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Leisure accommodation vehicles — Caravans — Habitation requirements

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 7422 was prepared by Technical Committee ISO/TC 177, *Caravans*.

Annex A forms an integral part of this International Standard.

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Leisure accommodation vehicles — Caravans — Habitation requirements

1 Scope

This International Standard specifies certain functional requirements for habitation aspects of caravans that conform with national and/or international regulations for road vehicles, and certain safety requirements; the clauses dealing with these latter aspects are identified by heavy type. It does not deal with leisure accommodation vehicles used for permanent residential accommodation nor with the road vehicle aspects of caravans; nor does it specify requirements for commercial trailers, trailer tents or motor caravans. It does not cover requirements relating to payloads; requirements for these will be covered at a later stage.

NOTE 1 This International Standard is one of a series for the habitation aspects of leisure accommodation vehicles.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7237:1981, *Road vehicles — Masses and dimensions of caravans — Terms and definitions.*

ISO 7418:1989, *Leisure accommodation vehicles — Vocabulary.*

ISO 7419:1991, *Leisure accommodation vehicles — Ventilation requirements.*

ISO 7420:1987, *Leisure accommodation vehicles — Oil-fired heating systems.*

ISO 7421:1991, *Leisure accommodation vehicles — Liquefied petroleum gas systems.*

ISO 8818:1988, *Leisure accommodation vehicles — Caravans — 12 V direct current extra low voltage electrical installations.*

IEC 364-7-708:1988, *Electrical installations of buildings — Part 7: Particular requirements for special installations or locations — Section 708: Electrical installations in caravan parks and caravans.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 7237 and ISO 7418 apply.

4 Construction and design

Materials used in the construction of caravans should comply with the requirements of relevant ISO standards. The structure should be rainproof both when the caravan is stationary and when it is in motion. In particular, the floor should be proof against the penetration of water thrown up from the road when the caravan is in motion and, when it is stationary, from moisture rising from the ground.

4.1 Occupancy

The occupancy of a caravan shall be designated as the number of berths provided, both basic berths and optional, additional, berths.

4.2 Rigidity

When stationary and with all corner steadies extended to the ground, an upward thrust of 1500 N applied to one corner steady shall not cause a caravan to distort to an extent that would make any door or window difficult to open.

4.3 Corner steadies

Every caravan shall be equipped with four steadies, one at each corner. These shall be retractable, adjustable in height, and each shall be capable, when extended, of carrying a load of not less than 25 % of the maximum manufacturer's total mass of the caravan. An adjusting tool shall be provided.

NOTE 2 Corner steadies, either separately or together, should not be used to raise the caravan so that one or more of its wheels are clear of the ground, unless it is stated in the User's Handbook that the steadies are designed for that purpose.

4.4 Grab handles

Four external grab handles for manoeuvring the caravan shall be fixed externally to the bodywork, one on each side at the front and rear. The hand clearance aperture shall be not less than 30 mm × 120 mm. Each grab handle when fitted shall be capable of withstanding a force of 600 N, applied to the grip at right angles to the fixing screws or attachment points, and a force of 1000 N, applied to the grip in line with the fixing screws or attachment points.

4.5 Awning attachment

4.5.1 Provision of attachment

Every caravan shall be provided with an attachment, such as an awning channel, for securing an awning.

4.5.2 Awning channel

The sizes of an awning channel shall be as shown in figure 1. The jaws shall be free from burrs which obstruct the insertion of the awning. Junctions of channels shall be aligned and shall be free from burrs.

4.6 Entrance step

If an entrance to a caravan is fitted with a step as a fixture, the step, when in position for use together with its method of fixing, shall reveal no permanent deformation after the application of a load of 2000 N on a surface of 100 mm × 150 mm, irrespective of the zone of application.

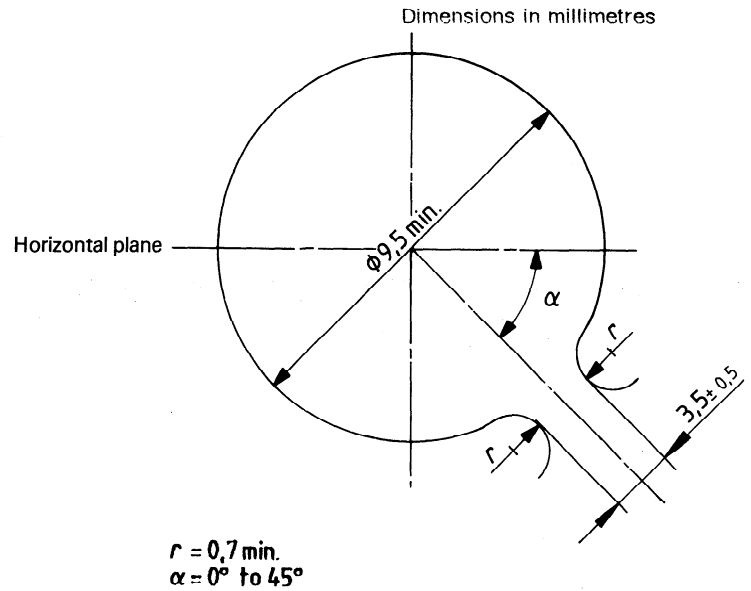


Figure 1 — Sizes of awning channel

4.7 Doors

4.7.1 Sizes

Door openings shall have a minimum clear height of 1650 mm and a minimum clear width of 500 mm, except for folding caravans for which the minimum clear height shall be 1360 mm.

4.7.2 Securing of doors

All doors, including sliding doors, both external and internal, shall be equipped with a securing or locking device capable of keeping the door closed when subjected to all forces caused by movement of the caravan. Single-leaf doors in the side of a caravan shall be hinged on the forward edge.

4.7.3 Double doors

When hinged double doors are fitted on the side of a caravan, the forward leaf shall overlap the rear leaf, which shall be fitted with a locking bolt.

4.7.4 Positioning of entrance doors

If a caravan has only one entrance door, it shall be fitted at the rear end of the caravan or on the side furthest from the centre of the highway (depending on the country of sale) when the caravan is being towed. If a caravan has more than one exterior door, then at least one door shall be fitted in one or other of those positions.

4.7.5 Childproof locks

An entrance door which is on the side nearest to the centre of the highway (depending on the country of sale) when the caravan is being towed shall be fitted with a childproof lock.

4.8 Rooflights

Rooflights and their fittings shall be such that they cannot work loose when the caravan is in motion. A mosquito net shall be provided internally.

4.9 Floor openings

Openings in a floor, for example for ventilation, shall be protected to prevent the ingress of water sprayed up from below.

5 Internal equipment (when provided)

5.1 Beds and bunks

5.1.1 Sizes

The length and width of all bed and bunk mattresses, when in position ready for use, shall be stated clearly in the manufacturer's catalogue. These sizes shall have a tolerance of ± 20 mm. Where bunks are provided without mattresses, the overall size of the length and width of the bunk shall be stated.

When the shape of the mattress is irregular, it should be illustrated, with relevant sizes indicated.

5.1.2 Vertical spacing of bunks

When the height between floor and ceiling is less than 1900 mm, no more than one bunk shall be installed above another.

5.1.3 Clearances for bunks

The minimum width of bunks between supports shall not be less than 500 mm and the minimum clear height between the top of a lower mattress and the base of an upper bunk shall be 500 mm. The checking of the clear height shall be carried out with a uniformly distributed mass of 75 kg on the mattress.

5.1.4 Upper bunks

Steps shall be provided to give access to upper bunks and a guard-rail shall be fitted along the outer side of an upper bunk for a distance of 600 mm from the head of the bunk.

5.2 Food storage

5.2.1 Capacity

Storage for foods shall be by means of a cupboard, ventilated to the external air, of a capacity of not less than 50 l, by a refrigerator of similar capacity, fitted in accordance with the manufacturer's instructions, or by a cupboard or refrigerator with a combined total capacity of not less than 50 l.

5.2.2 Space for refrigerator

When a refrigerator is not provided but space is allowed for one to be fitted, this shall be stated in the User's Handbook, together with the sizes of the space and details of any provisions made for the connection of a refrigerator to the gas and/or electricity installation.

5.3 Wardrobes

5.3.1 Design

Wardrobes shall be designed to prevent damage to clothes.

5.3.2 Capacity

Except for semi-rigid folding caravans, the horizontal dimension at right angles to the rail shall have a minimum size of 500 mm. Beneath the hanging rail, for at least 200 mm along its length, there shall be a clear height of 1100 mm. Caravans described as "all seasons" shall have a minimum size of 390 mm for the horizontal dimension along the hanging rail, plus 70 mm for each additional person over three.

5.4 Shelves and dividers

5.4.1 High-level cupboards

Storage shelves in kitchens and in high-level cupboards elsewhere, shall have a means of preventing the contents from sliding out.

5.4.2 Roof lockers

Roof lockers exceeding 1,25 m in length shall be fitted with dividers such that each compartment so formed does not exceed 1,25 m.

5.5 Tables

A table or tables shall provide at least as many places as there are berths, including optional ones. A width of 450 mm per place shall be allowed.

5.6 Cooking appliance

A cooking appliance shall have a minimum of two cooking rings.

5.7 Sink

A sink shall be fitted with a minimum size internally of 250 mm × 200 mm × 120 mm deep or, if circular in plan, with a diameter of not less than 200 mm.

6 Water supply, storage and disposal (when provided)

6.1 Couplings for fresh-water supply

6.1.1 General

Couplings shall be located at easily accessible points on the outside of a caravan and shall not protrude into the designed ground clearance space or designed angle of departure, nor add to the approved width or length of the caravan body. A sealing-off cover shall be supplied for each coupling and secured to the coupling or close to it. All pipework, fittings and seals shall be of non-toxic material.

6.1.2 Design of couplings

Couplings shall be manufactured to the sizes shown in figure 2 and figure 3, and table 1.

The material of the seals should have a hardness equivalent to 50 IRHD in accordance with ISO 4633:1983, *Rubber seals — Joint rings for water supply, drainage and sewerage pipelines — Specification for materials*, when tested in accordance with ISO 48:1979, *Vulcanized rubbers — Determination of hardness (Hardness between 30 and 85 IRHD)*.

6.1.3 Fixing of supply couplings

Supply couplings shall be fixed rigidly to a caravan. When a supply coupling is coupled to the mains, the mains pressure shall be adapted by means of a regulating device to the pressure requirements of the water appliances installed.

6.2 Fresh water

6.2.1 Fitted tanks

A fresh-water tank that is permanently fitted shall have a minimum capacity of 10 l. It shall be made of non-toxic material and shall be capable of being easily flushed and cleaned by hand.

Table 1 — Examples of pipe sizes that can be accommodated by coupling

Dimensions in millimetres

Inner diameter of pipe	Coupling diameters (see figure 2)			
	A	B	C	D
			± 0,5	± 0,15
6,3	4	6,5	7	7,55
7	5	7,5	7,75	8,5
8	6	8,5	8,75	9,5
10	8	10,5	11	12
12,5	10	13	13,5	14,5
16	12	16,5	17	18
20	15	20,5	20	21
22	18	22,5	23	24
25	21	25,5	26	27

6.2.2 Portable containers

When a portable container is provided, provision shall be made for it to be firmly secured when a caravan is in motion. Where no container is supplied, space shall be provided for the storage and securing of such a container.

6.3 Waste-water disposal tank

A holding tank for the disposal of waste water shall have a minimum capacity of 10 l. It shall be capable of being flushed and cleaned.

6.4 Waste-water drainage

6.4.1 Outlets

Outlets of waste-water pipes of showers, basins and sinks shall be so arranged that a suitable holding tank or tanks of adequate capacity can be easily placed to collect the waste water (see 6.3).

6.4.2 Couplings

Couplings for waste-water pipes shall have a minimum diameter of 19 mm.

6.5 Marking

Couplings for fresh-water supply pipes shall be clearly identified in blue and couplings for discharge pipes shall be clearly identified in grey.

Dimensions in millimetres

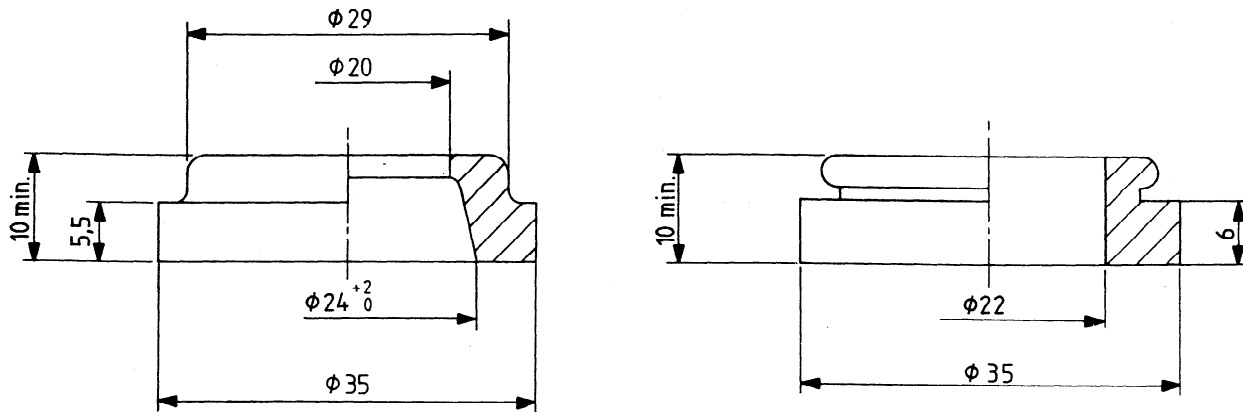


Figure 3 — Examples of flexible insert seals for water couplings

7 Space heating

7.1 Installation of appliances by manufacturer

When heating appliances are installed by the caravan manufacturer, they shall be installed in accordance with the instructions of the manufacturer of the appliances, and with ISO 7420 for oil-fired appliances and with ISO 7421 for liquefied petroleum gas (LPG) appliances. The information indicated in 7.2 shall be provided adjacent to each appliance.

7.2 Informative label

The informative label carried by a space heater shall be readily seen when the space heater is installed. If this is not possible, a duplicate label shall be located adjacent to the space heater. The label shall include the following information:

Heating
 Make of appliance:
 Type:
 Number:
 Working pressure: mbar
 Rated power: kW
 Year installed:
 This appliance can provide an average temperature difference of K

For LPG appliances, the type of gas that can be used to fuel the appliance shall also be stated.

7.3 Subsequent installation of appliances

When a heating appliance is not installed originally by the manufacturer, but when space and connections are provided, the following shall be stated in the Users' Handbook.

"In order to obtain an average temperature difference of K, installation of a heating appliance having a rated power of kW is recommended and for reasons of safety, it should be of the room-sealed type."

8 Thermal insulation

8.1 Calculation of insulation level

The method of calculation set out in annex A shall be used to calculate the heating needs for a specific climatic situation.

8.2 Thermal transmittance

The average coefficient of thermal transmittance, U , of the elements of construction of a caravan, including windows, doors and rooflights shall not exceed 1,7 W/(m²·K).

8.3 Use in winter conditions

For a caravan intended for use in winter conditions, an average temperature difference of 35 K, calculated as set out in annex A, shall be achieved by any heating installation installed or recommended. The average coefficient of thermal transmittance of the elements of construction, other than windows and rooflights, shall not exceed 1,2 W/(m²·K).

9 Services

9.1 Electricity

9.1.1 Low-voltage (LV)

Low-voltage electrical installations shall be in accordance with the requirements of IEC 364-7-708.

9.1.2 Extra-low-voltage (ELV) 12 V direct current

12 V direct current extra-low-voltage installations shall be in accordance with the requirements of ISO 8818.

9.2 Liquefied petroleum gas installations

Liquefied petroleum gas systems shall be installed in accordance with the requirements of ISO 7421.

9.3 Oil-fired installations

Oil-fired heating systems shall be installed in accordance with the requirements of ISO 7420.

10 Ventilation

Natural ventilation shall be provided in accordance with the requirements of ISO 7419.

11 Fire precautions

11.1 Means of escape

11.1.1 Emergency exits

Each separate living compartment which can be closed off from the rest of a caravan other than by a loose curtain shall be provided with an emergency exit giving direct access to the outside of the caravan in accordance with 11.1.3 or 11.1.4.

11.1.2 Toilet compartments

Toilet compartments shall be equipped with an emergency exit when evacuation necessitates transit through a zone of risk (e.g. past heating or cooking equipment) unless the compartment door is situated less than 1500 mm from a caravan entrance door.

11.1.3 Emergency doors

Emergency doors shall open outwards, and shall provide a clear opening, free from obstruction, of the sizes specified in 4.7.1. The door-lock(s), when locked from the outside, shall be capable of being immediately opened from the inside. Opening mechanisms for interior doors shall be capable of

being operated from both sides. Lever handles shall open interior doors and, preferably, entrance doors by being pushed downwards. Where an interior door is fitted with a locking mechanism, an emergency unlocking system shall be fitted on the opposite side.

11.1.4 Emergency windows and emergency panels

Emergency windows and emergency panels shall open outwards or slide horizontally and shall provide a clear opening, free from obstruction, of not less than 0,25 m², with a minimum size in any direction of 450 mm. The lower edge shall not be more than 950 mm above floor level. When such windows or panels are hinged at the top, they shall be capable of opening through at least 70° and shall stay fully open until closed manually. Means of escape shall not be provided by windows pivoted horizontally other than along the top edge.

11.1.5 Work surfaces

Any work surface which opens towards an external doorway shall not obstruct it, leaving a clear opening as in 11.1.3.

11.1.6 Heating and cooking equipment

Equipment for heating or cooking shall not be mounted on doors, nor installed in front of emergency exits.

11.2 Protection of adjacent surfaces

Protection of surfaces adjacent to heat-generating appliances shall be achieved by ensuring that all such appliances are certified by an approved body as complying with appropriate national, regional or international standards with regard to safety and relevant installation requirements. Such appliances shall only be installed in accordance with the manufacturer's instructions.

11.3 Fire extinguisher

If a fire extinguisher is provided (see 12.2), it should be at least a 1 kg powder extinguisher: a future International Standard will specify requirements.

12 Warning notice

12.1 Provision of warning notice

A permanent notice, not less than 200 mm by 130 mm, giving simple fire prevention advice and setting out the action to be taken in the event of fire shall be fixed inside a caravan in a position where it can be easily and readily seen. The height of the lettering for the headings, which shall be printed in