



Standard Test Method for Vertical Rebound Characteristics of Sports Surface/Ball Systems; Acoustical Measurement¹

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1. Scope

1.1 This test method covers the quantitative measurement and normalization of the vertical rebound produced during impacts between athletic balls and athletic surfaces.

1.2 Measurements may be conducted on nonathletic surfaces to test the performance properties of the ball.

1.3 Measurements may be conducted using nonathletic balls to test the performance properties of the surface.

1.4 The values stated in metric units are to be regarded as the standard. The inch-pound units given in parentheses are for reference only.

1.5 The methods described are applicable in both laboratory and field settings.

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 *DIN (Deutsches Institut für Normung):*²

18032 Part II, 1991 Section 5.8

2.2 *British Standards:*³

7044, 1990, Section 2.1

3. Terminology

3.1 Definitions:

3.1.1 *area elastic surface, n*—surfaces where the energy at impact is dispersed throughout an area significantly larger than the impact point (for example, sprung wooden basketball floors, poured urethane floors over sprung subfloor). Area elastic surfaces tend to produce a noticeable vibration when impacted.

3.1.1.1 *subfloor, n*—any structural members found between the playing surface and the underlying concrete base. Subfloor

systems are typically found in sprung indoor playing surfaces and can include but are not limited to: layers consisting of sheets of plywood, layers consisting of strips of plywood, and solid-wood members.

3.1.2 *athletic surface, n*—an athletic surface appropriate for the sport(s) of interest should be selected for testing. The surface may be selected from previously installed surfaces and tested in its complete form, or smaller samples may be tested under laboratory settings.

3.1.3 *coefficient of restitution (CR), n*—the ratio of rebound height to release height. This parameter is useful for noninflated balls that are found to be damaged by impacts with a concrete reference surface. Construction differences and sensitivity to inflation pressure make this parameter inappropriate for comparing different playing surfaces based on results obtained using inflated sporting balls.

3.1.4 *point elastic surface, n*—surface where the energy at impact is dispersed throughout an area that negligibly exceeds the impact point (for example, natural turf, artificial turf, poured urethane surfaces). Point elastic surfaces do not produce noticeable vibrations when impacted.

3.1.5 *reference surface, n*—any section of a concrete slab with a smooth uniform, uncracked surface with a minimum horizontal dimension of 30 cm (12 in.) that produces a rebound with minimal horizontal movement.

3.1.6 *sporting ball, n*—a sporting ball appropriate for the sport(s) of interest should be selected for testing. The test ball should be inspected to verify that it is spherical and devoid of bulges. Bulges indicate structural damage exists within the ball, that could affect the testing results. In the case of inflated sporting balls, the pressure should conform to manufacturer's guidelines.

3.1.7 *vertical rebound height, n*—the highest height achieved by sporting ball during its first rebound after contacting the surface.

3.1.8 *vertical rebound ratio (VRR), n*—the ratio of the rebound on the test surface to the rebound on the reference surface, expressed as a percentage. This parameter may not be appropriate for all sporting balls, as some may experience damage when impacting the reference surface. When reference

¹ This test method is under the jurisdiction of ASTM Committee F08 on Sports Equipment and Facilities and is the direct responsibility of Subcommittee F08.52 on Miscellaneous Playing Surfaces.

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² Available from DIN, Burggrafenstrasse 6, D-10787 Berlin, Germany.

³ Available from BSI, 389 Chiswick High Road, London W4 4AL, UK.