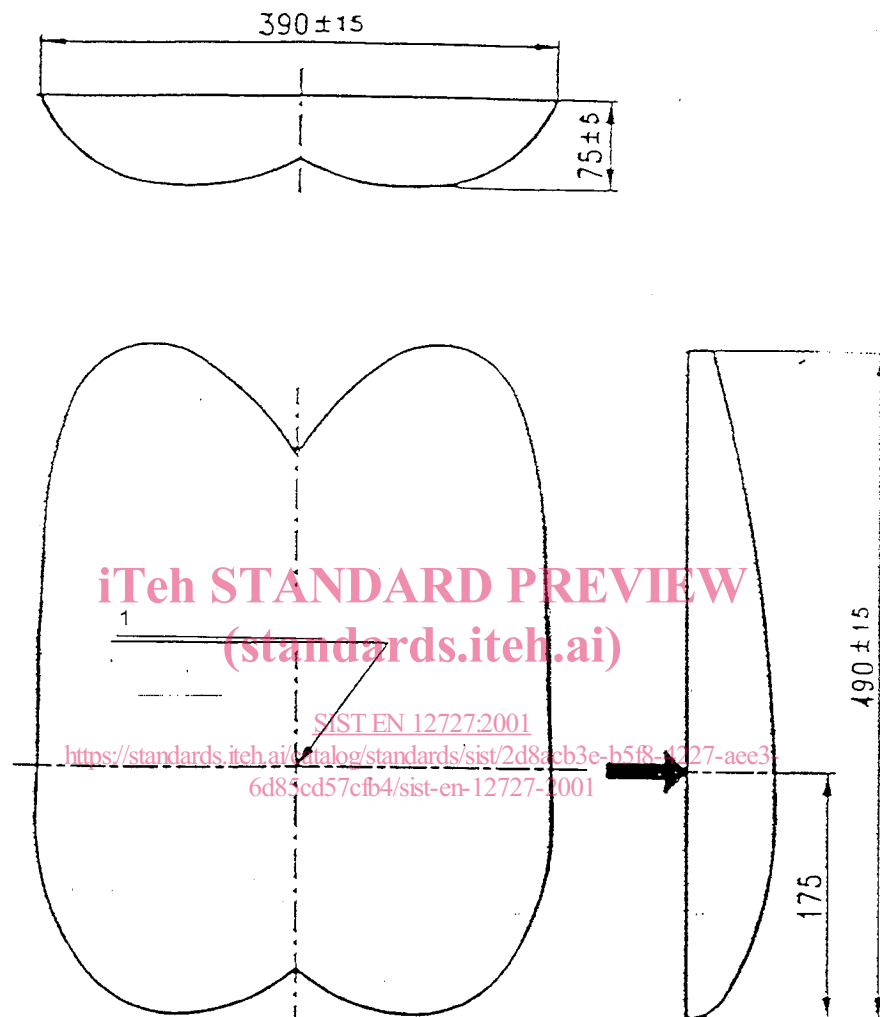
**Key**

- 1 Typical section
- 2 Straight edge for determination of seat or back inclination
- 3 Mark to fix 90°

- A = Seat load (chairs)
- B = Back load (chairs)
- C = Seat load (stools)

**Figure 3 – Loading point template**

Dimensions in millimetres

**Key**

1 Point of application of load

**Figure 4 – Seat loading pad – Overall dimensions**