



Designation: F3642 – 23

Standard Specification for Front-Mounted Bicycle Child Carriers (9 kg – 15 kg)¹

This standard is issued under the fixed designation F3642; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers child carriers that position the child ahead of the rider and behind the handlebar of a bicycle. These child carriers transport children with a minimum weight of 9 kg and a maximum weight of 15 kg who are capable of sitting unaided.

1.2 This specification does not apply to child carriers mounted in the following configurations: above or forward of the handlebar, above or forward of the front wheel, forward of the handlebar and behind the front wheel, behind the saddle of the bicycle, and above or behind the rear wheel.

1.3 *Units*—The values stated in SI units are to be regarded as the standard. No other units of measurement are included in this standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

B117 Practice for Operating Salt Spray (Fog) Apparatus
F833 Consumer Safety Performance Specification for Carriages and Strollers

2.2 ANSI Standards:

ANSI Z535.6-2011(R2017) Safety Information in Product Manuals, Instructions, and Other Collateral Material

¹ This test method is under the jurisdiction of ASTM Committee F08 on Sports Equipment, Playing Surfaces, and Facilities and is the direct responsibility of Subcommittee F08.10 on Bicycles.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

2.3 EN Standards:

EN 14344:2022 Child use and care article—Child seats for cycles—Safety requirements and test methods

2.4 Federal Standards:

16 CFR 1500.44 Flammability – Method for determining extremely flammable and flammable solids

16 CFR 1500.48 Sharp Points – Technical requirements for determining a sharp point in toys and other articles intended for use by children under 8 years of age

16 CFR 1500.49 Sharp Edges – Technical requirements for determining a sharp metal or glass edge in toys and other articles intended for use by children under 8 years of age

3. Terminology

3.1 Definitions:

3.1.1 *additional guard, n*—guard that is always provided with the seat but does not satisfy the definition of an integral guard.

3.1.2 *armrest, n*—structure to support the child's arms, may be an extension of the sides of the seat surface or separate attachment pieces.

3.1.3 *backrest, n*—structure to support the child's back while in a seated position.

3.1.4 *child carrier, n*—seating device, including all equipment and attached hardware that mounts to a bicycle, with a shape that is adapted to the seated position of a child and keeps the child in a comfortable position during a ride.

3.1.5 *footrest, n*—structure to support the child's feet.

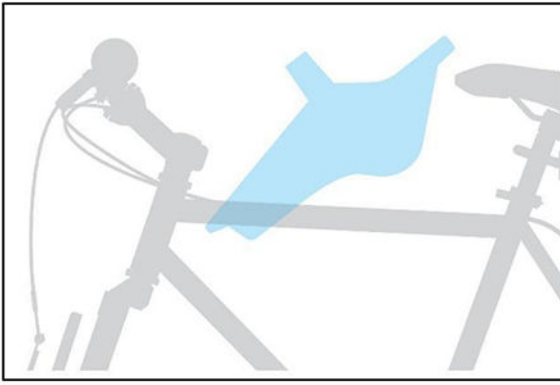
3.1.6 *foot retention system, n*—foot strap or other mechanism that retains or secures the child's feet onto the footrest while riding.

3.1.7 *front-mounted child carrier, n*—child carrier that positions the child between the saddle and the handlebar (Fig. 1).

3.1.8 *handlebar, n*—steering bar that is held by the rider.

3.1.9 *handrest, n*—structure to provide a location for the child's hands so they are not dependent on any part of the bicycle or its components for stability; may be part of the armrest structure.

3.1.10 *integral guard, n*—guard that is formed as part of the main unit.



NOTE 1—This test fixture is an example only and may be sufficient for some but not all of the testing outlined in the above document.

FIG. 1 Front-Mounted Child Carrier Attached to the Bicycle Frame, Handlebar, or Stem between the Rider Saddle and Handlebars of the Bicycle.

3.1.11 *normal use, n*—applications described as intended use for the product found within the manufacturer's instructions.

3.1.12 *protective device, n*—guard or accessory used to prevent contact with a hazard or hazardous element.

3.1.13 *restraint system, n*—device or devices designed to keep the child in an upright and seated position in the child carrier, as well as prevent the child from sliding forward such as a three-point harness.

3.1.14 *rider, n*—person who controls the bicycle to which the child carrier is attached and who is responsible for the safety of the child passenger.

3.1.15 *seat, n*—part of the child carrier within which the child sits.

3.1.16 *shoulder retention system, n*—device or devices designed to capture the child's shoulder and upper body, keeping the child in an upright and seated position in the child carrier, as well as preventing the child from sliding forward away from the backrest, such as a three point harness.

4. Requirements

4.1 General:

4.1.1 Child carriers shall be designed and manufactured in such a way that components with which the child or rider come into contact do not cause injuries during normal use or when used in accordance with the manufacturer's instructions. Surfaces shall be free from burrs, sharp edges, and points; if such are present, they shall be covered by protective coverings.

4.1.2 The child carrier shall have an instruction manual included with the packaged unit.

4.1.3 The child carrier shall have instructions to inform the user of the necessary adjustments to achieve the correct fit onto a bicycle.

4.1.4 Child carriers and the materials used therein shall comply with all applicable portions of the Consumer Product Safety Improvement Act of 2008.

4.1.5 The child shall be independently supported and not be dependent on the bicycle or its parts for stability when using the child carrier.

4.1.6 No openings that the child's hands can reach shall have dimensions larger than 6 mm nor smaller than 13 mm.

4.1.7 The child carrier shall prevent contact of hands and feet with rotational parts of the bicycle that could cause injury. This contact shall be prevented by design or with the addition of protective devices.

4.1.8 The manufacturer shall warn the rider that a load added to the bicycle will lessen the stability, braking performance and alter the riding characteristics of the bicycle.

4.2 Mounting:

4.2.1 When assembled in accordance with the manufacturer's instructions, the child carrier components shall be firmly attached to the bicycle.

4.2.2 If the means of attachment of the child carrier to the bicycle is within easy reach of the child and could be loosened by the child, then there shall be a secondary device to restrict movement of the child carrier either by providing an additional and independent attachment, or ensuring that loosening the primary attachment will not fully release the connection.

4.2.3 Mounting hardware shall attach directly to the bicycle and may be attached to, but not limited to, the top tube, the stem, or a combination of the seat post, seat tube, and top or down tube.

4.2.4 There shall be at least one attachment point to the bicycle.

4.2.5 The child carrier shall not attach to the handlebar or the portion of the stem that extends beyond the steering axis.

4.2.6 The child carrier and its mounting hardware shall be securely fastened in such a way as to prevent any rearward, rotational, or lateral movement of the child carrier or mounting hardware.

4.2.7 The mounting hardware shall not interfere with the function or safe operation of the bicycle or compromise the structural integrity.

4.2.8 The placement of the child carrier, and the child within the child carrier, shall not allow the child to interfere with the control of the bicycle in any way.

4.3 *Materials*—Plastics or other synthetic materials, if used, shall be stabilized against ultraviolet (UV) radiation and resistant to ozone.

4.4 *Equipment*—The child carrier shall be equipped with the following features:

4.4.1 A foot retention system that retains the child's feet on the foot rest. Unless enclosed, foot retention straps shall be provided. Foot retention straps shall be at least 20 mm wide and adjustable and shall meet the requirements outlined within this document

4.4.2 A backrest that meets the requirement outlined in the document.

4.4.3 Armrests or handrests or both.

4.4.4 Protective devices or design elements that prevent contact of hands and feet with any moving or movable parts of the bicycle that could cause injury.

4.5 Restraint System:

4.5.1 The retention system requires a minimum of a three-point harness system that is inclusive of a shoulder retention

system to keep the child in an upright and seated position in the child carrier, as well as prevent the child from sliding forward.

4.5.2 Buckles, if used, shall comply with the buckle release requirements in Consumer Safety Performance Specification F833.

4.5.3 Belts or webbing, if used, shall be at least 20 mm wide.

4.6 Dimensions:

4.6.1 Interior dimensions of the seating area shall be adequate for the size of a seated child at the 95th percentile of the weight limitation.

4.6.2 The backrest shall have a minimum height of 160 mm as defined in EN14344:2022.

4.6.3 If used, armrests shall have sufficient height to keep the child stable in lateral directions.

5. Testing Requirements

5.1 Test Criteria:

5.1.1 After testing in accordance with the sections outlined within this specification, the child carrier shall show no visible signs of fracture nor any deformation or displacement that would impair the safety and function of the child carrier or the bicycle as defined by the allowable amounts set out within this specification.

5.1.2 The tests in 5.3 – 5.5 shall be carried out on the same sample and in the order that they appear in this document. Separate samples may be used for all other tests.

5.2 Tolerances and Test Conditions—Unless otherwise stated, the tolerances outlined in the section below shall be used.

5.2.1 All forces shall have an accuracy of $\pm 5\%$. All masses shall have an accuracy of $\pm 1\%$.

5.2.2 All dimensions shall have an accuracy of ± 1.0 mm.

5.2.3 All time measurements shall have an accuracy of ± 1 s.

5.2.4 All angles shall have an accuracy of $\pm 1^\circ$.

5.2.5 All frequencies and amplitudes shall have an accuracy of $\pm 5\%$.

5.2.6 All tests shall be carried out at a temperature of $23 \pm 5^\circ\text{C}$ and after the child carrier has been conditioned at $23 \pm 5^\circ\text{C}$ for at least 2 h unless otherwise specified.

5.3 General Testing:

5.3.1 All components of the child carrier shall meet the flammability requirements defined in 16 CFR 1500.44.

5.3.2 All components of the child carrier shall meet the requirements of 16 CFR 1500.48 regarding sharp points that could cause puncture or laceration injuries.

5.3.3 All components of the child carrier shall satisfy the requirements of 16 CFR 1500.49 regarding sharp edges.

5.4 Environmental Salinity Tests:

5.4.1 The child carrier shall be tested in accordance with the salt spray test defined in Practice B117 for a period of 96 h.

5.4.2 Tested components shall show no visible evidence of corrosion or deterioration that could jeopardize structural integrity of the assembly.

5.4.3 The tested unit shall continue to operate in accordance with the manufacturer's written instructions.

5.5 Environmental Temperature Tests:

5.5.1 Low-Temperature Resistance:

5.5.1.1 Store the child carrier for at least 4 h, but not more than 24 h, at a temperature of $-7 \pm 3^\circ\text{C}$.

5.5.1.2 Examine the child carrier for damage or distortion that could affect the safety or function of the child carrier.

5.5.1.3 Damage or distortion that could affect the safety or function of the child carrier constitutes failure of the test.

5.5.2 Resistance to High Temperatures:

5.5.2.1 Store the child carrier for at least 4 h, but not more than 24 h, at a temperature of $50 \pm 3^\circ\text{C}$.

5.5.2.2 Examine the child carrier for damage or distortion that could affect the safety or function of the child carrier.

5.5.2.3 Damage or distortion that could affect the safety or function of the child carrier constitutes failure of the test.

5.6 Impact Testing:

5.6.1 Ambient Drop Test:

5.6.1.1 Place the child carrier in ambient conditions for a period of at least 4 h.

5.6.1.2 Mount the child carrier on the test fixture that holds the lowest point of the underside of the seating area of the child carrier shell at a height of 1.00 ± 0.01 m above a concrete floor. The bottom of the fixture has a pivoting device that allows the fixture to rotate until contact with the floor occurs.. The mass of the drop arm of the fixture is $11 + 0.5/-0$ kg. Release the child carrier under gravity from rest, rotating on the fixture until the upper back of the child carrier strikes the floor.

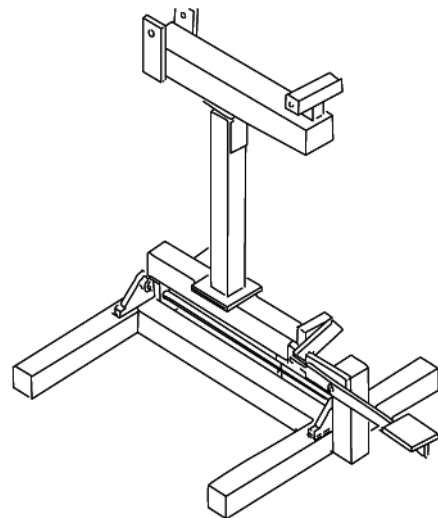
5.6.1.3 Examine the child carrier for damage or distortion that could affect the safety or function of the child carrier.

5.6.1.4 Damage or distortion that could affect the safety or function of the child carrier constitutes failure.

5.6.2 Low-Temperature Drop Test:

5.6.2.1 Store the child carrier for at least 4 h, but not more than 24 h, at a temperature of $-7 \pm 3^\circ\text{C}$.

5.6.2.2 Remove the child carrier from the cold environment and mount it on the test fixture depicted in Fig. 2, which holds



NOTE 1—This test fixture is an example only and may be sufficient for some but not all of the testing outlined in the above document.

FIG. 2 Child Carrier Drop Test Fixture