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An American National Standard

Standard Specification for Competition Wrestling Mats[1]

This standard is issued under the fixed designation F 1081; 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.

ε[1] NOTE—Precision and Bias section was added and warning notes in Sections 8.3 and 11.2 were updated in September 2003.

1. Scope

1.1 This specification covers competition wrestling mats used at the high school and college levels. All mat constructions are included, except felt-core mats enclosed in sewn covers. The intended use of this standard is for the qualification of construction designs.

NOTE 1—The known constructions, as of the issuance of this specification are: (*1*) closed-cell foam cores with polyvinyl chloride (PVC) or PVC copolymer coatings, or both, which are integral parts of the mat; (*2*) closed-cell foam cores with attached fabric cover; (*3*) foam cores, either open- or closed-cell enclosed in sewn, loose covers, and (*4*) molded open-cell PVC foam with a dense skin on one surface which is an integral part of the mat.

NOTE 2—There is no equivalent ISO standard.

1.2 This specification covers mats used in the two major styles of wrestling: U.S. collegiate or high school, and international free style.

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

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 and health practices and determine the applicability of regulatory limitations prior to use.* See Note 5 and Note 7 for specific hazards statements.

2. Referenced Documents

2.1 *ASTM Standards:*

D 412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension[2]

D 1056 Specification for Flexible Cellular Materials-Sponge or Expanded Rubber[3]

D 1682 Methods of Test for Breaking Load and Elongation of Textile Fabrics[4]

F 355 Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials[5]

2.2 *National Collegiate Athletic Association Document:*[6]

NCAA Official Wrestling Rules

2.3 *U.S. Wrestling Federation Document:*[7]

International Wrestling Rules, Freestyle, and Greco-Roman

2.4 *National Federation of State High School Associations Document:*[8]

Official High School Wrestling Rules

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *coating*—Polyvinyl chloride (PVC) or PVC copolymer, or both, or other suitable polymeric materials.

3.1.2 *cure*—Evaporation of solvents from coating and coated foam mats only.

4. Classification

4.1 Classify mats in accordance with the style of wrestling being performed.

4.2 The classifications are:

4.2.1 *Type I*—U.S. collegiate or high school style wrestling.

4.2.2 *Type II*—International free style wrestling.

5. Significance and Use

5.1 The mats shall be constructed to yield the values listed in Table 1 throughout the mat area under the conditions of the manufacturer's warranty.

5.2 Special requirements for the mats shall be subject to purchase agreements. Special requirements shall never reduce any of the basic requirements listed in this standard.

5.3 Good manufacturing practices shall be used in the construction and inspection of the mats.

[1] This specification is under the jurisdiction of ASTM Committee F08 on Sports Equipment and Facilities and is the direct responsibility of Subcommittee F08.12 on Gymnastics and Wrestling Equipment.

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[2] *Annual Book of ASTM Standards*, Vol 09.01.

[3] *Annual Book of ASTM Standards*, Vol 08.01.

[4] Discontinued–see 1990 *Annual Book of ASTM Standards*, Vol 07.01.

[5] *Annual Book of ASTM Standards*, Vol 15.07.

[6] NCAA, Shawnee Mission, KN 66222.

[7] US Wrestling Federation, 405 West Hall of Fame Ave., Stillwater, OK 74074.

[8] National Federation of State High School Associations, P.O. Box 20626, Kansas City, MO 64195.

TABLE 1 Performance and Physical Property Values for Wrestling Mats

Property	Section	Test Method	New	Recondi-tioned	Used-Rejection Level
G_{max}	13.2				
at 430 cm/s (170 in./s), max		F 355	100	100	...
Thickness, mm (in.), min	13.3	D 1056	25 (1.00)	25 (1.00)	20 (0.80)
Tensile strength	13.4				
Foam construction, min, N/mm (lbf/in.)		D 412	8 (50)	...	...
Fabric-covered, min, N/mm (lbf/in.)		D 1682	8 (50)	...	...

6. Physical Properties

6.1 *Tensile Strength*—The minimum tensile strength of the cover and foam system shall be 8.8 N/mm (50 lbf/in.).

7. Performance Requirements

7.1 The requirements listed in this section and in Table 1 are minimal for new and reconditioned mats.

7.2 *Shock Absorption*:

7.2.1 Determine the shock absorption properties of the mats in accordance with Procedure A of Test Method F 355.

7.2.2 The maximum g_{max} values for the mats shall be as listed in Table 1.

NOTE 3—Under the specified test conditions (that is, missile size, impact velocity, etc.), lower g_{max} values indicate better shock-absorbing properties.

7.2.3 Replace or recondition the mats when the g_{max} in the visibly deteriorated areas exceed the values listed in Table 1.

7.3 *Thickness*:

7.3.1 The thickness of the new or reconditioned mat shall be sufficient to provide the shock-absorption properties listed in Table 1, but never less than the minimum values in Table 1.

7.3.2 Replace or recondition the mats when the thickness in the visibly deteriorated areas falls below the values listed in Table 1, or fails to provide the necessary shock absorption. It is strongly recommended that the mat owner test the mat periodically to determine when to replace or recondition a mat.

NOTE 4—Contact the manufacturer if help is needed in testing the mat.

7.4 The surfaces shall be smooth and free of step-offs or depression greater than 1.6 mm (1⁄16 in.).

8. General Requirements

8.1 Competition wrestling mats normally are produced in sections which are assembled prior to use. These sections shall be fastened securely together, using an adhesive coated tape or other means, to prevent their becoming separated during use.

8.2 A mat shall have a maximum of 20 sections, unless otherwise specified.

NOTE 5—Twenty sections are needed for a 12.8 by 12.8-m (42 by 42-ft) molded open-cell PVC mat. Typically, other types of mats would have up to three sections.

8.3 Mats of the coating/foam construction shall not be used if any areas of the coating are missing. (**Warning—**Areas of mats of coating/foam construction having missing coating are considered health hazards.)

NOTE 6—Mats should be cleaned and sanitized daily, or after each use, as recommended by the manufacturer.

9. Dimensions

9.1 The mats shall meet the requirements for minimal dimensions and markings given in the rules of the National Collegiate Athletic Association, the U.S. Wrestling Federation, and the National Federation of State High School Associations.

9.2 The length and width dimensions of the mats shall be as given in the appropriate rule book.

10. Workmanship, Finish, and Appearance

10.1 The mats shall be made using manufacturing procedures which ensure that the bonds between the strips or sections, or coating, or all three, are complete and secure.

NOTE 7—The finish shall be uniform in color for each color used normally with a semi-glossy finish for the coatings.

10.2 On mats with sewn covers, the cover may be loose (that is, not adhered to the foam), but should have no wrinkles or seams exposed that will injure the wrestlers or cause them to trip.

10.3 Sectional mats shall have sections that fit together securely, so they do not separate in use, with maximum step-offs between sections of 1.6 mm (1⁄16 in.) for new mats.

11. Specimen Preparation

11.1 The test specimens may be a finished mat, a section cut from a finished mat, or a smaller sample made at the same time and with the same construction and materials as the mat.

11.2 Coated mats must be aged to "cure'' the mats before testing. This is necessary to ensure the evaporation of solvents from the coating and foam core. (**Warning—**Unreliable data will result from mats containing solvents.)

NOTE 8—Curing is affected by environmental factors.

11.2.1 The length of the "curing'' time will vary and should be determined by consultation with the mat manufacturer.

11.2.2 This "curing'' time is in addition to the environmental conditioning prior to testing.

12. Test Methods

12.1 Conduct the tests at a temperature of 23 ± 2°C (73.4 ± 3.6°F) and 50 ± 5 % relative humidity, unless otherwise specified.

12.2 The shock absorption properties of the mats shall be determined using Test Method F 355 with the following conditions:

12.2.1 Procedure A, cylindrical missile.

12.2.2 Impact velocities of 432 ± 22 cm/s (170 ± 9 in./s).

NOTE 9—Impact velocity, rather than a drop height, is specified to eliminate the problem of friction on the guide rails of the missile. Minor amounts of friction can be overcome by simply increasing the drop height. Cleaning or lubricating, or both, the guide rods and bearing will normally eliminate greater amounts of friction.

12.3 Measure the thickness as outlined in Specification D 1056, or as specified by agreement between the purchaser and the supplier.

12.4 *Tensile Strength*:

12.4.1 *Coated Mats*—Use Method A, die A, as described in Test Methods D 412 except that the results shall be expressed in N/mm (lbf/in.). The test specimens shall be 6 mm (0.25 in.) thick and include the PVC coating and cut parallel to the long dimension of the sheets or strips of foam from which the mat is fabricated.

12.4.2 *Fabric-Covered Mats*—Cut specimens longitudinally from the cover fabric and test in accordance with Test Method D 1682. The results shall be expressed in N/mm (lbf/in.).

12.4.3 *Molded, Open-Cell PVC Mats*—Measure and outline the tensile strength as outlined in 13.4.1. Cut the specimens so they include the playing surface skin.

13. Product Marking

13.1 Each mat shall have appropriate warning labels permanently attached to the performing surfaces.

14. Precision and Bias

14.1 For statements of precision and bias, see Test Method F 355.

15. Keywords

15.1 mats; wrestling