

# New goals for your 'sole mate'

**A** hot new trend has sprung up underfoot in an ancient sport; the sport is soccer and the trend – soccer shoes for women. A quiet revolution in women's soccer has manifested itself in vastly increased worldwide participation. Starting in Europe back in the 1980s, it took the usual US marketing glitz and hoopla to bring the trend to the forefront for soccer boot manufacturers. True, it's hard to design for a consumer that didn't exist before, but women's soccer shoes have become another niche in the expanding market of sports products being designed specifically for women. With the introduction and televising versions of women's professional sports leagues, the growth of the women's market is becoming a reality—and manufacturers are starting to listen. In the US alone, according to the Florida-based Sporting Goods Manufacturers Association, 40% of soccer participants are female and varsity girl's soccer participation has risen 154%, while women's collegiate play has risen 193% since the 1990s. Today's female athletes want true performance in a product, yet they do not want to forfeit style. "It's incorrect to merely have a smaller or lighter product, originally made for men, tagged for women," advises John Riddle, president and CEO of the SGMA.

More women than men now buy athletic footwear, and their demands have now influenced the soccer shoe market. Soccer shoemakers still have to do more research and development for women's lines, but some biomechanical differences between men's and women's shoes have already been established and have led to the creation of a "female identity" in a traditionally male sport. Today, it would be true to say that sophisticated athletic shoe designers are beyond the stage of recognizing that a woman's foot is anatomically different from a man's. This can be successfully translated into the last—on which the basic shape of the shoe is created. A woman's foot is typically narrower than a man's and has a narrower heel relative to the forefoot. Whereas a wide width would be the 'add-on' to medium in a men's range, narrow would be a logical addition to any woman's range. Wide fitting women always have the option to choose a man's shoe. Shoes built on a woman's last reduces the heel slippage that can occur in downsized men's shoes. As it is important for all soccer players to "feel contact with the ball", it is even more important that a woman's soccer shoe fitting be built on a suitably



narrow last. Some shoe companies including Nomis, adidas, Puma, Reebok, Hummel, Diadora and Asics are now developing entire female divisions using women-specific lasts.

### A role in injury prevention

Performance, comfort and injury prevention is what athletic shoes are all about. Shoes for running and walking are designed to absorb shock and control overpronation. Court and aerobic sports tend to emphasise support and lateral/medial control. In soccer — where it is estimated that a player is only in contact with the ball for less than 2% of playing time and runs 12-14 kilometres during a game — the biomechanical demands are different. "The ultimate soccer shoe would be a second skin with studs sticking out", says Antonio Zea, product manager for EU Soccer at adidas. Soccer is one of the few sports where the feet come into contact with a foreign object, namely the ball, on a regular basis. Soccer shoes are often termed "foot gloves", as they are meant to be worn tight and are made from thin leathers or microfibre. Due to the thinness and tightness of soccer boot upper materials, foot bruising and discomfort are common complaints from players wearing competition shoes for long practice sessions. Hence the reason for soccer training shoes that have a little more padding and room than competition models.

Shoe traction plays a role in causing and preventing soccer injuries. Proper traction depends on the playing surface; too little traction may impair running and turning movements, while too much traction increases the risk of ankle and knee injuries.

Movements intrinsic to the game, such as stopping, starting, cutting, and pivoting, frequently lead to lower extremity injuries. According to Nick Romansky, DPM, a podiatrist for the US women's national team, women are particularly susceptible to knee injuries, such as non-contact anterior cruciate ligament ruptures. Shorter studs on women's soccer shoes have been shown to reduce knee and ankle injuries in female collegiate and high school level players. It is therefore recommended that studs on women's soccer shoes for younger players be no longer than one-half inch. "By reducing the number and altering the location of the traction elements, weight and stud pressure can be reduced," notes Nike's Erez Morag, PhD, in a paper he presented to a recent International Football and Sports Medicine Conference. "Shorter traction elements may also increase shoe stability and reduce the risk of injuries."

### The anatomical factor

Although stud length for women's soccer shoes has been a major focus of the R&D divisions of athletic shoe companies, other areas of construction affecting women's shoe development include upper materials, lacing systems and specific cleat patterns. A myriad of

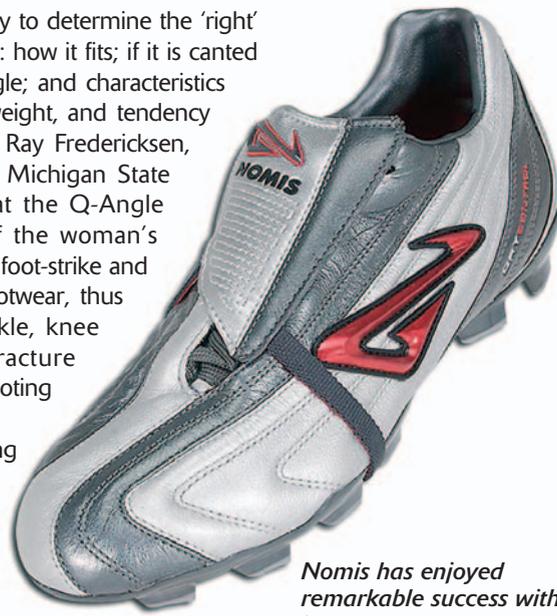
concerns comes into play to determine the 'right' shoe for a woman's foot: how it fits; if it is canted in a varus or valgus angle; and characteristics such as age, comfort, weight, and tendency to supinate or pronate. Ray Fredericksen, MS, a biomechanist at Michigan State University believes that the Q-Angle (Quadriceps Angle) of the woman's pelvis and femur affects foot-strike and can be addressed in footwear, thus helping to prevent ankle, knee and fifth-metatarsal fracture injuries as well as promoting improved performance.

The most distinguishing anatomical feature between men and women is the pelvis. The pelvis of a woman is broader and rounder than a man's so as to facilitate child birth. The thigh bone or femur is also attached to the pelvis at a greater angle. Functionally the centre of gravity is lower for women than men, and the Q-angle is greater from the pelvis down to the knee. This angulation places greater stress at the knee joint of most women making them more vulnerable to misalignment injuries such as anterior cruciate ligament tears at the knee, fourth and fifth metatarsal fractures, peroneal tendonitis, and iliotibial band syndrome. Since women also have narrower heels and a lighter bone structure across the tri-planar axis of the foot, they are more susceptible to over use, leading to compensatory injuries to reduce stress along the medial aspect of the knee joint.

Biomechanical studies at Michigan State University have determined that: women are more flexible, and therefore have greater joint laxity or joint motion; pronate more than men because they strike the ground in a more supinated position on the outside of the feet during footstrike; they compensate to reduce the Q-angle by moving their centre of mass laterally, more to the outside to place the leg in straighter alignment of the foot.

### The weight factor

Researchers say shoe mass has a significant effect on peak foot velocity: the heavier the shoe, the slower the foot. "For every 100 grams of weight that is carried on the foot your oxygen consumption patterns change," states Howard Liebeskind, DPM, a long-time podiatrist with the US women's national soccer team. All things being equal, the player in the lighter shoes will run faster and kick further. As all things are not equal, with men still being stronger than women, it is essential that a shoe designed for a woman should be proportionally lighter than a man's shoe. The choice of material selection and the design incorporated into a woman's soccer shoe can vastly affect the weight, especially in



*Nomis has enjoyed remarkable success with its women's soccer footwear.*

 Nomis

wet conditions. Leather is still the most popular upper material used in soccer shoes – primarily for its ability to mould to the foot and its superior durability, transpiration and abrasion resistance.

Of the natural leathers, kangaroo for its lightness, high tensile strength and softness is most highly prized. Recently, however, water resistant synthetics, such as that used in Nike's Mercurial Vapor model have significantly ramped up the stakes in upper technology. The synthetic upper material used in Vapor technology stays sticky when wet, unlike leather, which, if not treated with a water repellent, gets slick and heavy. Vapor material not only weighs dramatically less than its closest leather competitor, but also remains lighter during play by resisting water saturation. Another popular trend in women's soccer models is to incorporate a narrow or split shank in the outsole in order to reduce weight without sacrificing stability or torsional rigidity. Diadora uses a lightweight frame of threadlike steel wire woven into soccer soles, called Axeler. This technology is designed to increase forefoot flexibility and maximise heel stability.

#### Putting a new spin on the ball

Soccer players need to have a high coefficient of friction when they strike the ball so they can impart spin on it. Both male and female players need to feel contact with the ball for control and accuracy when passing and kicking. Companies such as adidas, Puma and Diadora have been experimenting for many years with asymmetrical lacing systems and "shark scale" surfaces in order to achieve better contact for the foot and more grip when making contact the ball. Adidas Predator technology is perhaps the most recognised upper material treatment that imparts significant spin and control on the ball upon contact. Another brand that is making its mark in the women's soccer shoe market is Nomis which has created a "Control Wet Technology", which is said to give up to sixteen times more grip and control on the ball in all conditions. This leather treatment protects the upper leather from absorbing water and is used on the brand's women's models Black Pearl SG and Nine Pincer Dry Grip. Nomis uses the finest bovine and k-leathers for strength and comfort. Low water absorption (4%) in "Control Wet Technology" results in lighter boots and dry, warm feet in wet conditions.

Nomis soccer shoes have been specially adapted in certain models to fit "the women's and girls' market". Women's ankle and heel bones are a totally different shape compared with men's. The Achilles heel guard has been lowered to prevent rubbing and blistering, and the heel area has been shaped to fit the narrower female heel. Along with existing comfort features, such as padded collars, elasticised tongues, and lower rearfoot heel counters, we are sure these well thought out features will result in many more women wearing Nomis boots.

The traditional all-male black 'football' boot by any other name has become today's pink-trimmed female soccer shoe.

With an estimated 200 million plus players worldwide, soccer is a sexy, high-profile arena in which leading shoemakers compete with zeal to produce biomechanically functional performance footwear for both male and female players.

It's a tall order to make a soccer shoe with sex appeal, but the size of the growing women's market on a worldwide basis easily justifies the shoemakers' research and development time, effort and money. Biomechanics researchers, practitioners, and designers at leading sport shoe brands believe soccer shoes that fit a woman's physiology can forestall injury and may even improve her ability to pivot, push off, plant soundly, and, dare we say...score. 

## Cambrelle®



## Cambrelle® the Gold Standard

When it comes to providing a hard working, high performing shoe lining, Cambrelle® truly sets the pace. With a winning formula of high absorbency, quick drying and durability, it is recognised as the No.1 shoe lining in the World.

This is why the leading global brands line their footwear with Cambrelle®, and why some of the greatest athletes wear Cambrelle®-lined shoes. To keep you and your customers a step ahead of the rest, make sure you use Cambrelle®.

Email: [info@cambrelle.com](mailto:info@cambrelle.com) [www.cambrelle.com](http://www.cambrelle.com)

Cambrelle® is a registered trademark of Camtex Fabrics