

## Raising the Game

# Reviewing ASTM F2772 for Indoor Sports Flooring Systems Specification

Today's athletes require sports flooring that can hold up to the rigors of use while also providing optimal ergonomics and safety. ASTM F2772 is the only material testing method recognized in the United States by the American Society for Testing and Materials [ASTM] for indoor sports flooring. Reviewing this standard for the specification of indoor sports floor systems can help architects, contractors and designers make appropriate specification decisions for their facilities.

ASTM F2772 was designed to certify and classify resilient surfaces made specifically for sports and recreation activities. To ensure that surface materials meet the criteria to be classified in one of the five classes of sports floors [Class I-Class V], the ASTM F2772 test standard measures four characteristics of performance, including Force Reduction, Ball Rebound, Surface Finish Effect, and Vertical Deformation. A floor must meet all four of these criteria to be compliant with the current ASTM F2772 standard for indoor sports and multi-purpose flooring. Diving deeper into each of these criteria reveals how the standard ensures that a flooring solution will offer the appropriate level of force reduction and safety during both recreational use and intense sports activity.



## Force Reduction (ASTM F2569)

The first factor is force reduction and this portion of the ASTM F2772 standard is tested in accordance with ASTM F2569. A surface's force reduction is measured as a percentage of how much of the total force of an impact is reduced by the surface. This test is focused on impacts generated by the lower extremities and per ASTM F2569, a surface's force reduction may be an "indicator of its

performance, safety, comfort, or suitability of the surface."

When a floor absorbs the shock of impacts, it can help mitigate the negative stress and strain of impacts that an athlete feels throughout their entire body. The proper balance of Force Reduction and Energy Restitution is what will create an ergonomic and comfortable surface, and

the ideal balance is based on the activities performed in the space.

### Ecore's Sports Floor Offerings:

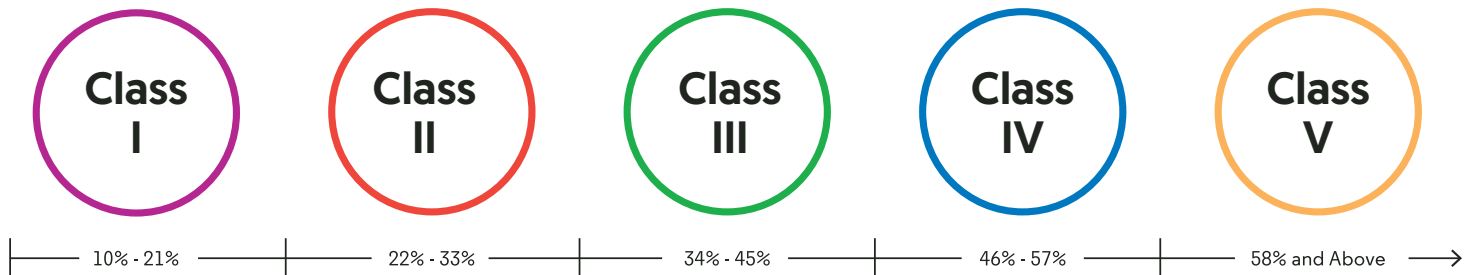
#### Class I

- Baller Motivate Class I
- Bounce 2 Motivate Class I

#### Class II

- Baller Rally Class II

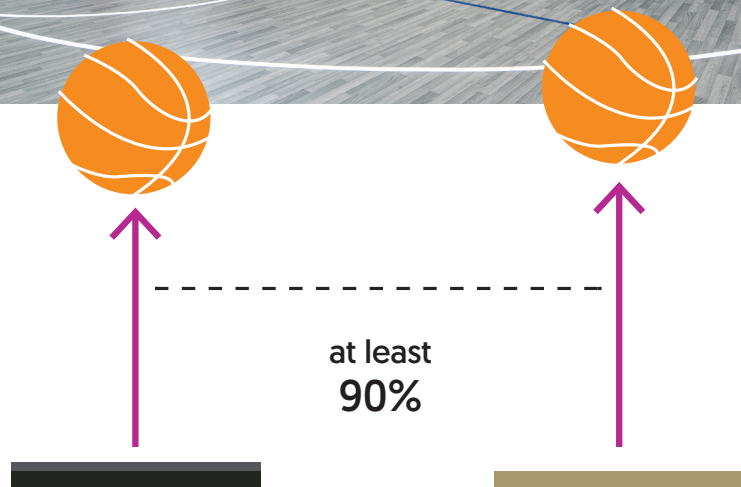
### FORCE REDUCTION



## Ball Rebound (ASTM F2117)

The way a ball interacts with the playing surface can dramatically affect how a game is played, so it is important the sports floor does not affect a ball's ability to bounce. For example, if a basketball game is being played on a synthetic sports floor, the ball should bounce back similarly to how it would on a hardwood basketball court.

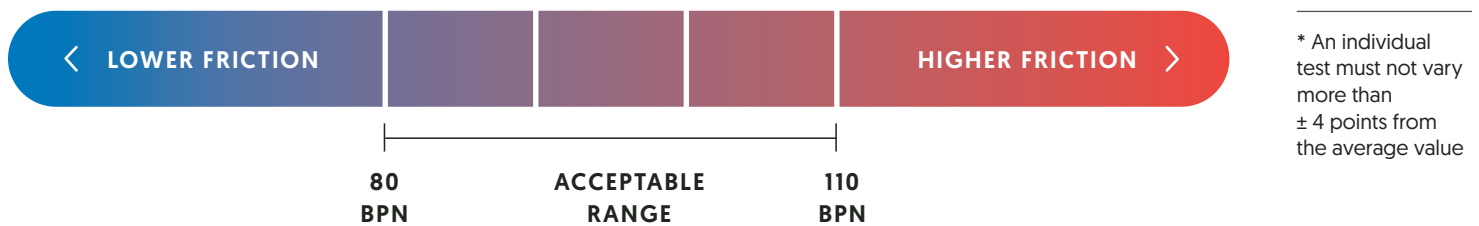
The ball rebound portion of the ASTM F2772 test standard is measured in accordance with ASTM F2117. It is calculated by taking the difference in bounce height, when a ball is bounced on the sports floor, compared to concrete. The average of multiple drop points on the floor must meet or exceed 90% of the rebound height of a ball dropped on concrete. Any one test point cannot differ by more than 3% from the average rebound height. This requirement is to ensure that the sports surface performs uniformly throughout the court.



## Surface Finish Effect (ASTM E303)

The surface finish effect portion of the ASTM F2772 test standard measures a surface's frictional properties. Also known as "slide effect," this portion of the standard is important to ensure the surface provides the optimal level of traction for an athlete. When athletes are competing, it is important that the floor is not too slippery, so that they can change directions and eliminate the worry of falling. However, it is also equally as important that the floor does not have too much "grab," because this can also increase the risk of injuries.

The optimal level of friction can vary depending on the sport that is being performed in the space. To meet the ASTM F2772 test requirements, the surface must provide a value between 80 and 110 in accordance with the ASTM E303 test standard. The surface must also provide uniform (+/- 4 points from the average) results when tested in different locations throughout the space.



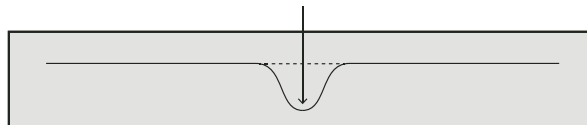
## Vertical Deformation (ASTM F2157)

Vertical Deformation measures the ability of the surface to deform under a load. The amount that a surface deflects or "gives" under an athlete's foot or under a table, chair, or other heavy load can contribute to creating a safer and more stable floor that reduces injuries. On the other hand, a surface that deforms too much will result in an unstable surface that may contribute to causing injuries as a result of impact forces.

There are three general flooring types to consider when looking at the vertical deformation of sports surfaces that are measured in accordance with ASTM F2157: point-elastic, area-elastic, and combination-elastic.

### Point-Elastic Sports Floors

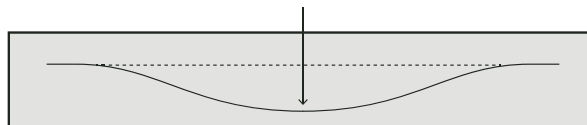
A point-elastic floor (most commonly synthetic sports floors - poured urethanes, vinyl, or rubber) will have a surface that only deforms in a small area around the load. These surfaces must not deflect more than 3.5mm (0.138"), at any point, to pass.



Vertical Deformation < 3.5mm

### Area-Elastic Sports Floors

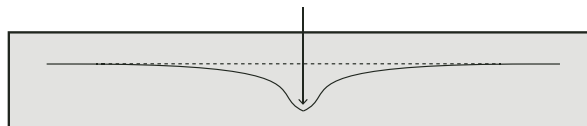
An area-elastic floor (most commonly floors made of wood) will have deflection in a large area under a load. Area-elastic floors are classified as either Class A or Class B. Class A floors provide a value of vertical deformation between 1.8 and 5mm, and Class B floors provide a value less than 1.8mm.



Vertical Deformation  
Class A: 1.8-5mm  
Class B: < 1.8mm

### Combination-Elastic Sports Floors

A combination-elastic floor (has a point elastic upper layer in combination with a rigid structural layer and resilient support components and it will have deflection in both the small area around the load contact point as well as the larger area under the load. The point elastic surface must provide a deformation value between 0.5mm and 2mm (0.020" - 0.079"), and the area elastic subfloor must provide a deformation value between 1.8mm and 5mm (0.071" - 0.197").



For all system types, any individual test point should not deviate more than 0.7mm from the average deformation value.



## The Ecore Difference – Providing MORE: ASTM F970

In addition to achieving exceptional test results in the ASTM F2772 test standard, Ecore's sports floor's performance in the ASTM F970 test standard makes them the ideal multi-purpose sports and fitness floor.

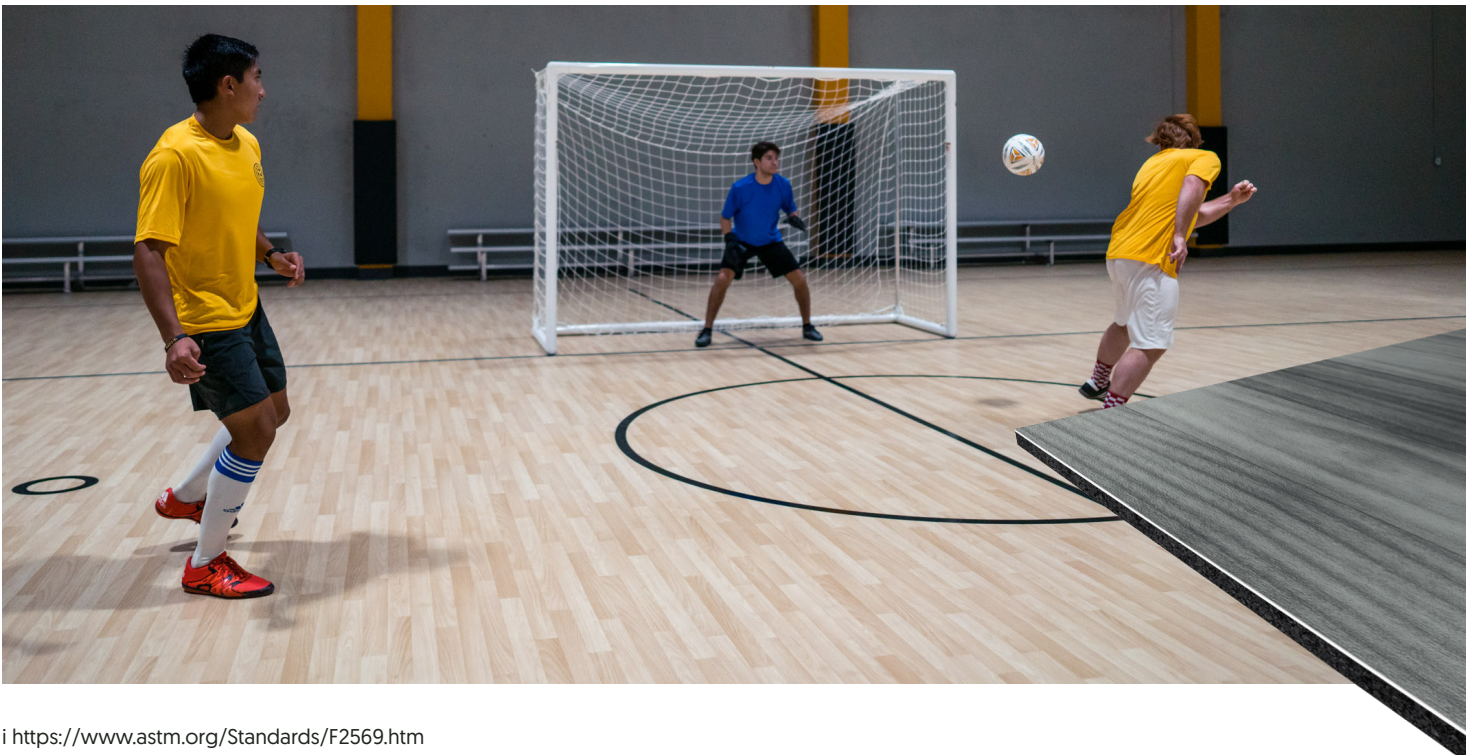
The ASTM F970 is the standard test method for measuring recovery properties of floor coverings after static loading. Specifically, it measures the indentation depth on a flooring product after a heavy static load has been removed from its surface. A certain amount of pressure (standard 250 psi), measured in pounds per square inch (PSI), is applied to the floor for 24 hours. The load is then removed, and the flooring product sits for 24 hours. After 24 hours, the indentation is measured and recorded. The final recorded number is the depth of the indentation that is left in the flooring product after 24 hours.

Ecore sports floors also feature itsTRU™ technology, which is the fusion bonding of a vulcanized composition rubber (VCR) “base layer” to a 2mm heterogeneous vinyl sheet. This muscle gives Ecore's products superior energy restitution, which offers next generation results for residual indentation recovery for point and rolling loads in addition to returning energy to the athlete.

Because of the VCR base layer, Ecore sports floors respond very well to heavy loads. VCR inherently wants to keep and return to its original shape. It does not flatten out and permanently indent over time like most foam-backed products. Conversely, the energy inside VCR allows it to return to its original shape over time. Ecore's Motivate Class I sports floors are the ideal solution for multi-purpose rooms.

These properties make Ecore products an ideal solution for multi-purpose spaces. Because Ecore sports floor products respond well to heavy loads, a variety of activities can take place in the same space without sacrificing floor performance from one activity or sport to the next. With Ecore products, the same surface can be used on the playing court as well as under tables and chairs, if the space also functions as a cafeteria or assembly room, making it a perfect choice for multi-purpose areas.

New technologies have made it possible for sports flooring to enhance athlete performance and safety, while delivering aesthetic appeal and versatility. For most sports applications, vinyl, rubber or synthetic turf surface layers can be fused to a composition rubber base layer to provide appealing flooring options that keep athletes at the top of their game.



i <https://www.astm.org/Standards/F2569.htm>