Flexible Focus On Applications

A series of practical application studies featuring GLS TPEs

THE APPLICATION

A thin high heel shoe insole pad called the PepnStep™ to provide wearers with desired comfort and relief.

THE SITUATION

Goal to create a new line of high heel sole inserts to provide metatarsus relief with a thin, unobtrusive gel-like insole.

THE CHALLENGE

Develop industry's first ever high heel shoe insole that was soft and cushioning, yet durable and resilient enough to provide a comfortable footbed.

THE OUTCOME

VERSAFLEX® CL2003X 30 Shore 00 TPE with gel-like properties for a small, thin insole provided the right fit and desired comfort.

WELL HEELED: NEW FULL FOOT HIGH HEEL INSOLE PROVIDES SOFT GEL COMFORT

Thany & Brown LLC Partner with GLS Corporation to Make Heels All-Day Comfortable

Swollen feet, bunions, corns, a sore forefoot and painful arches—it's no wonder that podiatrists the world over shun the high heeled shoe. These symptoms are just a few of the complaints women have about wearing high heeled shoes. Despite the prevailing attitude that high heels are painful, women have adopted a love/hate relationship with this stylish footwear. Women love the style, aesthetic, cut, color and fashion of high heels, but hate the discomfort of actually wearing them.

That is, until now. Thany & Brown, LLC of Everett, WA recently partnered with ultra-soft thermoplastic elastomer (TPE) alloy manufacturer GLS Corporation of McHenry, IL, to create a new line of high heel shoe inserts marketed under the PepnStep™ trademark. In a marketplace replete with "high heel comfort solutions", PepnStep promises women metatarsus relief with the only insole that extends the full length of the foot, plus the insole is very thin and fits unobtrusively into the shoe. Most importantly, the very soft TPE insole provides cushioning and relief in the part of the foot that needs the most support when wearing a high heel, the ball of the foot and toe areas.

A Shoe "First"

Moreover, according to Thany & Brown's product developer, owner and manager Marion Brown, the company is the first to offer a high heel insole developed for women by women who actually wear these shoes. In order to provide the fit and comfort that Mrs. Brown's design demanded, she turned to GLS Corporation for a material that was soft, cushioning, yet durable and resilient enough to provide a soft footbed despite hundreds of foot pounds of pressure loading the insole at key pressure points. In essence, what was needed was a material solution that would make a high heel truly comfortable, a very tall order indeed.

All About Sole

Mrs. Brown began her quest for a comfortable high heel when she was just 20 years old. Working as a waitress, her job required wearing heels for the duration of a 6-hour shift. It wasn't

long before her feet began feeling the toll of the long hours in attractive, yet biomechanically challenging footwear. After a busy night, she would attempt to recuperate by walking barefoot, but even that would hurt. Seeking relief, Mrs. Brown began what would become a 20-year quest for the right mixture of shape and materials to provide comfort to women whose lifestyle or even careers require them to wear high heels. This goal drove her to experiment with diverse materials in search of a good home remedy. Utilizing an array of insole materials, such as recycled soles from tennis shoes, and even cut pieces of carpet padding, velvet and cotton -- each met with failure until she got serious about making an insole that would cure the pain of wearing high-heeled shoes, from the sole up, so to speak.

To obtain the needed data to engineer a truly effective insole, she began with a study of both the foot, and the internal "guts" of a typical high-heeled shoe. The shoes revealed that inside the leather and support structure of most footwear, manufacturers simply place some open cell foam on the foot bed and leave it at that. Additionally, the shoes feature a hard interior substructure that retains the shoe's shape, with construction elements like staples under the forefoot and nails under the heel area lurking to create discomfort.

In terms of the foot, the biomechanical challenges are many. When a woman wears a heeled shoe, the pressure on her metatarsus and ball of the foot makes an impression into hard clay of an average of 1", showing that the weight of nearly the entire body is focused on just a few square inches of the body. Loading the foot, which has many nerve endings, in this way on a foot bed that lacks even the most rudimentary support and padding system is a recipe for pain. It's little wonder that 98% of women in a survey stated that high heels hurt. Sales in this category have slipped over the last decade, as a result of such attitudes.

Finding Solutions

The biomechanical tests showed that a successful material for the insole needed to be thick to combat the weight and pressure demands placed on it. The shoes, however, lacked the volume necessary to fit such a large insole. In fact, an early design made of silicone required 3.16" of material to provide the comfort and support necessary to make the shoes enjoyable to wear. Mrs. Brown went to the expense of having water filled insoles and air filled insoles developed, and even had a medical materials compounder develop a custom silicone blend for her insoles. None worked, because they leaked water or air, were too large for the shoe, or simply were too hard or too soft to provide comfort.

It was when Thany & Brown began working with a custom injection molding firm that recommended they give GLS materials a try. Because the insoles needed to be thin, yet very soft and gel-like without any air or nitrous oxide bubbles that could leak out, Brown opted to test some new ultra-soft TPE products from GLS.

Gel-licious Insoles

GLS Corporation, a leading TPE developer and innovator, stretched the boundaries of the product category a few years back by creating products that were so soft that they register as Shore 00, because they are nearly liquid. Offering benefits like water clear, gel-like softness with a warm tactile feel with high elongation characteristics, the VERSAFLEX® CL2003X grade materials are known for being the base material for products in the shoe, inserts, bike saddle, furniture padding and ergonomic grip categories. With a 30 Shore 00 value, the VERSAFLEX material offered the gel like properties that the PepnStep insole required, and did it in a thickness that met the need for a low volume shoe. Because it is clear, the insoles could be molded in a nearly invisible way, so only the most astute observer could detect that there was anything different a pair of heels that had the insoles in them. Most importantly, the CL2003 did not "deflate" under load, staying springy, soft and cushioning long after competing silicon products had given out even at just 1/8" in width.

Thany & Brown adopted an unusual yet highly practical test for the new insoles. Rather than going with a clinical test, they opted for a real-world "wear" test. Mrs. Brown challenged women to give the PepnStep product a try, and see for themselves the difference that a thin, 30 Shore 00 hardness insole could make on their feet after a long day in high heeled shoes. Brown herself pitted her prototyped silicone insole against the TPE offering, wearing one sole in either shoe and declared that the TPE insole was much more supportive and comfortable than her first efforts. In the wear test, many scoffed that the product would make any difference, as they were jaded by lesser efforts to solve the issue—but were amazed when the small, thin sole provided the right fit and low-volume comfort to make even the most high altitude heel much more appealing for all-day wear. The combination of the right material, the low volume insole, and the shape of the product encompassing the entire foot proved to buyers across the United States that the high heel could be comfortable, after all.

In working with GLS, Mrs. Brown found both companies easy to work with and extremely responsive to her unique needs. Additionally, it is a core value of Thany & Brown to retain all manufacturing and supply chains within the United States, and Brown has been very satisfied with GLS Corporation's ability to rapidly provide material solutions for her difficult application. The excellent quality of the materials has made the company ready for an initial product launch in the summer of 2004. They are priced at just $24.99 and come in self adhesive or tape-in options for medium to wide width shoes.

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 Rev. 101305