



Standard Safety Specification for Stationary Upright and Recumbent Exercise Bicycles and Upper Body Ergometers¹

This standard is issued under the fixed designation F1250; 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.

INTRODUCTION

The goal of this specification is to promote proper design and manufacturing practices for stationary upright and recumbent exercise bicycles and upper body ergometers. Through these specifications, this specification aims to assist designers and manufactures in reducing the possibility of injury when these products are used in accordance with the operational instructions.

The equipment user must recognize, however, that a standard alone will not necessarily prevent injuries. Like other physical activities, exercise involving stationary upright and recumbent exercise bicycles and upper body ergometers involves the risk of injury, particularly if the equipment is used improperly or not properly maintained. In addition, users with physical limitations should seek medical advice and instruction from the fitness facility prior to using this equipment. Certain physical conditions or limitations may preclude some persons from using this equipment properly and without increasing the risk of serious injury.

1. Scope

1.1 This safety specification covers the safety design features standard establishes parameters for the design and manufacture of stationary exercise bicycles. The device shall be assembled bicycle equipment as defined in 3.2.16 accordance with the manufacturer's instructions for safe use.

1.2 It is the intent of this standard to specify fitness products for use only by an individual age 13 and older.

1.3 This standard is limited to exercise bicycles of to be used in conjunction with Specification F2276 and Test Methods F3023.

1.2.1 Class A—Non-free-wheeling exercise bicycles with a directly driven flywheel.

1.2.2 Class B—Free-wheeling exercise bicycles.

1.2.3 Class C—Ergometer bicycles, or, those bicycles used to precisely measure work.

1.2.4 Class D—Units designed to convert road bicycles to stationary exercise bicycles.

1.4 This specification is intended to reduce the demonstrated hazards associated with the use of stationary exercise bicycles.

1.5 This specification is written to provide reasonable safety standards for the user of stationary exercise bicycles during storage, movement, entry, use, and exit from the product.

1.6 This standard does not apply to mechanisms that convert road bikes to indoor stationary cycles.

1.7 The values stated in SI units are to be regarded as standard. The values in parentheses are for information only.

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

2. Referenced Documents

2.1 ASTM Standards:²

F1749 Specification for Fitness Equipment and Fitness Facility Safety Signage and Labels

¹ This safety specification is under the jurisdiction of ASTM Committee F08 on Sports Equipment, Playing Surfaces, and Facilities and is the direct responsibility of Subcommittee F08.30 on Fitness Products.

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

[F2276 Specification for Fitness Equipment](#)

[F2571 Test Methods for Evaluating Design and Performance Characteristics of Fitness Equipment](#)

[F3023 Test Methods for Evaluating Design and Performance Characteristics of Stationary Upright and Recumbent Exercise Bicycles and Upper Body Ergometers](#)

3. Terminology

3.1 The terms listed below are unique to this specification. For terms not defined below, refer to Specification [F2276](#).

3.2 Definitions:

3.2.1 *back support, n*—the part of the user support means that comes in contact with the users back during operation.

3.2.2 *consumer exercise bicycle, n*—stationary exercise bicycle intended for use by one person or family unit in a home environment.

3.2.3 *cycle, n*—movement of a point or load from a starting position and back to the same starting position. The cycle being executed through the full range of intended motion.

3.2.4 *direct drive exercise bicycle, n*—stationary exercise bicycles wherein the flywheel is directly coupled to the pedals without the use of a freewheel mechanism. These exercise bicycles are often used in a “class” or group institutional setting.

3.2.5 *ergometer, n*—(1) a stationary exercise bicycle-like device where the user is positioned in an upright seated position and engages the crank mechanism by hand, or (2) upper body cardio vascular exercise units that may or may not be equipped with an apparatus for measuring the work performed by exercising.

3.2.5.1 *Discussion*—

The pedals are replaced by handles as shown in [Fig. 1](#). The unit may have a back support, similar to a recumbent bike, that supports the user’s back.

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FIG. 13 Illustration of Bicycle Terms Upright Bike



FIG. 1 Upper Body Ergometer

3.2.6 *flywheel, n*—a heavy wheel for opposing and moderating, by its inertia, fluctuations of speed in the exercise bicycle on which it revolves is mounted.

3.2.7 *freewheel, n*—a device that allows the driver bicycle wheel to run on, free from the drive sprocket when motion of the pedals is stopped; mechanism that is designed to disengage the flywheel from the pedal mechanism in one direction.

3.2.8 *handlebar, n*—the means that are provided to a user to enhance balance and stability by partially or substantially supporting the user’s weight with the user’s arms.

3.2.9 *handlebar stem, n*—connection between the handlebar and frame provided to adjust the height of the handlebar.

3.2.10 *institutional exercise bicycle, n*—stationary exercise bicycle intended for use by numerous persons in a commercial or institutional, as opposed to a home, consumer or residential, environment.

3.2.11 *pedal, n*—a device designed to support the foot while the user is performing the exercise as intended by the manufacturer, or while the user mounts or dismounts the equipment.

3.2.12 *stationary recumbent exercise bicycle, n*—a “bicycle-like” fixed device, on which performance is achieved by means of a pedaling motion applied by the user. Depending on the class, the pedaling motion can be braked, whereby the load is modified; stationary exercise bicycle where the user is positioned in a seated position with their back supported against a back support.

3.2.13 *seat post tube, n*—member or component used to adjust the height of the seat.

3.2.14 *seat sleeve tube, n*—the part of the frame where the seat post is inserted.

3.2.15 *seat support, n*—the part of the seat post where the seat pad is secured or mounted.

3.2.16 *stationary exercise bicycle, n*—stationary training equipment that positions a user’s upper or lower body in an upright or recumbent position to turn a directly coupled or connected flywheel or freewheel crank mechanism with the user’s feet.

4. General Requirements

4.1 Stability:

4.1.1 The bicycle shall be stable in a statically loaded condition and shall not tip forward, backward or sideward.

4.1.2 The bicycle base of support shall not tilt when force is applied.

4.1.3 The bicycle structure to which the horizontal force is applied shall not break or be permanently deformed.

4.1.4 The tests for stability shall be conducted in accordance with 7.1.

4.2 Exterior Design:

4.2.1 All edges of parts accessible to the user or to bystanders shall be burr-free, rounded, or otherwise guarded.

4.2.2 The design of rotating and moving parts which are accessible to the user shall avoid shear, pinch, or catch points.

- 4.2.3 Spokes must not be accessible.
- 4.2.4 Dangerous points of drive train components shall be guarded.
- 4.2.5 Adjustment devices such as knobs and pins and frame components, and so forth, (for example, handlebars) shall not be within the range of normal leg movements.
- 4.2.6 The tests for the safety of exterior design shall be conducted in accordance with 7.2.

4. Equipment Types

4.1 This specification covers the design and manufacture of stationary exercise bicycles as defined in 3.2.16 and illustrated in Figs. 2-4, as well as the design and manufacture of upper body ergometers as defined by 3.2.5 and illustrated in Fig. 1.

5. Performance-Design and Construction Requirements

5.1 Overheating:

5.1.1 No accessible metallic part shall have a temperature of more than 140°F (60°C). No accessible nonmetallic part shall have a temperature greater than 185°F (85°C).

5.1.2 The test for overheating shall be conducted in accordance with 7.3.

~~5.2 Frame and Seat Post Retention Assembly—The test for frame and seat post clamp assembly shall be conducted in accordance with 7.4.~~

5.1 Seat Post and Seat: Seat Post:

5.1.1 Insertion Depth—The seat shall be adjustable as prescribed by the manufacturer’s specifications; post tube shall have a permanent line indicating the minimum insertion depth of at least 1.5 times the largest cross section dimension (for example, diameter or longest dimension of the inserted seat tube) into the seat sleeve tube. A mark is not required if the minimum insertion depth is provided by the design.

5.3.1.1 The seat post shall have a permanent visual mark indicating a maximum extension. At maximum extension, no less than 2.0 in. (5.1 cm) of the seat post shall be engaged in the support structure. No mark is required if the minimum insertion depth is already provided by the design. The seat shall be mounted onto the post with a steel seat pan, shouldered seat post, capped seat bracket, or any other device that protects the user from impalement in case of failure of the seat or seat post.

5.1.2 The seat shall be adjustable as prescribed by the manufacturer’s specifications. The seat post tube shall be retained by a clamp, pin, or similar means.

5.1.3 The seat shall be mounted onto the seat post tube with a seat support. A seat support structure shall be provided that protects the user from impalement in case of failure of the seat or seat post.

5.1.4 When properly adjusted for use according to the manufacturer’s specifications, the manufacturer’s specifications, and tested in accordance with the test method, the seat shall not tilt-pivot in an upward, downward or side to side direction on its seat post tube connection means through an angle greater than 2o when a load of 680 N ± 2 % (152 lb ± 2 %) is applied.

5.1.5 The test for seats shall be conducted in accordance with seat and seat post shall meet the loading requirements of 7.5 Specification F2276.

5.2 Seat Back Support—The seat back support shall withstand a load applied to it in accordance with the test method and as defined below, without breakage. For consumer exercise bicycles this load shall be 1.0 times the maximum user weight (as defined by the manufacturer) or 136 kg (300 lb) whichever is greater. For institutional exercise bicycles, a load of 1.5 times the maximum user weight (as defined by the manufacturer) or 150 kg (330 lb) whichever is greater.

5.3 Handlebars:

5.3.1 Insertion Depth—If a vertical shaft adjustment is used, a visual permanent mark of 2.5 in. (6.35 cm) above the end of the handlebar support shall indicate the adjustment tube shall have a permanent line indicating the minimum insertion depth. No mark is depth of at least 63.5 mm (2.50 in.). A mark is not required if the minimum insertion depth is already provided by the design.



FIG. 24 Illustration of Bicycle Terms Direct Drive Exercise Bicycle