



Standard Specification for Basic Tumbling Mats¹

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1. Scope

1.1 This specification describes the characteristics and use of a basic tumbling mat. The intent of this specification is to provide a mat that will minimize the potential dangers associated with basic tumbling exercises.

1.2 This standard is not intended to apply to advanced tumbling activities that may require different performance tests and parameters as defined by various national and international gymnastics and tumbling organizations.

2. Referenced Documents

2.1 *ASTM Standards*:²

F 355 Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials

3. Terminology

3.1 *Definitions of Terms Specific to This Standard*:

3.1.1 *basic tumbling, n*—refers to all skills listed in the United States Gymnastics Federation (USGF) Safety Manual section entitled “Floor Exercise and Tumbling Skill Progression,” except the following skills:

3.1.2 forward salto,

3.1.3 backward salto,

3.1.4 aerial cartwheel,

3.1.5 round off flip-flop backward salto (tuck), and the

3.1.6 russian lift forward salto.

3.1.7 *basic tumbling mat, n*—a resilient surface upon which gymnastic tumbling activities are performed.

3.1.8 *playing surface, n*—the area of the mat surface on which tumbling activities are performed, excluding any safety area.

4. Materials and Manufacture

4.1 The manufacturer shall supply as part of the purchase of a basic tumbling mat the following items:

- 4.1.1 *Core*, made of a shock absorbent material;
- 4.1.2 *Cover*, which may be separate from or an integral part of the core;
- 4.1.3 *Instructional Materials*;
- 4.1.4 *Assembly Instructions* (where applicable);
- 4.1.5 *Care and Maintenance Instructions*;
- 4.1.6 *Sources of Instructional Materials Specific to Use*; and
- 4.1.7 *Warning Labels*.

5. Performance Requirements

5.1 The appropriate governing association shall specify the mat(s) size(s). See **Appendix X1** for listings of associations and their addresses.

5.2 Test the mat, core, and cover combined for shock attenuation properties using Test Method **F 355**, Procedure A, with an impact velocity of 424 cm/s (167 in./s).

NOTE 1—424 cm/s is equivalent to a free fall drop of 91 cm (3 ft). The impact velocity is specified, rather than drop height, because of varying degrees of friction in the guide rails of the equipment.

5.3 The maximum severity index shall be 350.

5.4 Design the cover of the mat so there is a smooth playing surface.

5.5 The playing surface normally shall be one piece. If more than one section is used, securely fasten both sections together with a stepoff of no greater than 1.5 mm ($1/16$ in.).

6. General Requirements

6.1 With each mat, the manufacturer shall supply materials clearly marked: “These are assembly, care, maintenance and instructional materials. Read carefully before assembling and using this mat.” The package shall contain the following items:

6.1.1 *Assembly Instructions*—Unless specified otherwise in the rules of the organization governing the competition, place the tumbling mats on a firm, level surface at least 1.8 m (6 ft) from walls, obstructions or protrusions. The minimum overhead clearance of 3.7 m (12 ft) is recommended.

6.1.1.1 Use the mat in well-lighted areas. If artificial illumination is provided, it is recommended that such artificial illumination meet the standards for gymnasiums and field houses in the Illuminating Engineering Society (IES) RP-6, Recommended Practice for Sports Lighting.

6.1.1.2 Place the mat in an area where traffic flow from the tumbling activity does not conflict with other activities.

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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.

6.1.2 *Care and Maintenance*—Include the following statement with the manufacturer’s care and maintenance instructions for the mat: “Inspect the tumbling mat before using and replace or repair any worn cover or core.” The following conditions represent potential hazards:

- 6.1.2.1 Punctures, holes, tears in the cover,
- 6.1.2.2 Deterioration in the stitching of the mat,
- 6.1.2.3 Separation in the underlying foam, not visible because of the top covering,
- 6.1.2.4 Observed uneven surfaces of the mat, and
- 6.1.2.5 Deteriorated core material.

6.1.3 *Instructional Materials* (See [Appendix X2](#))—Include with the instructional materials sent with the mat information on obtaining the USGF Safety Manual and the American Association (AA) for Cheerleading Coaches and Advisors Safety Manual (see [Appendix X1](#)). Also include a wall chart with the instructional materials that contains the following statements:

6.1.3.1 **Warning:** *Any activity involving motion, rotation or height may cause serious accidental injuries resulting in paralysis or death;*

6.1.3.2 *Do not use basic tumbling mats without qualified supervision;*

6.1.3.3 *Wear appropriate attire. Do not wear any jewelry;*

6.1.3.4 *Consult your instructor/supervisor before using the basic tumbling mat to make sure it is properly positioned and secured and that it is appropriate to the exercise being considered.*

6.1.3.5 *Use appropriate warm-up exercises before attempting new or vigorous moves, or both.*

6.1.3.6 *Only attempt new skills in proper progression. Consult your instructor/supervisor.*

6.1.3.7 *When attempting a new or difficult skill, a qualified spotter should be used. When in doubt, always use a spotter and check with your instructor/supervisor first.*

6.1.3.8 *Safe landings require proper landing techniques. Landing on head, neck or back may result in paralysis or death.*

6.1.3.9 *Any skill involving the inversion of the body could be dangerous and cause serious neck or head injury; and*

6.1.3.10 **“NO HORSE PLAY”** *at any time while using the basic tumbling mat.*

6.1.4 *Warning Statement*—Include the following warning statement in the literature package:

“Any activity involving motion or height creates the possibility of accidental injuries. This mat is intended for use *only* by properly trained and qualified participants under supervised conditions. Use without proper supervision could be *dangerous*, resulting in permanent and complete paralysis and *should not* be undertaken or permitted. Before using, *know your own limitations* and the limitations of this mat. If in doubt, always consult your instructor/supervisor. Avoid landing on head, neck or back, as paralysis or death may result.”

7. Markings

7.1 Mark each mat as specified in the rules for the appropriate governing association. See Appendix X1 for listing of associations and their addresses.

7.2 Clearly mark or label each mat to show the name of the manufacturer or seller.

7.3 Attach the warning statements on the top surface at each end of the mat. Include the following statement:

Warning: This is a general purpose mat for tumbling activities *only*. It is *not* to be used as a dismount or landing mat.

Any activity involving motion, rotation, or height may cause serious accidental injuries resulting in paralysis or death.

This mat is intended for use *only* by properly trained and qualified participants under appropriate supervision. Use without proper supervision could be *dangerous*, resulting in paralysis or death and should *not* be undertaken or permitted.

Before using, *know your own limitations* and the limitations of this mat. Always consult your instructor/supervisor prior to using this mat. Avoid landing on head, neck or back as catastrophic injury, including paralysis or death may result.

7.4 Permanently mark (for example, paint-stencil, mold, sew, or indelibly stamp) the tumbling mat as specified in [7.1](#) and [7.2](#). Ensure that the markings are not readily removable or subject to obliteration during normal use or when subjected to reasonable foreseeable damage and abuse. Ensure that cautionary markings appear in the background by a contrasting color and are clearly visible and legible.

8. Keywords

8.1 basic tumbling; mats; severity index; tumbling mats



APPENDIXES

(Nonmandatory Information)

X1. RULES WRITING ASSOCIATIONS

“United States Gymnastics Federation (USGF) Safety Manual,” Pan American Plaza, Suite 300, 201 South Capital Avenue, Indianapolis, IN 46225.

“National Collegiate Athletic Association-Gymnastic Rules for Men,” P.O. Box 1906, Shawnee Mission, KS 66222.

“National Collegiate Athletic Association-Gymnastic Rules for Women,” P.O. Box 1906, Shawnee Mission, KS 66222.

“National Federation of State High School Associations Boys Gymnastic Rule Book,” P.O. Box 20626, Kansas City, MO.

“National Federation of State High School Associations Girls Gymnastic Rule Book, P.O. Box 20626, Kansas City, MO.

“American Association for Cheerleading Coaches and Advisors (AACCA) Safety Manual,” P.O. Box 18984, Memphis, TN 38181.

“United States Diving, Inc., Gymnastic Mats in Diving Programs, Pan American Plaza, Suite 430, 201 South Capital Avenue, Indianapolis, IN 46225.

X2. TEACHING METHODS AND PROGRESSION LITERATURE

X2.1 The following sources of instructional and safety literature are required for inclusion with supplied materials from the manufacturers:

Sports Illustrated Women’s Gymnastics 1 the Floor Exercise Event by Tonry, D., Lippincott & Crowell.

Gymnastics Guide 1980–82, AAHPERD’s National Association for Girls and Women in Sports.

Safety in Gymnastics, Carr, G. A., Hancock House.

“Gymnastics Safety Manual,” Wettstone, E., Penn State Press.

Tumbling and Balancing: Basic Skills and Variations, Gedeney, J., Prentice-Hall.

Illustrated Handbook of Gymnastics, Tumbling and Trampoline, Boone, W. T., Parker.

Better Gymnastics: How to Spot the Performer, Mountain View, CA: Anderson World.

Biomechanics of Women’s Gymnastics, George, G. S., Prentice-Hall.

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