

Outdoor furniture — Seating and tables for camping, domestic and contract use

Part 2: Mechanical safety requirements and test methods for seating

ICS 97.140; 97.200.30

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National foreword

This British Standard is the UK implementation of EN 581-2:2009. It supersedes DD ENV 581-2:2000 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee FW/0/2, Domestic & contract furniture.

A list of organizations represented on this committee can be obtained on request to its secretary.

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**Outdoor furniture - Seating and tables for camping, domestic
 and contract use - Part 2: Mechanical safety requirements and
 test methods for seating**

Mobilier d'extérieur - Sièges et tables à usages
 domestique, collectif et de camping - Partie 2: Exigences et
 essais de sécurité mécanique des sièges

Außenmöbel - Sitzmöbel und Tische für den Camping-,
 Wohn- und Objektbereich - Teil 2: Mechanische
 sicherheitstechnische Anforderungen und Prüfverfahren für
 Sitzmöbel

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Contents

Page

Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 General test conditions	5
5 Test equipment and apparatus.....	5
5.1 Rolling cylinder	5
5.2 Test floor.....	6
6 Test methods and requirements	6
6.1 Testing, general	6
6.1.1 Stability	6
6.1.2 Test sequence and test parameters.....	7
6.2 Requirements	8
6.2.1 General safety requirements	8
6.2.2 Stability requirements	8
6.2.3 Mechanical safety requirements	8
7 Instruction for use	8
7.1 General.....	8
7.2 Marking for mobile loungers	8
8 Test report	9
Annex A (normative) Additional test method for seating with a multi-position back rest	10
A.1 Fatigue test on back rest mechanism	10
A.1.1 Purpose of the test	10
A.1.2 Test procedure.....	10
Annex B (normative) Test methods and requirements for loungers	11
B.1 Introduction	11
B.2 Strength tests	12
B.2.1 Test procedure	12
B.3 Stability	15
B.3.1 Test procedure	15
B.4 Test sequence and test parameters.....	17
B.5 Requirements	18
B.5.1 General safety requirements	18
B.5.2 Stability requirements	18
B.5.3 Mechanical safety requirements	18
Annex C (informative) Purchase information (Guideline)	19

Foreword

This document (EN 581-2:2009) has been prepared by Technical Committee CEN/TC 207 "Furniture", the secretariat of which is held by UNI.

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 2009, and conflicting national standards shall be withdrawn at the latest by October 2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes ENV 581-2:2000

This text is one part of a general standard concerning safety and performance requirements for outdoor seating and tables.

The work programme of CEN/TC 207/WG4 includes the following parts:

- | | |
|--------------|---|
| EN 581-1 | Outdoor furniture – Seating and tables for camping, domestic and contract use – Part 1: General safety requirements |
| EN 581-3 | Outdoor furniture – Seating and tables for camping, domestic and contract use – Part 3: Mechanical safety requirements and test methods for tables |
| CEN/TR 581-4 | Outdoor furniture – Seating and tables for camping, domestic and contract use – Part 4: Requirements and test methods for durability under the influence of climatic conditions |

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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 document does not apply to outdoor furniture for severe contract use, where higher requirements may be necessary nor to removable upholstery and coverings, permanently fixed furniture and street furniture.

The test requirements contained within this European Standard are based on use by persons weighing up to 110 kg.

Information regarding ageing and degradation caused by light, temperature and moisture has not been included.

Annex A (normative) specifies additional test methods for seating with multi-position back rests.

Annex B (normative) specifies test methods for loungers.

Annex C (informative) specifies guidelines for purchase information.

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 581-1, *Outdoor furniture – Seating and tables for camping, domestic and contract use – Part 1: General safety requirements*

EN 1022:2005, *Domestic furniture – Seating – Determination of stability*

EN 1728:2000, *Domestic furniture – Seating – Test methods for the determination of strength and durability*

3 Terms and definitions

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

3.1

outdoor seating for contract use

outdoor seating intended for non-private use in places with public access, such as restaurants, open-air swimming pools, beaches, vocational and leisure sites

3.2

outdoor seating for domestic use

outdoor seating intended for private use in places use without public access such as gardens, winter gardens, terraces, balconies etc.

3.3

outdoor seating for camping use

outdoor seating foldable or knock-down and light-weight, intended for use in connection with camping and travelling

3.4

stool

seating without back rest, or with the top of the back rest less than 100 mm from the seat

3.5

multi-position chair

chair with a back rest adjustable in inclination and with fixed or adjustable seat

3.6

bench

multi-place seating with or without back rest, with or without arm rests

3.7

lounger

seating without wheels intended for reclined posture

3.8

mobile lounger

lounger supplied with wheels and possibly handles

3.9

foot rest

part intended to support the feet of the sitter

NOTE A foot rest may be permanently attached to the structure of the seating.

3.10

leg rest

extension of the seat area intended to support the legs of the sitter

NOTE A leg rest may be permanently attached to the seat.

4 General test conditions

The preliminary preparation shall be as specified in EN 1728 with the exception of conditioning time which shall be at least 24 h, instead of one week.

With the exception of seating with a seat and back made of one piece of flexible material (e.g. textile), attached at the upper and lower edges only, seat and back loading points shall be determined according to EN 1728.

For seating with a seat and back made of one piece of flexible material (e.g. textile), attached at the upper and lower edges only, the loading point shall be the lowest point when a rolling cylinder (5.1) is placed in the chair.

The tests are described in terms of the application of forces. Masses can however be used. The relationship $10\text{ N} = 1\text{ kg}$ may be used for this purpose.

5 Test equipment and apparatus

5.1 Rolling cylinder

For seating with seat and back made of one piece of flexible material (e.g. textile) the loading position template shall be a cylinder with a mass of $(1 \pm 0,5)\text{ kg}$ and a diameter of $(70 \pm 10)\text{ mm}$.

NOTE For example a suitable length of the cylinder is 200 mm.

5.2 Test floor

Horizontal, flat and rigid with a smooth surface.

NOTE Some examples of test floor complying with the definition: plastics laminate, bakelite board, steel.

6 Test methods and requirements

6.1 Testing, general

The tests shall be carried out in the order in which they are presented in Table 1 of this standard.

The additional test method for multi-position back rests is specified in Annex A.

Test methods and requirements for loungers are specified in Annex B.

6.1.1 Stability

Carry out the applicable tests according to EN 1022 (see Table 1).

6.1.2 Test sequence and test parameters

Table 1 — Test sequence and test parameters

Test and sequence		Reference	Test parameters			
				Camping	Domestic	Contract
1	Seat and back static load test ^a	EN 1728:2000, 6.2.1	Seat: force, N 10x10 s (±2s) + 1x30 min (±10 s) Back: force, N 10x10 s (±2s) + 1x30 min (±10 s)	1100 -	1600 410	2000 560 max
2	Seat front edge static load test	EN 1728:2000, 6.2.2	Force, N 10x10 s (±2) + 1x30 min (±10 s)	1100	1300	1300
3	Seat and back fatigue test for seating ^a	EN 1728:2000, 6.7	Cycles Seat: force, N Back: bending moment, N.m	12 500 1000 75 max	25 000 1000 100 max	50 000 1000 100 max
4	Fatigue test on back rest mechanism	See Annex A	Cycles Seat load, kg Force, N Back: bending moment, N.m	5 000 100 190 75	10 000 100 250 100	20 000 100 250 100
5	Arm downwards static load test	EN 1728:2000, 6.6	Vertical force, N	-	700	900 ^b
6	Arm fatigue test	EN 1728:2000, 6.10	Cycles Force, N	5 000 400	10 000 400	30 000 400
7	Leg forward static load test	EN 1728:2000, 6.12	Seat load, kg Horizontal force, N	75 250	75 300	100 400
8	Leg sideways static load test	EN 1728:2000, 6.13	Seat load, kg Horizontal force, N	75 200	75 300	100 300
9	Seat impact test ^c	EN 1728:2000, 6.15	Drop height, mm 10 times	140	180	180
10	Foot rail static test for high seating	EN 1728:2000, 6.4	Vertical force, N	-	1000	1200
11	Forward stability ^{d e}	EN 1022				
12	Rearward stability ^d	EN 1022				
13	Sideways stability ^{d e}	EN 1022				

^a If seat and back are of one piece of flexible material (e.g. textile), only the tests on seat shall be carried out.

^b If arm rest is less than 15 mm wide, carry out test with 700 N for contract use.

^c The application point shall be at least 100 mm from the front edge. This test shall not be carried out on seating with a seat height > 600 mm.

^d In the case of seating which might not fulfil the stability requirements before carrying out any tests, the applicable stability tests may be carried out before starting the sequence of tests specified in this table.

^e This test is not applicable for seating with a seat height < 200 mm and a mass < 5 kg. The height shall be determined by measuring from the floor to the upper seating area on the geometrical centre of the unloaded seat.

6.2 Requirements

6.2.1 General safety requirements

The general safety requirements specified in EN 581-1 shall be fulfilled.

6.2.2 Stability requirements

The stability requirements specified in EN 1022 shall be fulfilled.

6.2.3 Mechanical safety requirements

The requirements are fulfilled during and after testing in accordance with Table 1 when:

- a) there are no fractures of any joint, member or component;
- b) there is no loosening of joints intended to be rigid;
- c) the seating fulfils its function after removal of the test loads.

7 Instruction for use

7.1 General

Instruction for use shall be provided in the language(s) of the country where the tables are sold. These instructions shall be headed "IMPORTANT, RETAIN FOR FUTURE REFERENCE: READ CAREFULLY" in letters no less than 5 mm high.

These instructions shall include at least the following:

- a) name and address of the producer (manufacturer or supplier);
- b) information regarding maintenance;
- c) conditions for use of the product (camping, domestic or contract).

7.2 Marking for mobile loungers

All mobile loungers not intended to be lifted and moved under the load specified in Table B.1 shall be marked with a pictogram as an example is shown in Figure 1.

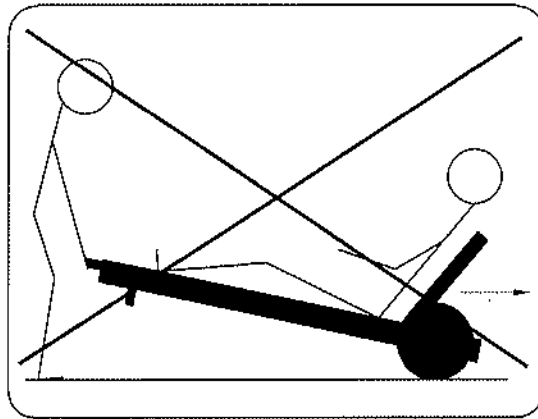


Figure 1 — Example of pictogram for mobile loungers not intended to be moved when loaded

8 Test report

The test report shall include the following information:

- a) reference to this part of the European Standard;
- b) details of piece of furniture tested;
- c) use of the product (Camping, Domestic or Contract);
- d) any defects observed before testing;
- e) test results according to the applicable clauses;
- f) compliance with the requirements;
- g) details of any deviations from this European standard;
- h) name and address of the test facility;
- i) date of test.

Annex A (normative)

Additional test method for seating with a multi-position back rest

A.1 Fatigue test on back rest mechanism

This test is only applicable to seating with a multi-position back rest.

A.1.1 Purpose of the test

The purpose of the test is to validate the safety of the mechanism used to change the position of the back rest.

A.1.2 Test procedure

Place the seating in normal use position, with the feet secured to prevent sliding, and with the back rest in the most adverse position. If the most adverse position can not be determined, carry out the test with the back rest in the mid position.

Load the seat at the seat loading point determined by point A of the template, with the seat load specified in Table 1.

The height of the back rest loading points shall be 400 mm above the seat loading point determined according to 4.3 of EN 1728:2000. They shall be 50 mm from the right and left outer edges of the back rest.

Apply rearwards alternating forces perpendicularly to the back rest, as specified in Table 1 (or Table B.1 for loungers).

If it is not possible to load the specified points, the bending moment specified in Table 1 (or Table B.1 for loungers) shall remain constant, i.e. the force applied on the back rest shall be increased proportionately to the decrease in loading point height.

Carry out the test for the number of cycles specified in Table 1, with the force maintained for (2 ± 1) s.

1 cycle = 1 application of force on the right side and 1 application of force on the left side.

Annex B (normative)

Test methods and requirements for loungers

B.1 Introduction

Loungers combine, by their nature and design, the use of sitting and lying rest. Due to their extended length, they invite a second person to sit. Therefore, they shall be tested for all of these functions individually and in combination.

Any extension of the seat section to the full length of the lounger shall meet the requirements as specified below. Loungers without a particular seat section, (i.e. those without back rest and arm rest), shall be tested as specified below.

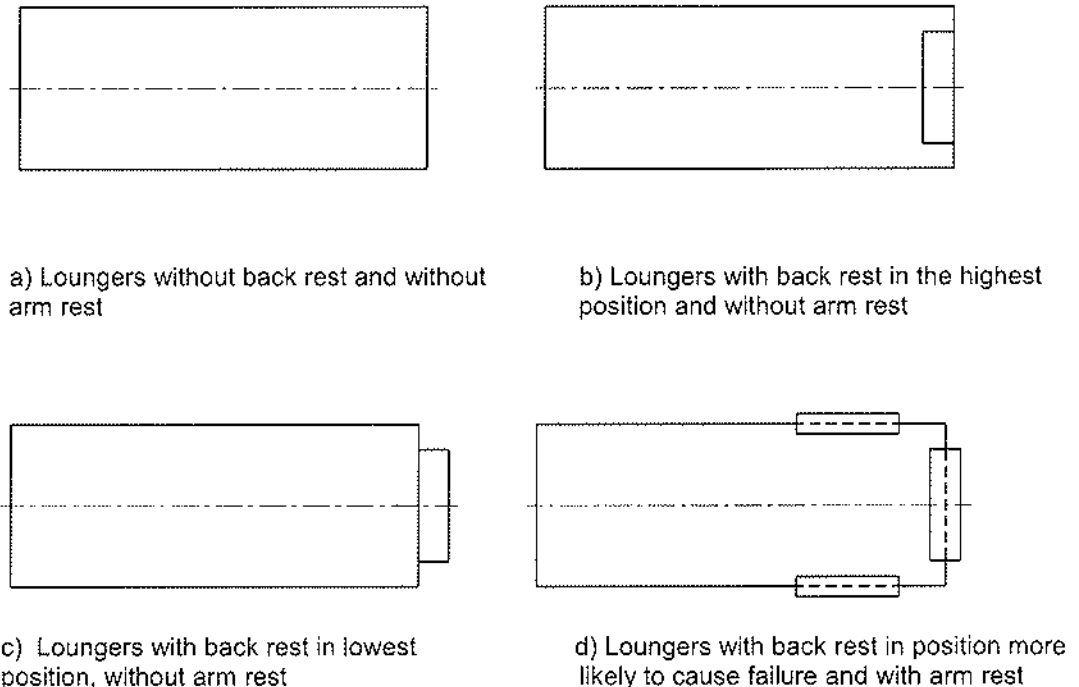


Figure B.1 — Pictograms used in this annex

The tests shall be carried out in the order they are presented in this Annex.

NOTE In the case of loungers which might not fulfil the stability requirements before carrying out any tests, the applicable stability tests may be carried out before starting the sequence of tests specified in this Annex.

B.2 Strength tests

B.2.1 Test procedure

B.2.1.1 Seat and back static load test

All adjustable parts shall be put in the position most likely to cause failure.

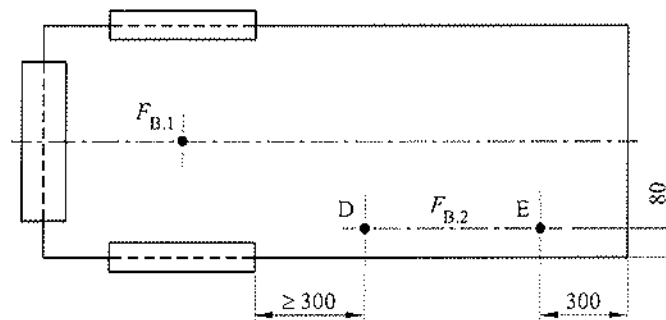
Apply the downwards force $F_{B,1}$ at the seat loading point determined according to 4.3 of EN 1728:2000 (point A) and simultaneously the downwards force $F_{B,2}$ at the most adverse position between point D and E specified in Figure B.2.

Apply forces for the number of cycles $n_{B,1}$ as specified in Table B.1.

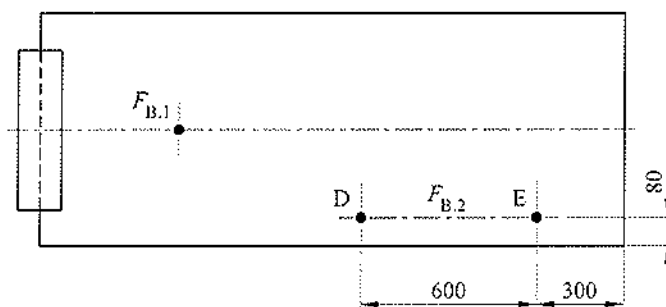
The back rest test procedures are specified in EN 1728:2000 clauses 6.2.1 and 6.3, and the parameters are specified in Table B.1.

NOTE For a simplified test procedure the seat and back static load test may be performed by carrying out the seat test followed by the back test with a static load on the seat.

Dimensions in millimetres



a) lounger with arm rest



b) lounger without arm rest

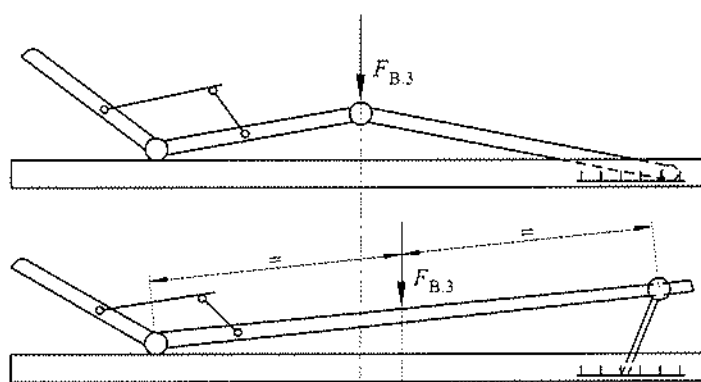
Figure B.2 — Static test

B.2.1.2 Seat and back fatigue test

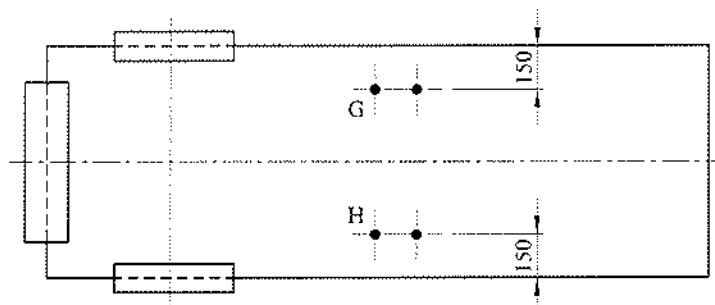
B.2.1.2.1 Seat fatigue test procedure

Apply downwards forces $F_{B,3}$ for (2 ± 1) s for the number of cycles n_{B2} , as specified in Table B.1, in alternating order (50% of cycles at G and 50% at H) (see Figure B.3). The points of application in longitudinal direction as well as any position of adjustable parts shall be in a position most likely to cause failure.

Dimensions in millimetres



a) examples 1 and 2



b) top view to examples 1 and 2

Figure B.3 — Seat fatigue test

B.2.1.2.2 Back fatigue test procedure

The back rest test procedure is specified in EN 1728:2000 clauses 6.7 and 6.9 and the parameters are specified in Table B.1.

B.2.1.3 Fatigue test on back rest mechanism

The back rest mechanism fatigue test procedure is specified in Annex A, and the parameters are specified in Table B.1.

B.2.1.4 Arm downwards static load test

The arm downwards static load test procedure is specified in EN 1728:2000 clause 6.6, and the parameters are specified in Table B.1.

B.2.1.5 Arm fatigue test

The arm fatigue test procedure is specified in EN 1728:2000 clause 6.10, and the parameters are specified in Table B.1.

B.2.1.6 Seat impact test

With the exception of the application points which are specified below, the impact test procedure is specified in EN 1728:2000 clause 6.15 and the parameters are specified in Table B.1.

The application points shall be on the lying section and, if applicable, on foot end locking mechanisms (see Figure B.4).

The points of impact shall be in the longitudinal direction of seating-lying section, on the points most likely to cause failure and directly above the locking mechanisms.

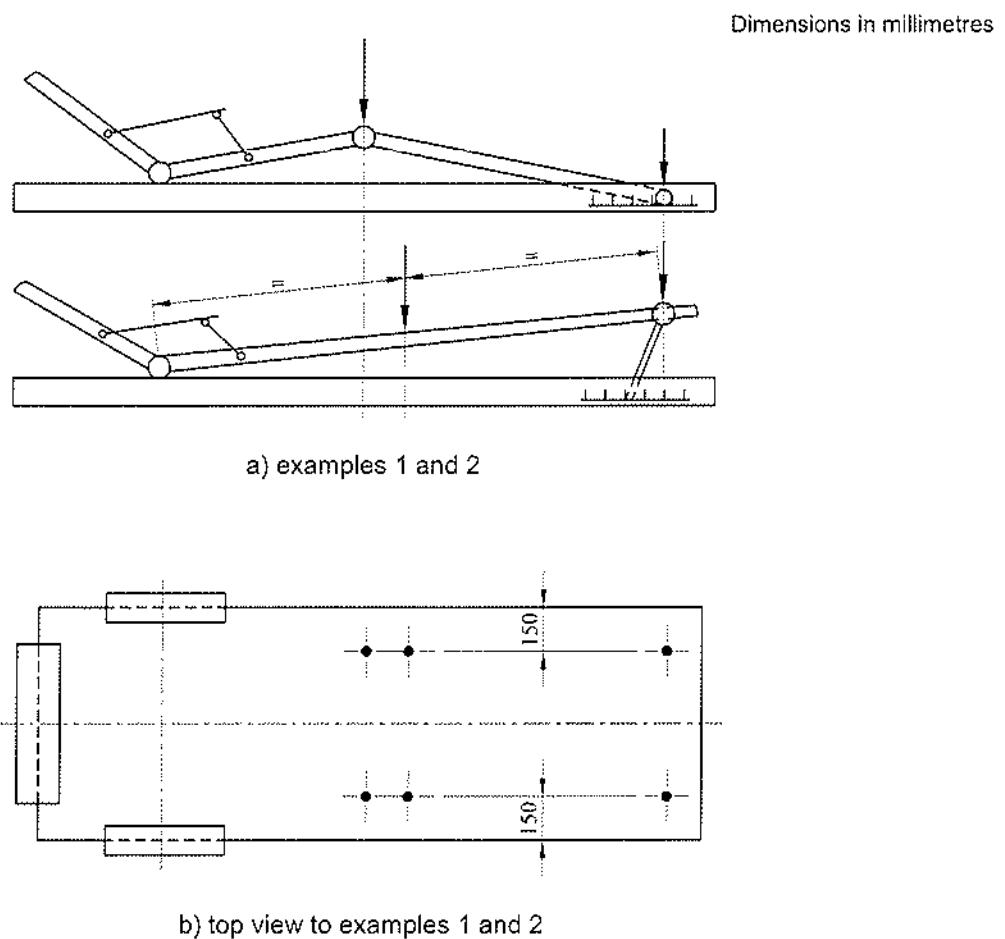


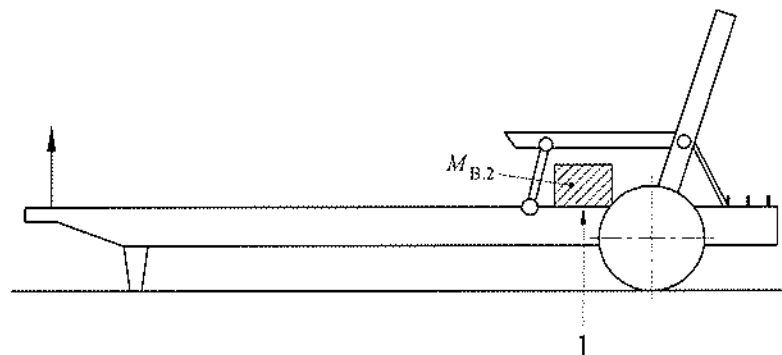
Figure B.4 — Impact test

B.2.1.7 Lifting test for mobile loungers

Mobile loungers not being marked with the pictogram as specified in 7.2 shall be tested as shown in Figure B.5.

Apply the load $M_{B.2}$ as specified in Table B.1 on the geometrical centre line of the lounger surface. The area of contact of load $M_{B.2}$ shall have a diameter of (350 ± 50) mm. Lift the foot end of the lounger for the number of cycles $n_{B.4}$, specified in Table B.1 up to a height so that only the wheels are in contact with the floor surface.

Dimensions in millimetres



Key

- 1 Point A, as defined in 4.3 of EN 1728:2000

Figure B.5 — Lifting test

B.3 Stability

B.3.1 Test procedure

B.3.1.1 Sideways stability

The seat loading points shall be on a line 60 mm from the side, the first point shall be 300 mm from the front, the others each 600 mm if the distance from the armrest or the rear edge of the lounger is at least 300 mm.

The forces are applied using the loading pad defined in 4.2 of EN 1022:2005.

If the arm rest is more than 400 mm in length apply additional vertical force $F_{B.5}$ in the centre of it.

Apply simultaneously the downwards forces $F_{B.4}$ on seat as specified in Table B.1 and the load on the arm rest.

Maintain forces for 5 s.

Dimensions in millimetres

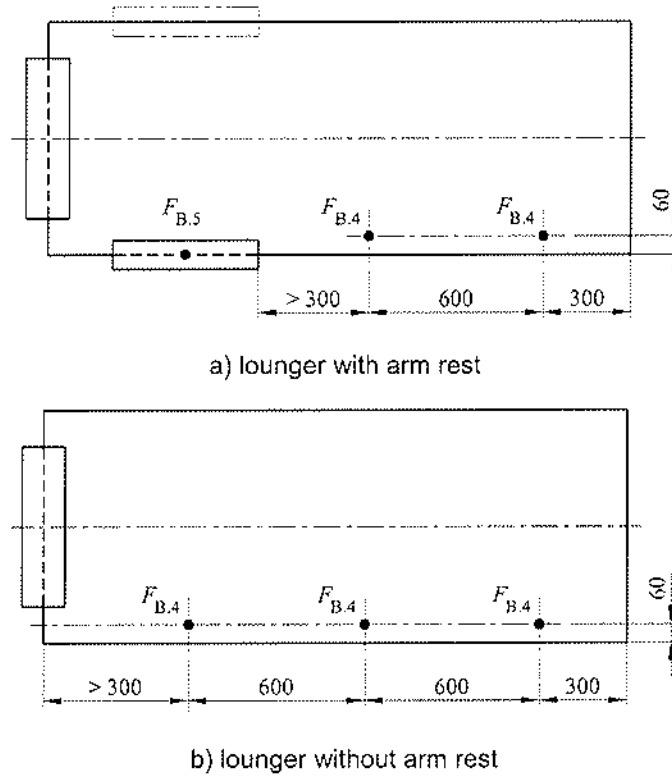


Figure B.6 — Example of application points for sideway stability

B.3.1.2 Forward stability

Apply the downwards force $F_{B.6}$ as specified in Table B.1 (see Figure B.7). Maintain $F_{B.6}$ for 30 s minimum.

Dimensions in millimetres

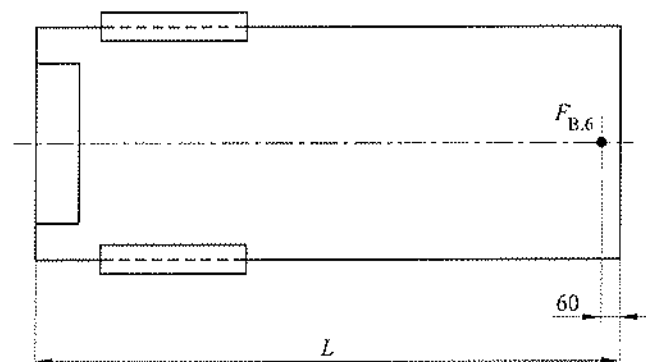


Figure B.7 — Forward stability

B.4 Test sequence and test parameters

Table B.1 — Test sequence and test parameters

Test and sequence	Reference	Test parameters				
			Camping	Domestic	Contract	
1	Seat and back static load test	B.2.1.1 and EN 1728:2000, 6.2.1	Seat: force $F_{B,1}$, N 600 $n_{B,1}$: 10x10 s (± 2 s) + 1x30 min (± 10 s) Back: force, N - 10x10 s (± 2 s) + 1x30 min (± 10 s)	1100 1600 410	2000 900 560 max	
2	Seat and back fatigue test for seating	B.2.1.2 and EN 1728:2000, 6.7	Cycles, $n_{B,2}$ Seat: force $F_{B,3}$, N Back: bending moment, N.m	12 500 750 75 max	25 000 1000 100 max	50 000 1000 100 max
3	Fatigue test on back rest mechanism	B.2.1.3 and Annex A	Cycles Seat load, kg Force, N Back: bending moment, N.m	5 000 100 190 75	10 000 100 250 100	20 000 100 250 100
4	Arm downwards static load test	EN 1728:2000, 6.6	Vertical force, N	-	700	900 ^a
5	Arm fatigue test	EN 1728:2000, 6.10	Cycles Force, N	5 000 400	10 000 400	30 000 400
6	Seat impact test	B.2.1.6 and EN 1728:2000, 6.15	Drop height, mm 10 times	140	180	180
7	Lifting test	B.2.1.7	Masse $M_{B,2}$, kg Cycles $n_{B,4}$	100 500	100 1000	100 2000
8	Sideways stability ^{b c}	B.3.1.1	Force $F_{B,4}$, N Force $F_{B,5}$, N	600 250	600 250	600 250
9	Forward stability ^{b c}	B.3.1.2	Force $F_{B,6}$, N	600	600	600
<p>^a If arm rest is less than 15 mm wide, carry out test with 700 N for contract use.</p> <p>^b In the case of seating which might not fulfil the stability requirements before carrying out any tests, the applicable stability tests may be carried out before starting the sequence of tests specified in this table.</p> <p>^c This test is not applicable for seating with a seat height < 250 mm and a mass < 5 kg. The height shall be determined by measuring from the floor to the upper seating area at L/2 on the centre line of the unloaded lounge.</p>						

B.5 Requirements

B.5.1 General safety requirements

The general safety requirements specified in EN 581-1 shall be fulfilled.

B.5.2 Stability requirements

For sideways and forward stability, when loaded, the lounger shall not overturn.

B.5.3 Mechanical safety requirements

The requirements are fulfilled during and after testing in accordance with Table 1 when:

- 1) there are no fractures of any joint, member or component;
- 2) there is no loosening of joints intended to be rigid;
- 3) the seating fulfils its function after removal of the test loads.

Annex C (informative)

Purchase information (Guideline)

To allow the consumer to select a product that will be suitable for the intended use prior to purchase, purchase information should be available without the need to open any package. This should include:

- a) identification of the product;
- b) product characteristics such as dimensions, storage information, maintenance...;
- c) conditions for use of the product (camping, domestic or contract).

NOTE This list is not complete and both EU and national regulation exist on this subject.

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