The overall speed of movement during soccer competition has increased substantially over the past 20 years, but an individual player is in contact with the ball for only for a few seconds throughout the duration of a 90-minute game. In addition to facilitation of ball handling, soccer shoes must support numerous other aspects of performance that are specific to a new style of play. The overall running distance per game is about 7–8 miles (10–12 km). Rapid changes in direction of movement and quick bursts of speed to cross 20–30 meters of distance now dominate the game. Frequently, split-second maneuvers determine which player will control the ball. In addition to traction, the weight of the shoes is an important performance factor, and different playing surfaces present different challenges. Natural grass, artificial turf, and arena grounds (gym floors) require specific shoe sole characteristics. A good soccer shoe enhances performance, while simultaneously protecting the athlete from injury.

Flexibility, Grip, and Cleat Geometry

The shape and positioning of cleats should optimize stability of the foot and ankle joints and facilitate grip on the playing surface during cuts, turns, and quick changes of direction.

Biomechanical testing has resulted in a trend to replace 6-8 round cleats (Figure 1) with a greater number of thin and long elliptical-shaped cleats (Figure 2). Long cleats provide greater slip resistance on the lateral borders of the sole, but produce a suboptimal pressure distribution. Queen et al. found that shoes with fewer and longer cleats generated significantly greater plantar foot pressure than shoes with a greater number of shorter cleats. Combining traditional round-shaped cleats, which are widely popular with players, with thinner cleats has been done in an effort to realize the benefits of both types, which may be advantageous for acceleration. There is ongoing scientific evaluation of new sole and cleat construction that has been designed to facilitate more rapid changes of movement direction (Figure 3). There is conflicting evidence concerning the influence that such shoe characteristics might have on risk for anterior cruciate ligament injury.

For indoor soccer shoes, the combination of different types of rubber sole material provide resistance to foot slippage on the playing surface, while resisting shear forces.
that would otherwise lead to rapid sole deterioration (Figure 4).

Stability

Soccer athletes want a shoe that supports an aggressive style of play; however, a high degree of traction and rapid changes in movement direction may contribute to imposition of excessive stress on joints, muscles, and tendons. The soccer shoe is expected to deliver as much protection and stability as possible. The overall stability of latest generation of soccer shoes is derived from combination of differing materials that are used for construction of the outer sole, midsole, and upper components. The introduction of synthetic materials has allowed for incorporation of stabilizing components into the shoe upper, as well as connection of the outer sole, midsole, and upper components in a manner that permits them to function as a mechanical unit. Villwock et al. analyzed shoe stiffness on different playing surfaces and found that it was determined by the overall construction of the shoe. Torg et al. found that shoe construction and surface temperature influenced the shoe-surface interface release coefficient.

Analysis of a possible relationship between soccer shoe design and injury susceptibility is currently focused on the construction of the midfoot section of the shoe. Torsion of the midfoot, which was reported to have a high rate of occurrence in 2005, has been related to wearing shoes with a flexible sole in the midfoot area (Figure 5). Most manufacturers are now attempting to provide a high degree of flexibility in the area of the metatarso-phalangeal joints, while protecting the midfoot from torsion (Figure 6).

Upper Material

For decades, the upper material of soccer shoes was leather. In recent years, players, have shown interest...