
Bivalna počitniška vozila - Prikolice - 1. del: Zdravstvene in varnostne zahteve za bivanje

Leisure accommodation vehicles - Caravans - Part 1: Habitation requirements relating to health and safety

Bewohnbare Freizeitfahrzeuge - Caravans - Teil 1: Anforderungen an den Wohnbereich hinsichtlich Gesundheit und Sicherheit

Véhicules habitables de loisirs - Caravanes - Partie 1 : Exigences d'habitation relatives à la santé et à la sécurité

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sécurité

Bewohnbare Freizeitfahrzeuge - Caravans - Teil 1:
Anforderungen an den Wohnbereich hinsichtlich
Gesundheit und Sicherheit

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 245.

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prEN 1645-1:2024 (E)**European foreword**

This document (prEN 1645-1:2024) has been prepared by Technical Committee CEN/TC 245 “Leisure accommodation vehicles”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1645-1:2018.

EN 1645, *Leisure accommodation vehicles — Caravans*, is currently composed with the following parts:

- *Part 1: Habitation requirements relating to health and safety;*
- *Part 2: User payload* (is withdrawn)

prEN 1645-1:2024 includes the following significant technical changes with respect to EN 1645-1:2018:

- a) requirements for caravans with an area greater than 6,5 m² included throughout the document;
- b) requirements for escape path (12.1.2) modified;
- c) requirement for size of step under escape window included in 12.1.6;
- d) change from “flammable” to “combustible”;
- e) amendment of Clause 5.2 “rigidity”;
- f) amendment of Clause 5.3 “Corner steadies”;
- g) amendment of Clause 5.5.1 “Heights”;
- h) amendment of Clause 5.6 “Doors” referring the dimensions;
- i) Clause 6.1.3 “Clearance of drop-down bunks” added;
- j) amendment of Clause 6.1.4.3 “Protection by curtains or nets”;
- k) amendment of Clause 6.1.7 “Access to high level bunks”;
- l) amendment of Clause 7 “Drinking water supply, storage and disposal of waste water”;
- m) amendment of Clause 8.1 “Installation of appliances”;
- n) amendment of Clause 12.2.1 “Rigid or guided elements”;
- o) amendment of Annex A “Rigidity test”
- p) amendment of Annex F “Clear height over bunks”;
- q) amendment of Annex C “Strength of entrance steps”;
- r) amendment of test equipment for load spreading platform for bunks (N.5).

Introduction

Figure 1 gives an overview of the relevant standards for caravans, motor caravans and caravan holiday homes.

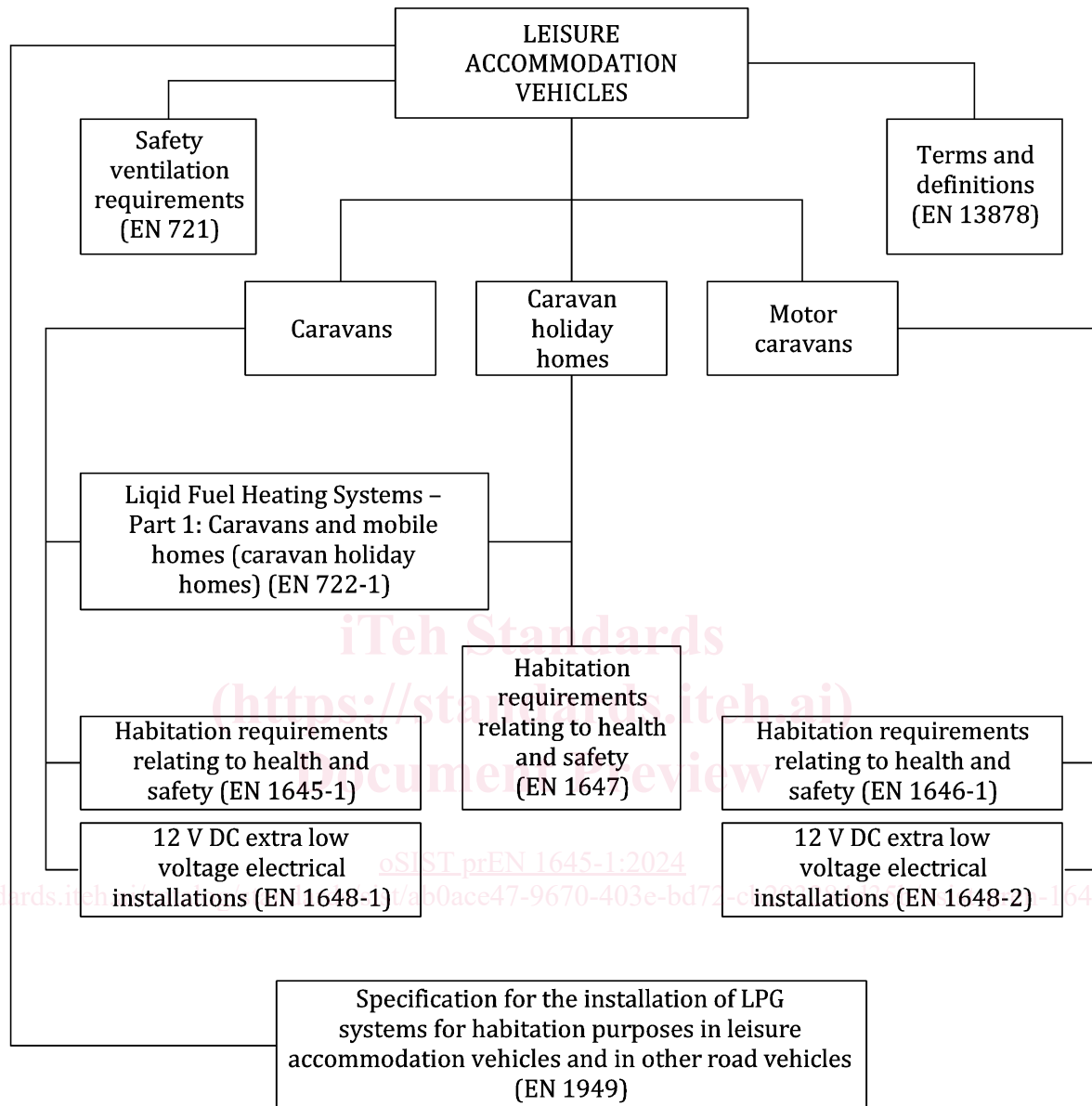


Figure 1 — Overview of relevant standards applying to leisure accommodation vehicles

prEN 1645-1:2024 (E)**1 Scope**

This document specifies requirements intended to ensure the safety and health of people when they use caravans for temporary or seasonal habitation.

It also specifies the corresponding test methods.

Requirements applicable to road safety are not included in the scope of this document.

This document is applicable exclusively to rigid and rigid folding caravans as defined in EN 13878.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 3-7, *Portable fire extinguishers — Part 7: Characteristics, performance requirements and test methods*

EN 721, *Leisure accommodation vehicles — Safety ventilation requirements*

EN 722-1, *Leisure accommodation vehicles — Liquid fuel heating systems — Part 1: Caravans and caravan holiday homes*

EN 1648-1, *Leisure accommodation vehicles — 12 V direct current extra low voltage electrical installations — Part 1: Caravans*

EN 1949, *Specification for the installation of LPG systems for habitation purposes in leisure accommodation vehicles and accommodation purposes in other vehicles*

EN 13878, *Leisure accommodation vehicles — Terms and definitions*

EN 13501-1:2018, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN ISO 8936, *Awnings for leisure accommodation vehicles — Requirements and test methods (ISO 8936)*

HD 60364-7-721, *Low-voltage electrical installations — Part 7-721: Requirements for special installations or locations — Electrical installations in caravans and motor caravans (IEC 60364-7-121)*

ISO 4649:2017, *Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13878 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp/>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Testing

The tests described in Annex A to Annex M are intended to verify that a caravan representative of a given model, including its fixtures and fittings, meets the requirements of this European Standard.

These tests are intended to simulate the most onerous conditions for the relevant characteristics.

It is recommended to take environmental aspects into account during development, production and disposal of caravans based on established knowledge and within the respective technical possibilities (see also Annex O).

5 Design and construction

5.1 Occupancy

The manufacturer shall designate the occupancy as the number of berths, both standard berths and additional berths provided by the manufacturer and shall include it in the user's handbook. The occupancy is also needed to determine the ventilation requirements (see EN 721).

5.2 Rigidity

When stationary uncoupled from a towing vehicle, with the floor horizontal, an upward thrust of 1 500 N applied to one rear corner steady for a duration of 15 min shall not cause the caravan to distort to an extent that would make any door or window difficult to open.

Rigidity shall be tested in accordance with Annex A.

5.3 Corner steadies

Each caravan with a floor area greater than 6,5 m² be equipped with four steadies, one at each of its four corners. Each steady shall be retractable and adjustable in height. Each steady shall be capable, when extended, of carrying a load of not less than 25 % of the maximum technically permissible laden mass of the caravan. An appropriate operating tool shall be provided.

Each caravan equal to or less than 6,5 m² plan area be equipped with at least 2 rear steadies. Each steady shall be retractable and adjustable in height. Each steady shall be capable, when extended, of carrying a load of not less than 50 % of the maximum technically permissible laden mass of the caravan. An appropriate operating tool shall be provided.

A certificate, from the corner steady manufacturer or supplier shall accompany the caravan showing, either by calculation or by test, the loading capability of each type of corner steady.

5.4 Grab handles

Four external grab handles for manoeuvring the caravan shall be located externally to the body work, one on each side at the front and one on each side at the rear.

For those caravans with a maximum technically permissible laden mass not exceeding 750 kg, two grab handles at the front of the caravan one on each side are sufficient.

The hand clearance aperture of each grab handle shall be not less than 30 mm × 120 mm. The grab handles shall be tested according to Annex B.

There shall be no visible permanent deformation or loosening of the grab handle and/or of its fixings.

5.5 Entrance steps

5.5.1 Heights

When the entrance height of the caravan, measured at maximum technically permissible laden mass, and standing on horizontal ground with the floor level, exceeds 400 mm, the caravan shall either be fitted with an entrance step, attachable or integral with the structure of the caravan, or a separate entrance step(s) shall be provided. An integral entrance step can be either retractable, folding or fixed.

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The rise of the first tread shall not exceed 400 mm. The rise of any other tread shall not exceed 300 mm. It is recommended that the rise of the steps be equal.

5.5.2 Minimum tread dimensions

The minimum tread dimensions shall be:

- a) attachable or integral entrance steps: 150 mm going over a minimum, uninterrupted width of 320 mm;
- b) separate steps: 270 mm going over a minimum, uninterrupted width of 450 mm.

5.5.3 Mechanical strength

An entrance step and any fixing devices shall be capable of withstanding a force of 2 000 N applied to any surface area of 100 mm × 150 mm of the tread.

After application of this force for a period of 5 min, any permanent deformation caused shall not exceed 5 mm.

The strength of each step shall be tested in accordance with Annex C.

5.5.4 Slip resistance test**5.5.4.1 Attachable or integral step**

An attachable or integral step shall have a slip resistant surface.

The slip resistance shall be tested in accordance with Annex D.

5.5.4.2 Separate entrance step

A separate step shall have a slip resistant surface. The slip resistant surface shall be tested in accordance with Annex D after having fixed the feet or base of the step.

In addition, a separate step shall remain stable when tested in accordance with Annex E.

5.6 Doors**5.6.1 Dimensions**

Each exterior door opening for rigid caravans shall have a minimum clear height of 1 590 mm and a minimum clear width of 480 mm and corners of maximum radius of 90 mm. The locking system may intrude on the minimum width up to 30 mm and for a maximum height of 150 mm, regardless of the number of locks.

Each exterior door opening for rigid folding caravans shall have a minimum clear height of 1 300 mm and a minimum clear width of 480 mm and corners of maximum radius of 90 mm. The locking system may intrude on the minimum width up to 30 mm and for a maximum height of 150 mm, regardless of the number of locks.

Each exterior door opening for caravans equal to or less than 6,5 m² plan area which body does not allow a higher door, then a minimum clear height of 1 140 mm and a minimum clear width of 480 mm and corners of maximum radius of 90 mm. The locking system may intrude on the minimum width up to 30 mm and for a maximum height of 150 mm, regardless of the number of locks.

5.6.2 Securing doors

Each exterior door shall be fitted with a locking device capable of keeping it closed when subjected to all forces caused by the movement of the vehicle in normal traffic conditions.

Interior doors shall be capable of being kept in a fixed position, open or closed, in the above conditions.

5.7 Awning Rail

Any awning rail shall permit the correct fitting of an awning complying with EN ISO 8936.

6 Internal equipment

6.1 Bunks

6.1.1 Mattress and/or upholstery

Bunks shall be provided with mattresses or be upholstered.

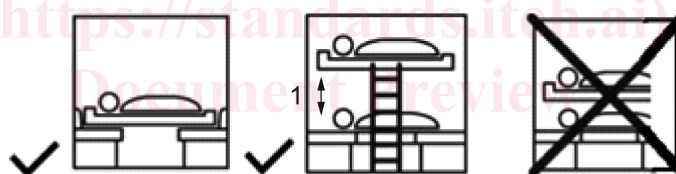
6.1.2 Clearance

For caravans over 6,5 m² plan area a clear height over 2/3 of the surface area of the bunk shall be not less than 500 mm when measured from the compressed surface of the mattress or upholstery in accordance with the test in Annex F.

For caravans equal to or less than 6,5 m² plan area a clear height over half of the surface area of the bunk shall not be less than 400 mm when measured from the compressed surface of the mattress or upholstery in accordance with Annex F.

6.1.3 Clearance of drop-down bunks

Where it is possible for a drop-down bunk to be lowered so that the clear height is not according to 6.1.2, then a label according to Figure 2, shall be affixed in a visible position close to the switch or operating mechanism to advise the customer of the risk of lowering the bunk when the lower bunk is in use.



Key

1 Minimum clear height

Figure 2 — Bunk information

6.1.4 Protection against falling out

6.1.4.1 General

High level bunks shall be protected on all sides to prevent the occupant from falling out. Any gap between one element of protection and another shall conform to 6.1.8. No gap shall exceed 75 mm.

All protections shall be secured against unintentional loosening.

High level bunks shall be provided with a label written in the language of the country where the caravan is to be first sold with the following wording:

“Not suitable for children under 6 years old without supervision”.

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6.1.4.2 Rigid protection

For rigid protection, the minimum height of the protection shall be at least 150 mm above the uncompressed upper surface of the mattress or upholstery. To allow entry, an access gap of 350 mm to 550 mm measured at its narrowest point shall be provided.

Where a rigid protection presents an apparent flexibility, its resistance shall be tested in accordance with Annex G.

A protection is considered as rigid if it is not bent more than 10 mm under a force of 100 N applied horizontally in the middle of the protection.

6.1.4.3 Protection by curtains or nets

Alternatively, the protection may be obtained by means of curtains or nets. The minimum height of the protection shall be at least 160 mm above the uncompressed upper surface of the mattress or upholstery, when the upper edge is loaded with 100 N in vertical direction downward.

To allow access to the bunk, the curtains or nets on at least one side of the bunk may be detachable, to enable an opening of at least 350 mm. If a permanent opening is provided for access, this opening shall be between 350 mm to 550 mm.

The curtains or nets shall be capable of resisting a force of 100 N applied horizontally towards the outside of the bunk for 15 s to any point and this shall not result in any tearing nor detaching nor creating any gap larger than 60 mm at the lower edge of the protection.

The strength of the curtains or nets shall be tested in accordance with Annex G.

Any gap created during the resistance test shall be measured in accordance with Annex K.

6.1.5 Mechanical strength

A force of 1 000 N applied vertically downwards, for 1 h, from the midpoint of each side member of any bunk where the upper surface of the compressed mattress or upholstery is placed at a height of more than 500 mm from the floor, shall neither cause permanent deformation of more than 5 mm of the frame of the bunk nor damage the fixing of the bunk to the structure of the caravan.

The mechanical strength shall be tested in accordance with Annex H.

6.1.6 Security of bunks

If a bunk is designed to fold away, it shall be secured against unintentional folding away.

If a bunk is designed to be stored during transportation, it shall be secured against unintentional movement when stored.

All bunks shall not unintentionally move. All bunks shall be tested in accordance with Annex I.

6.1.7 Access to high level bunks

A means of access to a high level bunk shall be provided, such as surfaces of furniture, foot holes in a solid component, handles or a ladder which shall be fixed or be able to be attached, to the bunk, in a safe manner.

The width of the treads between supports shall be at least 250 mm.

The distance between the top foothold and of the unloaded surface of the mattress, at the point of access, shall not be more than 400 mm.

When a ladder is used, the upper surfaces of the treads shall be equally spaced within a tolerance of ± 12 mm, and the unobstructed distance between consecutive treads shall be (225 ± 25) mm.

There shall be an unobstructed distance of ≥ 100 mm from the back surface of the tread to any obstruction and a clear height of 75 mm.

When tested in accordance with Annex J, the ladder shall not move when subjected to a downward static load of 1 000 N and a horizontal static load of 500 N; nor shall the ladder or its treads break or deflect permanently by more than 5 mm.

Where it is impractical to test the bunk ladder in the caravan, it is acceptable to test an identical configuration of the ladder, its method of fixing and its range of positions of use, outside the caravan according to Annex J.

6.1.8 Protection against entrapment

When ready for use, a bunk and its means of access shall not contain any open-ended tubing; nor shall there be projections, holes, loose washers, speed fixing nuts or crevices on which clothing or any part of the body could become snagged or trapped. Tension springs in the base structure are excluded. All edges, corners and projecting parts that are accessible shall be free from burrs and sharp edges.

If the base of a bunk is not covered by permanently fixed upholstery, any gap in the base not covered by the mattress shall not permit the passage of the cone (see K.1) beyond the point at which the diameter of the cone is 75 mm, when measured in accordance with K.2.

Any other gap or space within the structure of the bunk which is accessible from the upper surface of the bunk, including mattress where applicable, shall be between 12 mm and 25 mm or between 60 mm and 75 mm, (tested in accordance with K.3) or equal to or larger than 200 mm.

When a gap cannot be tested because a constructional feature prevents proper positioning of the cone, the constructional feature may be removed to the extent necessary to allow the tests to be carried out.

6.2 Cupboards

Bases of cupboards and shelves in cupboards at more than 1 000 mm from the floor of the vehicle at the place of measurement shall be provided with means to prevent their contents from sliding off.

Protection shall be appropriate for the items likely to be stored in the cupboards. Where an up-stand or lip is used as the method of protection, then this should be a minimum height of 5 mm.

6.3 Cooking appliance

A cooking appliance shall be installed.

7 Drinking water supply, storage and disposal of waste water

7.1 Couplings for drinking water supply

If couplings for drinking water supply are installed, they shall be accessible from the outside of a caravan. Access can be through an opening door or flap. A sealing off cover secured to the coupling or adjacent to it shall be supplied for each coupling.

7.2 Drinking water

7.2.1 Tanks

Water tanks shall be capable of being completely drained and cleaned.

7.2.2 Materials

All materials in contact with water intended for human consumption shall not impair the drinking water quality.

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NOTE All materials that are designed to come into contact with drinking water, attention is drawn to the requirements of Article 11 of Directive (EU) 2020/2184 on the quality of water intended for human consumption and local and national requirements for the country of first destination.

7.2.3 Marking

The drinking water filling points shall be clearly identified in blue.

7.3 Waste water disposal tank

When a drinking water tank is fixed in the caravan, one (or more) waste water tank(s) of total capacity at least equal to 50 % of the drinking water tank capacity shall be provided. Any waste water tank shall be either fixed or moveable and it shall be capable of being flushed and cleaned. If moveable, a storage area shall be provided.

7.4 Toilet waste disposal**7.4.1 Discharge systems**

Discharge from a toilet shall be collected in a closed system and shall not be discharged into a waste water disposal system. Any fixed tank intended to receive discharge from a toilet shall be fitted with a level indicator or early warning device that will indicate to the user that the tank will require emptying after a further three or four uses.

7.4.2 Outlets and couplings from toilet waste holding tanks

The internal diameter of a coupling taking discharge from a toilet-holding tank shall be a minimum of 70 mm. It shall have a secure detachable connection to receive a 75 mm minimum internal diameter hose and a 1 500 mm minimum length of such hose shall be provided.

When a macerator is fitted the internal diameter may be reduced to 32 mm.

These requirements do not apply to toilets with removable toilet waste holding tanks.

8 Appliances**8.1 Installation of appliances**

Appliances shall be installed in accordance with the appliance manufacturer's instructions.

NOTE Regarding appliances fitted within the caravan, local and national requirements for the country of first destination can apply.

8.2 Restriction concerning the supply of appliances

Portable appliances producing heat and non-room-sealed space heating appliances shall not be supplied with the caravan by the caravan manufacturer.

9 Classification of thermal insulation and heating

The thermal insulation and heating levels for specific climatic conditions shall be classified as follows:

- a) Grade 1: a caravan, including windows, doors and roof lights in which the average thermal transmittance

(U) of the elements of construction shall not exceed 1,7 W/(m²·K).

There is no heating requirement for this grade.