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Furniture — Ranked seating — Requirements for safety, strength and durability

National foreword

This British Standard is the UK implementation of EN 12727:2016. It supersedes BS EN 12727:2000 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee FW/0/2, Domestic and Contract Furniture.

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

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Furniture - Ranked seating - Requirements for safety, strength and durability

Ameublement - Sièges en rangées - Exigences de
sécurité, de résistance et de durabilité

Möbel - Festmontiertes Reihengestühl - Anforderungen
an die Sicherheit, Festigkeit und Dauerhaltbarkeit

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European foreword

This document (EN 12727:2016) 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of an identical text or by endorsement, at the latest by May 2017, and conflicting national standards shall be withdrawn at the latest by May 2017.

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

This document supersedes EN 12727:2000.

The main changes in the document are to reference the revised standard EN 1728:2012.

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1 Scope

This European Standard specifies requirements determining the safety, structural strength and durability of all types of seating that are permanently fastened to the floor and/or wall, whether in bench or individual seat form.

This standard does not apply to linked seating not fastened to the floor and/or walls and street furniture.

It does not include requirements for resistance to ageing, degradation, flammability, the effect of ambient temperature and the durability of upholstery materials.

The standard has two annexes:

- Annex A (normative) Additional test methods;
- Annex B (informative) Test severity in relation to application.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1728:2012, *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
accessible part**
part to which access can easily be gained by the user when the seating is in the intended configuration of use and for which the probability of intentional user contact is high

**3.2
shear and squeeze points**
shear and squeeze points exist if the distance between two accessible parts moving relatively to each other is less than 18 mm and more than 7 mm for adults in any position during movement

**3.3
structure**
load bearing parts of furniture such as the frame, seat, back and arm supports and suspension

**3.4
auxiliary writing surface**
small work surface for writing or similar activities

4 Test conditions

General test conditions shall be in accordance with EN 1728:2012, Clause 4.

5 Safety, strength and durability

5.1 General requirements

The seating shall be so designed as to minimize the risk of injury to the user.

All accessible parts (3.1) shall be so designed that physical injury and damage are avoided.

This requirement is met when:

- a) accessible corners and edges are rounded or chamfered;
- b) all other corners and edges are free from burrs and sharp edges;
- c) ends of hollow components with a diameter greater than 7 mm and less than 12 mm, where the accessible depth is greater than 10 mm, are closed or capped.

Movable and adjustable parts shall be designed so that injuries and inadvertent operation are avoided.

It shall not be possible for any load bearing part of the seating to come loose unintentionally.

All parts which are lubricated to assist sliding shall be designed to protect users from lubricant stains when in normal use.

5.2 Shear and squeeze points

5.2.1 Shear and squeeze points when setting up and folding

Unless 5.2.2 or 5.2.3 are applicable, shear and squeeze points that are created only during setting up and folding, including tipping seat actions, are acceptable, because the user can be assumed to be in control of his/her movements and to be able to cease applying the force immediately upon experiencing pain.

The edges of parts moving relative to each other and creating shear and squeeze points shall be as specified in 5.1.

5.2.2 Shear and squeeze points under influence of powered mechanism

With the exception of tipping seats, there shall be no shear and squeeze points created by parts of the seating operated by powered mechanisms, e.g. springs and gas lifts.

5.2.3 Shear and squeeze points during use

There shall be no shear and squeeze points created by forces applied during normal use, see Table 1.

There shall be no shear and squeeze points if a hazard is created by the weight of the user during normal movements and actions, e.g. by adjusting the backrest.

NOTE This hazard is best prevented by the use of automatic locking mechanisms.

5.3 Strength and durability

5.3.1 General

Seating shall be tested for strength and durability according to the order of Table 1.

The guidance for selecting test severity with due respect for the end use of the product is given in Annex B.

For multiple seating units, all seats not undergoing testing shall be loaded with 950 N when required by EN 1728:2012.

Table 1 — Strength and durability Tests

TEST	REFERENCE	LOADING	TEST SEVERITY			
			1	2	3	4
1. Seat static load and back static load test	EN 1728:2012 6.4	seat force, N back force ^a , N cycles	1300 560 10	1600 760 10	2000 760 10	2000 760 10
2. Seat front edge static load	EN 1728:2012 6.5	seat force, N cycles	1300 10	1600 10	2000 10	2000 10
3. Horizontal forward static load test on back rests	EN 1728:2012 6.7	force, N cycles	- -	- -	760 10	760 10
4. Vertical load on back rests	EN 1728:2012 6.6	force, N cycle	- -	600 10	900 10	900 10
5. Arm rest sideways static load test	EN 1728:2012 6.10	force, N cycles	400 10	600 10	900 10	1000 10
6. Arm rest downwards static load test	EN 1728:2012 6.11	force, N cycles	800 10	900 10	1000 10	1000 10
7. Combined seat and back durability test	EN 1728:2012 6.17	cycles seat load, N back load, N	50000 1000 330	100000 1000 330	150000 1000 330	200000 1000 330
8. Seat front edge durability test	EN 1728:2012 6.18	cycles seat load, N	50000 800	100000 800	150000 800	200000 800
9. Horizontal forward durability test on back rests	A.1	cycles back load, N	- -	20000 330	50000 330	100000 330
10. Arm rest durability test	EN 1728:2012 6.20	cycles force, N	- -	30000 400	50000 400	100000 400
11. Seat impact test	EN 1728:2012 6.24	drop height, mm cycles	180 10	240 10	300 10	300 10
12. Back impact test	EN 1728:2012 6.25	height, mm angle, degrees cycles	210 38 10	330 48 10	620 68 10	620 68 10
13. Arm rest impact test	EN 1728:2012 6.26	height, mm angle, degrees cycles	210 38 10	330 48 10	620 68 10	620 68 10
14. Tipping seat operation	EN 1728:2012 6.23	cycles	25000	25000	50000	100000
15. Vertical static test on auxiliary writing surfaces	EN 1728:2012 6.14	force, N cycles	200 10	200 10	300 10	300 10
16. Auxiliary writing surfaces durability test	EN 1728: 2012 6.22	cycles force, N	10000 150	10000 150	25000 150	25000 150

^a A minimum back force not required as seating is affixed to floor and/or wall and will not overturn

5.3.2 Requirements

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

- a) there are no fractures of any member, joint or component;
- b) there are no loosening of joints intended to be rigid;
- c) the seating fulfils its functions;
- d) the seating fulfils the safety requirements contained in 5.1 and 5.2.

6 Information for use

Information for use shall be available in the language of the country in which it will be delivered to the end user. It shall contain at least the following details:

- a) Information regarding the intended use, see Annex B;
- b) Assembly instructions, where applicable;
- c) Instruction for the maintenance of the item of seating.

7 Test report

The test report shall include at least the following information:

- a) a reference to this European Standard;
- b) the piece of furniture tested;
- c) details of defects observed before testing;
- d) any variation from the specified temperature range;
- e) the test results;
- f) test severity used;
- g) the name and address of the test facility;
- h) the date of test.

Annex A (normative)

Additional test methods

A.1 Horizontal forwards durability test on back rests

A.1.1 General test conditions

General test conditions shall be in accordance with EN 1728: 2012, Clause 4.

A.1.2 Test Procedure

The horizontal force as specified in Table 1 shall be applied acting forwards using the smaller seat loading pad (EN 1728: 2012, 5.6) 50 mm below the centre of the top of the back of one end seat only. The force shall be applied for the number of cycles specified in Table 1.

Annex B
(informative)

Test severity in relation to application

Table B.1 shows the type of use that might be expected from furniture in relation to the four test severities contained in Table 1.

It should be emphasized that there are applications where moderate usage can be combined with high frequency of use and vice versa. Therefore the precise nature of the intended use of a ranked seating installation should be carefully considered before selecting the appropriate loads and cycles from Table 1.

Table B.1 — Test severity in relation to application

Test severity	Type of Use	Application
1	light	Churches, Law courts
2	moderate	Theatres, Concert halls, Company lecture rooms
3	general	Stadium, Sports halls, Theatres, Cinemas, Concert Halls
4	severe	College lecture rooms, Stadium, Cinemas, Airports

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