Designation: F2115 – 12

An American National Standard

Standard Specification for Motorized Treadmills[1]

This standard is issued under the fixed designation F2115; 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 mechanical design and manufacturing practices for motorized treadmills. Through these practices, this specification aims to assist designers and manufacturers in producing functional, safe machines under proper operational conditions. The equipment user must recognize, however, that a standard alone will not necessarily prevent injuries. Like other physical activities, exercise involving treadmills involves the risk of injury, particularly if the equipment is used improperly. The designers and manufacturers of treadmills should also consider other standards including, but not limited to, those listed below. This specification does not apply to treadmills designed for underwater use.

1. Scope

1.1 This specification covers the establishment of parameters for the design and manufacture of motorized treadmills.

1.2 It is intent of this specification to specify products for use by individuals age 13 and above.

1.3 This standard is to be used in conjunction with Specification F2276, Test Methods F2571, and Test Methods F2106.

1.4 This standard takes precedence over Specification F2276 and Test Methods F2571 in areas that are specific to motorized treadmills.

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

1.6 *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 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

F2106 Test Methods for Evaluating Design and Performance Characteristics of Motorized Treadmills

F2276 Specification for Fitness Equipment

F2571 Test Methods for Evaluating Design and Performance Characteristics of Fitness Equipment

2.2 *UL Standards:*[3]

UL 1647 Motor Operated Massage and Exercise Machines

3. Terminology

3.1 The terms listed below are unique to this specification. For terms not defined below, refer to Specification F2276.

3.2 For treadmill terminology, see Fig. 1.

3.3 *Definitions:*

3.3.1 *adjustable incline system, n*—components that allow the user to vary the angle of the moving surface relative to the floor.

3.3.2 *catch point, n*—location at which edges, protrusions, or surfaces allow a body part to become injured or clothing to be damaged.

3.3.3 *control panel, n*—machine/user interface device for controlling the operation of or displaying information about the operational state of the treadmill.

3.3.4 *cycle, n*—refers to one application of load to specifications required in the standard followed by removal of that load.

3.3.5 *deck, n*—component that supports the moving surface.

[1] This 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.

[3] Available from Underwriters Laboratories (UL), Corporate Progress, 333 Pfingsten Rd., Northbrook, IL 60062.

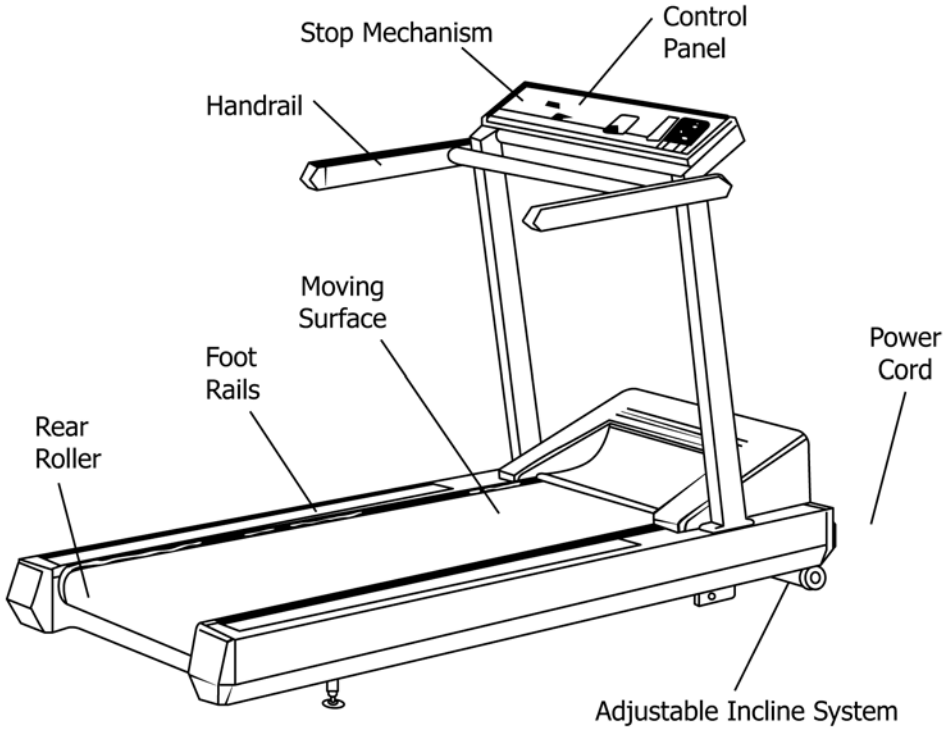

FIG. 1 Treadmill Terminology

3.3.6 *folding treadmill, n*—treadmill that is designed with some components that can be moved to allow a more compact, nonusable storage position.

3.3.7 *foot rail, n*—area beside the moving surface intended for the user to stand on when mounting or dismounting or during a pause.

3.3.8 *handrail, n*—the means that are provided for a user to enhance balance and stability by partially or totally supporting the user's weight with the user's arms.

3.3.9 *motorized drive, n*—system that causes motion in the moving surface—utilizing a power source other than the user.

3.3.10 *moving surface, n*—component(s) on which the user walks or runs.

3.3.11 *roller, n*—cylindrical component of the treadmill used to tension or support the moving surface.

3.3.12 *steady state unloaded condition, n*—operational state of the treadmill in which no user or other externally applied load has been applied to the treadmill and the moving surface speed has been allowed to stabilize as commanded by the user interface.

3.3.13 *stop mechanism, n*—device on the treadmill that, when actuated, removes power from the system that drives the moving surface or initiates a controlled stop.

3.3.14 *treadmill, n*—motorized stationary exercise device that allows the user to walk, jog, or run by means of traversing a continuous moving surface.

3.3.15 *usable moving surface, n*—area of the moving surface that is clear of any obstructions that would impede normal foot motion including the portion of the stride prior to initial foot fall and therefore accessible for normal use.

3.3.15.1 *Discussion*—Where no obstructions exist, the tangency point of the roller and the belt is considered the end of the usable surface.

3.3.16 *user support means, n*—see *handrail*.

4. Design Requirements

4.1 *Stability*—The treadmill shall be stable during intended use. It should be noted that treadmills have unique stability issues beyond those specified in Specification F2276. Refer to Test Methods F2106 for testing guidelines.

4.2 *Exterior Design:*

4.2.1 The rear roller of the treadmill shall be designed or guarded to reduce the risk of finger entrapment. The guard or design shall function through the full range of inclination possible and through the full range of belt tension adjustment. The guard configurations shown in Fig. 2 are suggestions that may reduce the risks associated with this area. Fig. 2 assumes that the treadmill is maintained and adjusted per manufacturer's recommendations.

4.2.1.1 The intention of Fig. 2 is to show some possible alternatives that have been used previously on treadmills to guard the rear roller area. This figure is not intended to limit alternatives that may more effectively address the hazard that is present at the rear roller. The function of the guard is to minimize the possibility of finger entrapment between the roller and the moving surface and between the frame and the end of the roller without introducing an undo tripping hazard to the user of the treadmill.

4.2.2 Electrical elements shall be guarded so as to meet or exceed UL 1647.

4.2.3 All treadmills shall be equipped with foot rails to facilitate user mounting and dismounting.

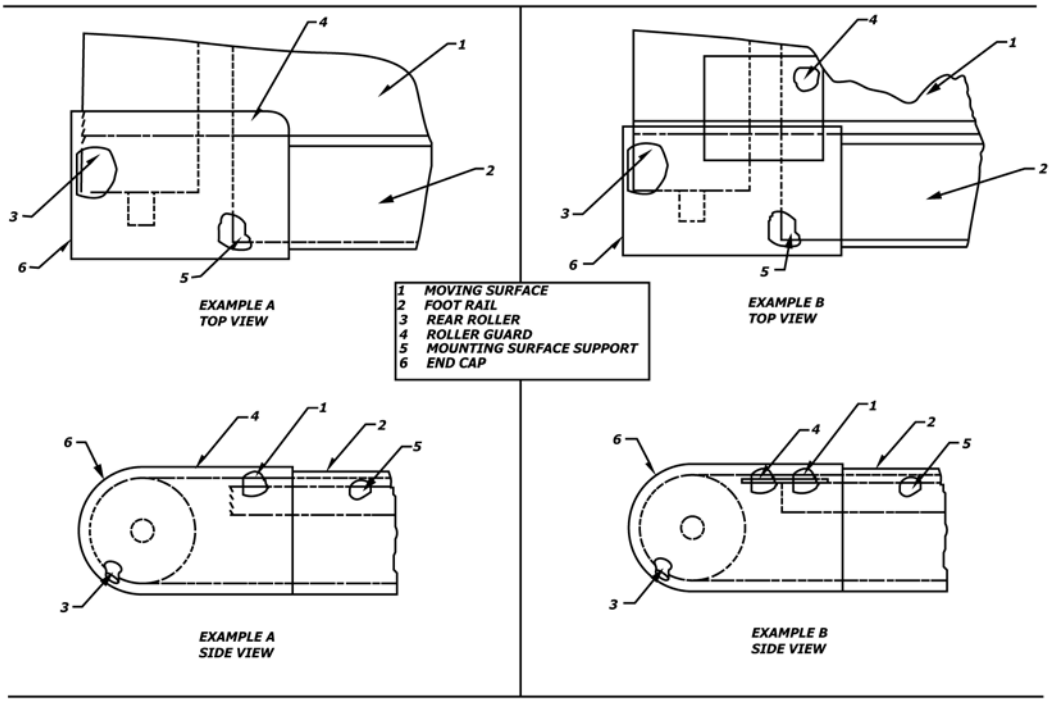

FIG. 2 Examples of Rear Roller Guarding

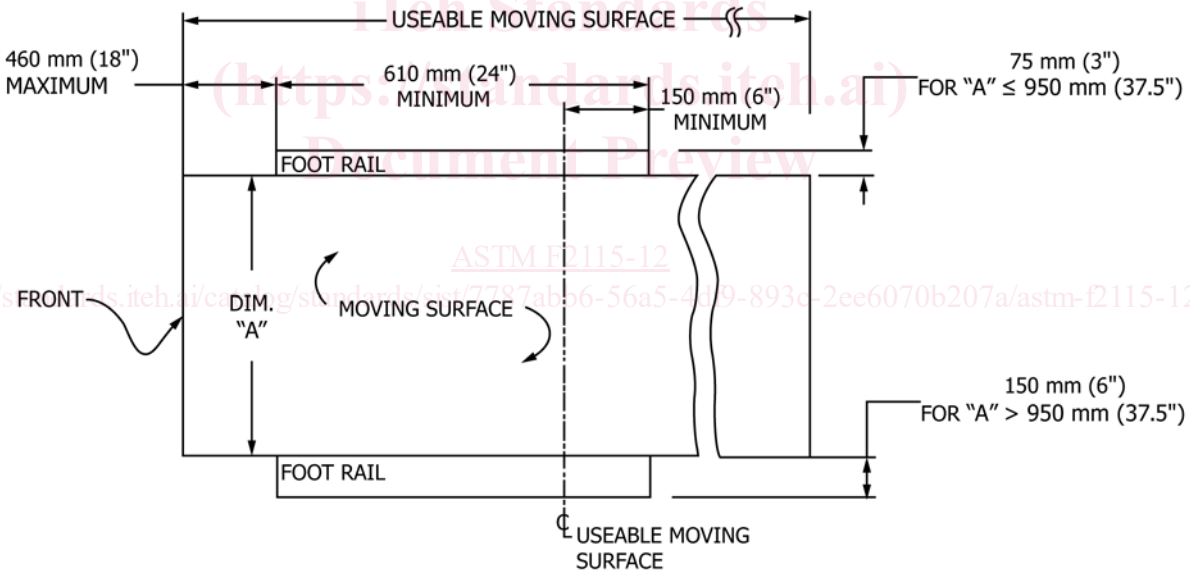

FIG. 3 Top View of Required Foot Rail Dimensions

4.2.3.1 Foot rails shall be a minimum of 610 mm (24 in.) long and adjacent to the moving surface. They shall cover, as a minimum, from within 460 mm (18 in.) of the forward edge of the usable moving surface and at least 150 mm (6 in.) beyond the center of the usable moving surface. See Fig. 3.

4.2.3.2 For foot rail lateral spacing of 950 mm (37.5 in.) or less, the minimum foot rail surface width dimension shall be 75 mm (3 in.). For foot rails spaced greater than 950 mm (37.5 in.), the minimum foot rail surface width dimension shall be 150 mm (6 in.). See Fig. 3.

4.2.4 *Moving Surface:*

4.2.4.1 The moving surface shall be constructed to minimize foot slippage.

4.2.4.2 On institutional treadmills, visual movement markings shall be provided on the moving surface. These markings shall be permanently affixed to, or be part of, the moving surface. These markings shall be of a contrasting color to the rest of the moving surface. A portion of these markings shall always be visible when the moving surface is in operation. The markings shall be a minimum width of 50 mm (1.97 in.) by a minimum 150 mm (5.90 in.) in length. Between two markings a minimum space the size of one marking shall be provided.