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0 Introduction

This document is published as an European prestandard so that it can be completed with specific safety requirements and test methods in preparation on deckchairs and folding chairs and in the expectation of part 4 of EN 581 ; this part will fix safety requirements and test methods for the strength under weather conditions.

1 Scope

This part of EN 581 specifies the mechanical safety requirements and test methods of outdoor seating for camping, domestic and contract use for adults, without regard to materials, design/construction or manufacturing processes.

This prestandard does not apply to outdoor furniture for severe contract use where higher requirements may be necessary and to removable upholstery and coverings, permanently fixed furniture and street furniture.

Annex A includes tests methods for assessing the behaviour of outdoor seating at high and low temperatures.

The effect of ageing and degradation caused by light and moisture has not been included.

2 Normative references

This European prestandard 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 prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 1022	Domestic furniture - Seating - Determination of stability
ISO 48	Rubber, vulcanized or thermoplastic - Determination of hardness (hardness between 10 IRHD and 100 IRHD)
ISO 2439	Polymeric materials, cellular flexible - Determination of hardness (indentation technique)

3 Definitions

For the purpose of this European prestandard, the following definitions apply :

- 3.1 Outdoor furniture for contract use :** Outdoor furniture intended for non-private use in places with public access, e.g. restaurants, hotels, open-air swimming pools, vocational and leisure sites. Due to this public use they are submitted to high loads.
- 3.2 Outdoor furniture for domestic use :** Outdoor furniture intended for private use in places without public access e.g. garden, wintergarten, terrace, balcony, etc.
- 3.3 Outdoor furniture for camping use :** In accordance with the need for easy transportation, outdoor furniture for camping use are foldable or detachable and of light-weight construction. It is intended for use in connection with camping and/or travelling.

- 3.4 Stool, folding stool, camping stool** : Seating without backrest.
- 3.5 Garden chair, garden folding chair, camping chair** : Seating with a backrest for upright sitting posture.
- 3.6 Fixed armchair ; folding, non-adjustable armchair ; camping armchair (folding but non-adjustable)** :
Seating with backrest and armrests for upright or inclined sitting posture.
- 3.7 Multi-position armchair, camping multi-position armchair** : Armchair with a backrest adjustable in inclination and fixed or adjustable seating.
- 3.8 Directors' chair** : Camping folding seating with armrests and backrest. Seat and backrest are made of tightened textile material.
- 3.9 Bench** : Multi-place seating with or without backrest, with or without armrests.
- 3.10 Mobile lounger** : Seating intended for lying rest supplied with wheels and possibly handles, supplied with fixed or adjustable.
- 3.11 Lounger** : Seating intended for reclined posture without wheels. Loungers can be foldable.
- 3.12 Footrest** : Item intended to resting legs, with a fixed or adjustable height, independent or incorporated to an armchair,...
- 3.13 Deck chair** : Seat with a folds flat supplied with a support made of a flexible material (ex. linen) whose adjustable structure enables various resting postures. The deck chairs can be provided with armrests or not and possibly with a fixed footrest.

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.

The furniture shall be tested as delivered. Knock-down furniture shall be assembled according to the instructions supplied with it. If the furniture can be assembled or combined in different ways, the most adverse combination shall be used for each test. Knock-down fittings shall be tightened before testing if applicable. Further tightening shall not take place unless this is specifically required by the manufacturer.

The sample for test shall be stored in indoor ambient conditions for at least 1 week immediately prior to testing. Any deviation from this procedure shall be recorded in the test report.

With the exception of tests described in the annex A, the tests shall be carried out in normal indoor ambient conditions (temperature between 15°C and 25°C). For seating including fabric parts in their construction, the humidity shall be between 55 % and 65 %.

For each test, adjustable components shall be in the most unfavourable position.

4.2 Application of forces

The test forces in durability and static load tests shall be applied sufficiently slowly to ensure that negligible dynamic load is applied. The forces in fatigue tests shall be applied sufficiently slowly to ensure that heating does not occur.

4.3 Determination of seat and back loading points

The seat and back loading points shall be determined using the loading point template as specified below. In some cases, it may not be possible to determine the loading points by means of the template. In such cases, points 175 mm forward of the seat/back junction and 300 mm forward from the seat/back junction, shall be used.

If the number of seats in the article is not obvious, divide the total seat length (in millimetres) 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.

4.3.1 Chairs, armchairs, loungers, deck chairs

Position the template (5.1) with its head 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 back loading portion on 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°. Mark the required loading positions from the template. If relevant, repeat the procedures on the other seat(s).

4.3.2 Stools and benches

Set up the template (5.1) in order to form an angle at 90° with the 2 elements. Place it on the stool or on each sitting position as shown in figure 1. Mark the seat loading point from the template, facing mark (C).

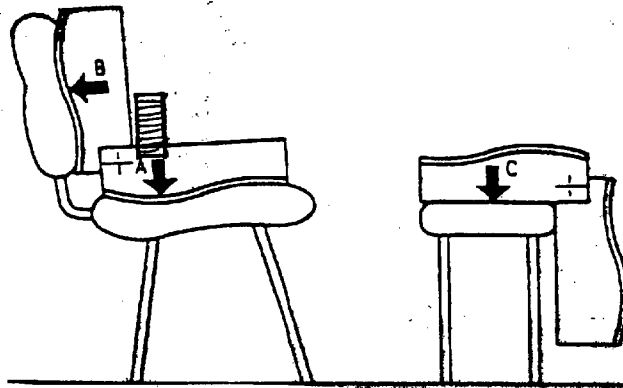


Figure 1 : Position of loading point template

4.4 Determination of seat and back angle

The angle of inclination of the back from the horizontal (θ) and, if necessary the angle of inclination of the seat from the horizontal (α), shall be measured by determining the slope of the straight edge of the relevant portion of the seat loading point template when it is correctly positioned (see figure 2).

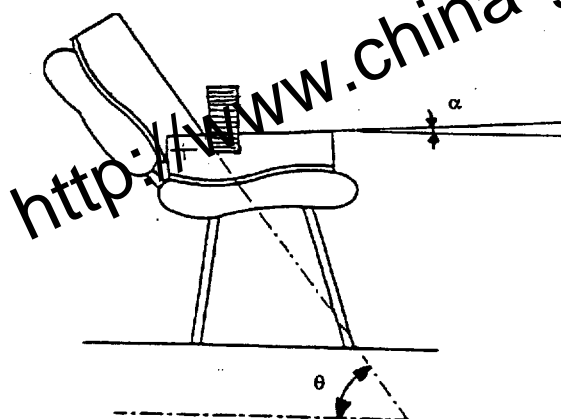


Figure 2 : Determination of back angle (θ) and seat angle (α)

4.5 Leg rests and foot rests

The loading points of a leg rest or a foot rest which are separate components, hinged or otherwise supported by the main structure, shall be determined from the centre lines of the components themselves.

When a leg rest or a foot rest is not a separate component but an extension of the seat structure, then the leg/foot rest area shall be taken as beginning at a distance of 400 mm forward of the seat loading point and the centre lines determined accordingly.

The seat front edge of chairs with extended seat structures to form a foot rest or a leg rest shall nevertheless be taken as the edge of the seat structure furthest away from the back rest.

4.6 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 ± 1 mm of the nominal dimension ;
- all angles an accuracy of $\pm 2^\circ$ of the nominal value.

The tolerance for position of loading pads shall be ± 5 mm.

4.7 Sequence of testing

The tests shall be carried out on the same sample in the following order :

- seat strength and fatigue ;
- backrest strength and fatigue ;
- armrest strength and fatigue ;
- leg strength ;
- stability.

5 Test equipment and apparatus

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

In the case of designs not catered for in the test procedures, carry out the test as far as possible as described and state any deviations in the test report.

Unless otherwise stated, loading pads shall swivel and be fixed such as they do not prevent the seat from moving during the test and such as forces shall be applied on the centre line axis of the loading pads.

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