Just slip into something a little more comfortable

Fibre technology just won't stand still. Before you have had the chance to get used to one new fibre or technology, another one comes along. One of the problems tackled by many, with varying success, has been that of friction. Friction and chafing creates unwelcome discomfort and has long been associated with the formation of blisters. There is little doubt that soreness linked to some sporting or athletic endeavour can blunt enthusiasm.

In recent seasons, Friction Free Technologies, Inc., (previously PTFE Technologies Group) has been successfully addressing the problem. The earlier name of the New York-based development company provides the clue to how it tackles the matter of reducing friction. Using the technology associated with DuPont's Teflon, it has developed the means of combining PTFE (polytetrafluoro-ethylene) with other fibres for use with Blister Guard socks.

Friction Free Technologies has patented the technology for using Teflon fibre, claimed to be "the world's slipperiest substance", in fabrics so that the friction between skin and garment is reduced. (Wool has a friction coefficient of 0.9, nylon 0.54; by the time you reach Teflon, it has fallen to 0.04, and Teflon against Teflon, it's down to 0.006.) It also owns patents for the reduction of friction in apparel, accessories and equipment that come in contact with the body using other friction reducing fibres such as boron, graphite, silicon and Spectra.

During activity, friction occurs between the outer and inner layers of the skin. In the foot, for instance, the outer layer of skin is pressed down on the inner layer. At the same time, a lateral movement, or shear, of the two layers occurs when walking or running, tearing the tissue, which in turn forms the blister. By reducing friction, abrasion of the skin is diminished as well as the shear between the layers.

Blister Guard was first seen in socks but now the company, working with Hinda Miller (who created the original Jog Bra), and LaJean Lawson, an international authority on sports bra function and design, has developed the first 'friction free' sports bra.

Although the sports bra concept was developed over twenty years ago, recent studies in the US have shown that 50% of women report some breast/bra discomfort while exercising, some caused by the garment itself. Chafing, the result of abrasive fabrics and trims magnified by skin softened by perspiration, can result in painful irritations, bleeding and nipple burn. Comfort and performance are compromised.

The new Friction Free product promises to virtually eliminate the problems associated with undue friction by using the technology in abrasion susceptible areas of the bra. Initial tests indicate a reduction in friction of between 25-40% over conventional materials and it is expected that the technology will be made available to bra manufacturers. Other research is going on for application of the Friction Free name in shoe liners, gloves, cycling shorts, running vests, outdoor shirts for backpackers as well as underwear.

The key to the success of the technology is in keeping the Teflon fibre against the skin so that resistance as required between the outside of the sock, for example, and the shoe lining is maintained to prevent the foot slipping and sliding around inside the shoe.

Certainly the company has not been afraid to have its claims tested under the most extreme conditions. In September, it had a team of four runners in the Sabah 2000 Eco Challenge race, one of 76 teams which took part in the 300-mile race through the jungles of Borneo. It was the sixth race of its kind, described as a non stop, 24-hours a day, adventure race. The teams use only non-motorised transport such as canoes, kayaks, mountain bikes, white water rafts, horses, climbing ropes - and their feet. (Only teams that can work together and cross the finish line together are eligible to win.) The team came in 11th (only 44 teams finished). The heat, humidity and constant movement of the Eco Challenge racers greatly increased the danger of foot problems and most were forced to pay at least one visit to the Eco Challenge medical clinics during the race for emergency care. According to the race medical director, Team Friction Free's feet were in extraordinarily good shape and the four made it through without the usual painful blisters.

Keeping it natural

Cargill Dow, a 50:50 joint venture between Cargill Incorporated and The Dow Chemical Company, caused quite a stir when it announced that it had invented a new technology to produce performance polymers, suited to forming fibres, from totally natural and renewable sources. Driving past fields of sweet corn would no longer just conjure up images of food or Cary Grant trying to hide from a crop spraying plane in the memorable scene from a Hitchcock movie. Such fields could now set designers dreaming of fabrics with properties to match or exceed those of petroleum-based polyamides and polyesters.

There is something delightfully casual in the way the company describes its invention, brandnamed NatureWorks. "We start with



Slippery conditions make the Eco Challenge more hazardous but slip where it's needed helps members of Team Friction Free stay blister free.

natural sugars (derived from plants such as corn, wheat, beets and rice) and use fermentation to create lactic acid (a food additive) and some simple refining steps to create polylactide polymers (PLA). The result is the only commercially viable polymer to combine performance and cost competitiveness with outstanding environmental benefits," it claims.

And the word polylactide is set fair to enter the everyday vocabulary of textiles.

It won't be merely clothing manufacturers who will find themselves having to print new content labels for their clothing. The technology is likely to be used in injection stretch blown moulded bottles, food packaging which will be compostable, as well as water-based emulsions for paints, coatings and binders and a host of other applications.

Doubly natural

At October's Premiere Vision presentation in Paris, there were indications that the Woolmark Company was among those quick to see the advantage of working with Cargill Dow, finding a way of combining a natural product (wool) with another natural product, albeit tinged slightly with processing more akin to synthetic, which was not based on carbon or petrochemicals. For those with long memories, when the international wool symbol was first launched in the mid-20th century, all the marketing emphasis was on the purity of the fabrics produced solely from pure new wool. Much later, the people behind the wool logo realised that they would have to work with other man made fibre producers, but always with wool being the major partner. Only in the last two years has wool 'relented' when its research found that SportWool, with just 30% wool and 70% polyester, became an excellent performance fabric, especially for football shirts.

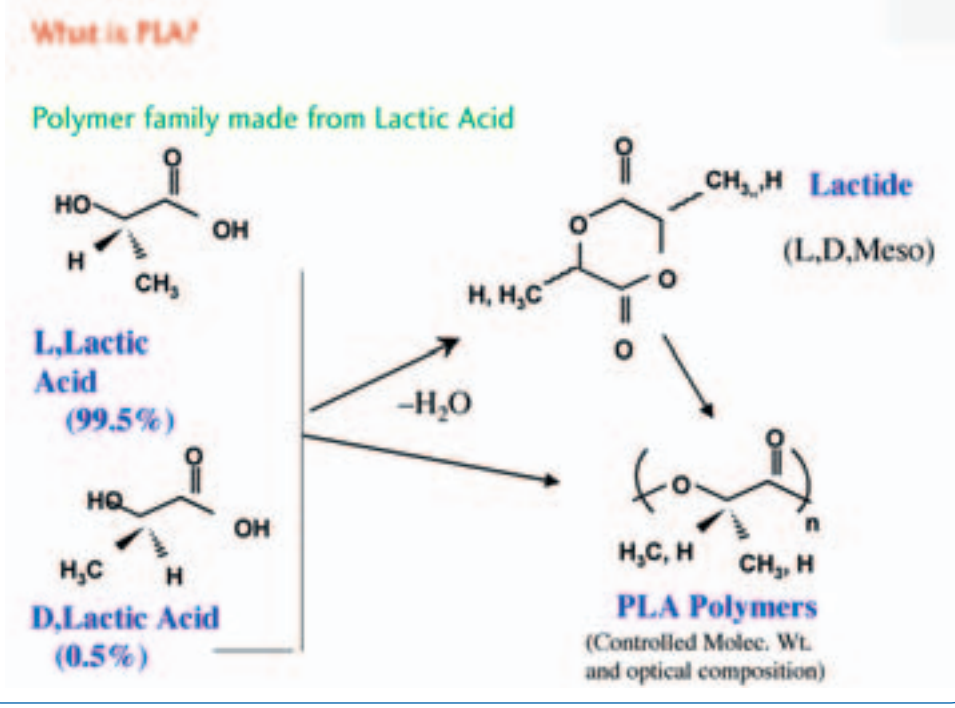
Now the Woolmark Company and Cargill Dow are working to explore the benefits of combining two natural based fibres – Merino wool and NatureWorks, described as the first material to allow production of fibres that successfully bridge the gap between natural and synthetics, and as such appears to offer the textile industry a new product option.

According to Andy Shafer, Commercial Director, Fibers at Cargill Dow, "We are excited about this relationship. The combination of two such unique natural/natural based fibres offers a wide range of added value opportunities and benefits to the consumer." Early development trial results are showing that there may be a number of processing efficiency benefits emerging from the natural blend combination. Indications suggest that new levels of performance may be possible in the areas of handle and crease resistance for smart casual products and moisture management advantages for outdoor wear.

Innovation

DuPont has introduced its Generation 1 Inova fabric range which utilises a multiplicity of DuPont technologies. Inova is essentially a new DuPont business concept, a joint venture in effect, which incorporates both its Lycra and non wovens businesses as partners. The unit is able to benefit from the cost advantage of non woven production and then add whatever technologies are required to achieve an apparel and high-performance fabric range. The unit is able to incorporate technologies from its other divisions such as paper and ink, Teflon, Thermolite, laminates, etc., but its starting point is combining the 40 years of textile expertise of Lycra with the unique attributes of non woven substrates. Material science is obviously the name of the game and allows the Inova team to cherry-pick across the DuPont spectrum to achieve the desired results.

David Buirski



Source: Cargill Dow