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Tovorna kolesa - 6. del: Prevoz potnikov

Carrier Cycles - Part 6: Passenger transport

Lastenfahrräder - Teil 6: Personentransport

Cycles utilitaires - Partie 6 : Transport de passagers

Ta slovenski standard je istoveten z: **prEN 17860-6**

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43.150 Kolesa Cycles

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Carrier Cycles - Part 6: Passenger transport

Cycles utilitaires ¿- Partie 6 : Transport de passagers

Lastenfahrräder - Teil 6: Personentransport

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 17860-6:2024) has been prepared by Technical Committee CEN/TC 333 “Cycles”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

This document is part of standard series consisting of the following parts:

- prEN 17860-1:2022, *Carrier Cycles — Part 1: Terms and definitions*
- prEN 17860-2:2022, *Carrier Cycles — Part 2: Lightweight single track carrier cycles — Mechanical aspects*
- prEN 17860-3:2022, *Carrier Cycles — Part 3: Lightweight multi track carrier cycles — Mechanical aspects*
- prEN 17860-4, *Carrier Cycles — Part 4: Heavy weight carrier cycles — Mechanical and functional aspects*
- prEN 17860-5:2023, *Carrier Cycles — Part 5: Electrical aspects*
- prEN 17860-6:2023, *Carrier Cycles — Part 6: Passenger transport*
- prEN 17860-7:2023, *Carrier Cycles — Part 7: Cargo trailers*

Introduction

This document gives requirements and test methods for transportation of passengers on a carrier cycle.

Because of the diversity of geometries and solutions of carrier cycles not all requirements and test methods in this document may apply to every carrier cycle.

Experts in the field of passive safety and ergonomics, especially regarding children, are invited to join the standardization process and provide input for future improvements of this standard.

1 Scope

This document applies to the transportation of passengers in a forward- or rearward-facing position on a carrier cycle as defined in the other parts of this standard series.

This document does not apply to the transportation of children in a child seat that is tested according to EN 14344:2022.

This document applies to the intended riding purpose commuting and leisure with moderate effort, see EN 17406:2020+A1:2021.

NOTE Some European countries have special legislation for transporting children on cycles. Compliance with this document might not meet this legislation.

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 71-2:2020, *Safety of toys - Part 2: Flammability*

EN 71-3:2019+A1:2021, *Safety of toys - Part 3: Migration of certain elements*

EN 614-1:2006+A1:2009, *Safety of machinery - Ergonomic design principles - Part 1: Terminology and general principles*

EN 14344:2022, *Child care articles - Child seats for cycles - Safety requirements and test methods*

prEN 17860-1:2022, *Carrier cycles - Part 1: Terms and definitions*

prEN 17860-2:2022, *Carrier Cycles - Part 2: Lightweight single track carrier cycles – Mechanical aspects*

prEN 17860-3:2022, *Carrier Cycles - Part 3: Lightweight multi track carrier cycles – Mechanical aspects*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 17860-1:2022 and the following 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/

3.1
access zone
zone which it is anticipated that a transported passenger can reach with his/her hands or feet

3.2
belt adjusting device
device enabling the belt to be adjusted according to the requirements of the individual wearer and to the position of the seat

Note 1 to entry: The adjusting device may be part of the buckle, or a retractor, or any other part of the belt.

3.3
buckle
quick-release device enabling the wearer to be held by the belt

Note 1 to entry: The buckle may incorporate the adjusting device, except in the case of a harness belt buckle.

3.4
infant carrier
restraint system intended to accommodate the child in a rearward-facing semi-recumbent position

3.5
ISOFIX
system that provides a method of connecting an infant carrier to a vehicle

Note 1 to entry: It is based on two vehicle anchorages and two corresponding attachments on the infant carrier in conjunction with a means to limit the pitch rotation of the infant carrier

3.6
passenger
person who is seated on the carrier cycle but does not actively participate in the propulsion of the vehicle

3.7
protected volume
volume accessible by the passenger, when sitting and restrained in the seat, where specific safety requirements are necessary

3.8
restraint system
system for a specific vehicle type or a type defined by the vehicle manufacturer consisting of a seat and a belt assembly fixed to the vehicle by appropriate means and consisting additionally of all elements which are provided to diminish the risk of injury to the wearer, in the event of an abrupt vehicle deceleration, by limiting the mobility of the wearer's body

3.9
safety-belt
seat-belt
belt
belt assembly
arrangement of straps with a securing buckle, adjusting devices and attachments which is capable of being anchored to the structure of a carrier cycle and is designed to diminish the risk of injury to its wearer, in the event of collision or of abrupt deceleration of the cycle, by limiting the mobility of the wearer's body

Note 1 to entry: Such an arrangement is generally referred to as a 'belt assembly', which also embraces any device for absorbing energy or for retracting the belt.

3.10
seat
device for the rider and passenger to sit on that is not designed in accordance with the principle of a cycle saddle

4 Classification

This standard divides passengers in classes based on weight criteria according to Table 1.

Table 1 — Classification

Class	Weight range	Typical max. height	Typical age
1a	3 – 9 kg	NA	3 - 12 months
1b	9 – 22 kg	1 100 mm	1 - 5 years [a]
1c	22 – 36 kg	1 400 mm	5 - 8 years
2	36 – 120 kg	NA	8 years and up

[a] The child shall be able to sit upright without support.

Children from 3 - 9 kg (Class 1a) and children in Class 1b who are unable to sit upright without support are transported in a rearward-facing position infant carrier that should meet the UN ECE R44/04 or UN ECE R129/03 regulations.

5 General requirements for testing

5.1 Numbers and condition of specimens for the strength tests

In general, for static, impact and fatigue tests, each test shall be conducted on a new test sample, but if only one sample is available, it is permissible to conduct all of these tests on the same sample with the sequence of testing being fatigue, static and impact. When more than one test is conducted on the same sample, the test sequence shall be clearly recorded in the test report or record of testing.

NOTE It will be noted that if more than one test is conducted on the same sample, earlier tests can influence the results of subsequent tests. Also, if a sample fails when it has been subjected to more than one test, a direct comparison with single testing is not possible.

In all strength tests, specimens shall be in the fully-finished condition.

5.2 Accuracy tolerances of test conditions for brake tests and strength tests

Unless stated otherwise, accuracy tolerances based on the nominal values shall be as follows:

1) Forces and torques 0/+5 %

2) Masses and weights ± 1 %

3) Dimensions ± 1 mm

4) Angles ± 1°

5) Time duration ± 5 s

6) Temperatures ± 2 °C

7) Pressures ± 5 %

5.3 Fatigue test

The force for fatigue tests shall be applied and released progressively, not to exceed 10 Hz. The tightness of fasteners according to manufacturer's recommended torque can be re-checked not later than 1 000 test cycles to allow for the initial settling of the component assembly. (This is considered applicable to all components, where fasteners are present for clamping.) The test bench shall be qualified to meet dynamic requirements of 5.2.

5.4 Fatigue test for composite components

For fatigue test for composite components, the initial value of displacement (peak-to-peak value) is taken after 1 000 cycles and before 2 000 cycles.

5.5 Plastic material test ambient temperature

All strength tests involving any plastic materials shall be pre-conditioned for two hours and tested at an ambient temperature of 23 °C ± 5 °C.

5.6 Crack detection methods

Standardized methods should be used to emphasize the presence of cracks where visible cracks are specified as criteria of failure in tests specified in this standard.

NOTE For example, suitable dye-penetrant methods are specified in EN ISO 3452-1, EN ISO 3452-2 EN ISO 3452-3 and EN ISO 3452-4. In addition, white paint or surface treatment can be used to aid in detection for composite materials.

6 General requirements for seats

6.1 General

The following requirements and corresponding test methods apply to the transportation of passively transported passengers (i.e. not pedalling).

6.2 Number of passengers

The number of passengers is not limited but defined by the maximum gross vehicle weight as given in prEN 17860 parts 2, 3 and 4.

All tests shall be performed under maximum load.

The user manual shall have load scenarios to clarify how many passengers of which category in which seating position may be transported.

The user manual shall notify that country specific (traffic) regulation can dictate limitations to the number and age of passengers.

6.3 Seating

6.3.1 General requirements

For passenger transportation, a suitable seat shall be available for each person to be transported in a forward- or rearward-facing position.

The requirements and tests apply to all seats for transporting passengers.

For the seating tests the weights of the passengers to be transported as specified by the manufacturer shall be used.

The seat shall be equipped with footrests. The floor of a transportation container equipped with a seat is regarded as a footrest. The footrest shall prevent the risk of entrapment (e.g. the risk of a foot getting stuck underneath the carrier cycle).

For Class 1a a suitable connector (Clause 11) shall be fitted for installation of an infant carrier in rearward-facing position. The requirements of 6.3 Seating are not applicable to the infant carrier or the connector. All infant carriers that meet UN ECE R44/04 or UN ECE 129/03 can be used for transporting a Class 1a child. The manufacturer shall publish which models and brands of infant carrier(s) can be used with the connectors.

6.3.2 Test method for dynamic loads

Seats shall meet the requirements in accordance with Table 2. No crack in the seat surface and no visible crack or fracture of another part shall occur in this case.

The test is conducted at all designed seating positions. If a seat is part of a combined construction of two or more seats, for example a bench, then all seats shall be tested simultaneously.

The loading pad for the seat surface (see Figure 1) is applied centrally on the seat surface. The test load is applied vertically downwards.

The defined force, F_1, is applied by the loading pad for the seat surface(s) as defined in Table 2.

The loads are applied for a corresponding number of cycles as defined in Table 2.

Table 2 — Values for the dynamic seat test

Tests	Forces	Cycles
Fatigue life test on seat(s) surface(s) (*Fz*)	permissible maximum specified load in kg × 9,81 m/s²	25 000

6.3.3 Test method for static loads

Seats shall meet the requirements in accordance with Table 3. No crack in the seat surface and no visible crack or fracture of another part shall occur in this case.

All adjustable backrests shall be moved to the most upright position.

The test is conducted at all designed seating positions. If a seat is part of a combined construction of two or more seats, for example a bench, then these seats shall be tested simultaneously.

The loading pad for the seat surface is positioned centrally on the seat surface(s). The force according to Table 3 shall be applied vertically.

The loading pad for the backrest is applied either centrally onto the backrest or 100 mm beneath the top edge of the backrest depending on which point is lower (see Figure 2). The force according to Table 3 shall be applied horizontally.

The size of the loading pad for the backrest test may be altered when the manufacturer deems it more suitable.

Table 3 — Values for the static seat tests

Tests	Time	Forces
Static or impact test on seat surface (*Fz*)	10 *s* (±2 *s*) + 1 × 30 min (±10 *s*)	1,6 times the permissible maximum specified load in kg × 9,81 m/s²
Static or impact test on backrest (forward-facing position) (*Fx*)	10 *s* (±2 *s*) + 1 × 30 min (±10 s)	0,5 times the permissible maximum specified load in kg × 9,81 m/s²
Static or impact test on backrest (rearward-facing position) (*Fx*)	10 *s* (±2 *s*) + 1 × 30 min (±10 s)	10 times the permissible maximum specified load in kg × 9,81 m/s²