Tom Abendroth, President, Action Floor Systems, LLC, discusses how the right Sports Flooring system can offer a competitive advantage.

**Competitive Advantage**

Competitive advantage is defined as the ability gained through attributes and resources to perform at a higher level than others in the same industry or market. For example, successfully implemented strategies can lift a team to superior performance by facilitating players with the competitive advantage to outperform rival players. To gain competitive advantage, coaches manipulate the various resources over which they have direct control within their team...
acceptable for use at all levels of play, including higher-
level or professional sports facilities where the wood floor
and subfloor system can be customised to the particular
sport that will be played.

Subfloor systems are now engineered to meet the
specific needs of a particular sport, such as volleyball,
squash, or handball, and cover a complete range of
activities from dance and aerobics to basketball. A multi-
purpose floor can be specified to accommodate several
sports to satisfy the different needs of a particular facility.
The combination floor, with a synthetic (pad & pour) run-
ning track around the perimeter and a maple floor in the
middle, consisting of multiple courts over a uniform sub-
floor is the ultimate indoor multi-sports facility. This not
only provides a competitive advantage for the athlete
but also for the facility, thanks to its ability to generate
revenue through hosting a plethora of events.

Constant running and jumping put great strain and
stress on athletes’ ankles, knees and hip joints. Reducing
stress, strain and fatigue is accomplished by the use of
these highly engineered subfloor systems upon which
the flooring rests. These subfloors are designed to pro-
vide force reduction while maintaining ball rebound. The
mission and driving force for athletic floor companies
such as Action Floor Systems is to design and develop
performance floors that not only enhance the sport but
provide maximum comfort and safety for the athlete.

At the high end professional level, the athletes often
train and practice on engineered performance maple
floor systems and then have to accept playing the “big
game” on an old dilapidated movable floor. However, it is
now possible to maintain that competitive advantage
within your floor in arena and coliseum venues thanks to
newer generation padded precision-made maple porta-
ble sport floors for a Friday night basketball game nes-
tled in between a Thursday night hockey game and a
Saturday night rock concert.
In this article, we will highlight three areas that directly affect an athlete’s ability to reduce injury and fatigue:

1. **Shock Absorbency**

Proper shock absorption should be considered as highly important. As an athlete impacts a sports surface, the impacting force is translated into two resultant forces: one absorbed by the floor; and the other returned to the athlete. While hard surfaces such as concrete and asphalt provide little or no force reduction for the athlete upon impact due to running or jumping, a safe sports floor system should absorb a certain amount of these forces and are rated by the percentage of force reduction they provide as compared to hard surfaces. For example, a sports floor with a force reduction value of 40 percent will absorb 40 percent of the impact force and return 60 percent of that force to the athlete. It is widely accepted in the indoor sports flooring industry that the minimal desired percentage is 50 percent. The general majority of wood gymnasium floors installed at high school level and above will meet this rating; however, there are exceptions.

Contrast this to the general majority of synthetic gym floors (rubber, urethane, PVC) installed over concrete, and their average is closer to 30 percent. This is why nearly every athlete, coach, participant, and official will acknowledge that synthetic floors are “harder” and “worse on my joints”. This measurement is widely tested according to the German Institute of Normalisation or DIN standard. The harder the athletic floor (concrete or
resulting impact attenuation for wood versus synthetic floors is therefore very comparable.

Currently, indoor sports floors are not rated by any standard in the measurement of impact attenuation. Architects and decision makers must therefore make their best decision based on the information provided. Shock absorbency ratings are a good comparative measure. Additionally, the American Society of Testing and Materials (ASTM) has conducted studies on the impact attenuation of surfacing materials with playground equipment. This study more directly reflects fall impacts from playground equipment and is certainly not definitive for athletic floors, but it does bare some relevance.

3. Surface Friction

Surface friction, often called the coefficient of friction or sliding coefficient, is used to measure a floor’s ability to control the sliding of athletes on its surface. For an indoor sports floor, the surface friction must be high enough to prevent premature and uncontrollable sliding of athletes on its surface, but also low enough to permit sliding off an extreme force.

Rotating and pivoting motions can create strain on an athlete’s joints unless the floor has the proper friction coefficients. The measurement is in Newtons, and the range for the proper range is 0.5N to 0.7N. To contrast the ranges, ice equates to 0.1N and fly paper is 0.9N. Typically for wood floors, surface friction is a direct function of the finish on the surface. For most types of synthetic floors, the measurement is higher.
The benefits of choosing the right sports flooring system are clear, and this article has proved that competitive advantage is more than just a mindset; with hard work and the right equipment playing a key role.

With over 100 years experience, the MFMA (Maple Flooring Manufacturers Association, www.maplefloor.org) and its members are a great resource when designing and constructing your next maple gym floor.

Herschel Walker once said; “If you train hard, you’ll not only be hard, you’ll be hard to beat”.

In the end, all everyone wants is the competitive advantage to be champions! The gymnasium floor is yet another tool to that end.

Author’s Credits: Tom Abendroth is President of Action Floor Systems, LLC, a company that specialises in high-performance sports floors constructed of hard maple timber grown exclusively in northern Wisconsin and Upper Michigan. Action Floor Systems manufactures a wide variety of hardwood sports floor systems to accommodate any application and is proud to serve the global market place, with headquarters and wood floor manufacturing plant in Mercer, Wisconsin, USA. For more information, visit: www.actionfloors.com or contact Action Floor Systems LLC, 4781 North U.S. Highway 51, Mercer, WI 54547-9708 USA, via Phone: +1 715.476.3512, Fax: +1 715.476.3585, or e-mail: info@actionfloors.com

The maintenance of any of these floors is critical and can affect the measurements. This measurement is also tested according to the German Institute of Normalisation or DIN standard.

Cost Considerations

Beyond performance values of a particular floor system, cost considerations play a leading role in obtaining an edge. Architects and decision maker’s alike struggle to balance performance with budget restrictions, but the gym floor usually accounts for less than 1% of a total project budget. The ROI (Return on Investment) over the life of a wooden gym floor is short, given the life expectancy of 38 years with minimal maintenance. The Maple Flooring Manufacturers Association (MFMA) conducted a life-cycle cost comparison to understand the real costs over a 30 year time frame. The entire report can be found on their website at: www.maplefloor.org.

Reflected below is the original installed price plus manufacturer-recommended maintenance (in US $):

- Northern hard maple $0.79 / sq. ft. / year
- Poured urethane $1.10 / sq. ft. / year
- PVC $1.15 / sq. ft. / year

A 20mm thick Maple floor will allow for up to six to eight sandings and based on use, the life expectancy could be far greater.

Rounding Off

The benefits of choosing the right sports flooring system are clear, and this article has proved that competitive advantage is more than just a mindset; with hard work and the right equipment playing a key role.

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