The Winter Olympics may often be overshadowed by their summer equivalent in terms of media coverage, but for fabric and clothing manufacturers – especially with the increasing popularity of winter sports in general – the competition to develop new technologies and higher levels of performance has never been so fierce. Whilst skiing receives a lot of publicity and the technologies used by top athletes have already filtered down to the High Street, little media attention is paid to the more specialised disciplines. This is a mistake, as there are some truly innovative developments being made to meet the specific requirements of these more 'obscure' sports such as the luge, skeleton and bobsleigh.

A sliding victory?

Skiing is without a doubt the 'star of the show' in terms of winter sports and the Winter Olympics, and this is not without reason as six of the fifteen disciplines at the XX Winter Olympics to be held in Torino (Turin), Italy in February will be skiing events. However, athletes will also contend medals in six other sports at the Games. The level of competition is higher than ever in these events and, in terms of functionality, it is fair to say that athletes in these disciplines often require a higher level of performance from their apparel and equipment. Winter athletes have to compete against the elements as well as their opponents and this means that competitors need all of the functional properties expected from performance apparel, but there is the added complication of keeping muscles warm in sub-zero temperatures while avoiding overheating, keeping clothing to the minimum in terms of bulk, protecting the athlete from injury, and improving speed and performance. This is no mean feat for apparel developers, especially in the development of bobsleigh gear.

The sport is divided into three events at the Olympics, the skeleton, two-man/woman and four-man competitions. According to the International Olympic Committee (IOC), each bobsleigh event consists of two runs in the women's competition and four in the men's and are timed to within 0.01 of a second to determine the winner, based on the fastest aggregate time from all of the runs. This is the official definition of the sport. To put it in the most basic terms: bobsleigh involves men and women launching themselves down a sheer ice run as fast as they possibly can! This poses a number of issues in terms of their apparel and has led to clothing manufacturers seeking inspiration from other, rather surprising, disciplines, some of which seem to have no connection at all to this rather unique sport.

Pooling its knowledge

The Speedo brand is recognised around the globe. Its name is synonymous with innovation in swimwear. There is such a level of brand awareness that - just as people refer to ballpoint pens as 'bics' and vacuum cleaners as 'hoovers' - it is not unusual for people to talk of their 'Speedos' when referring to their swimsuit. All very interesting, but swimwear has very little to do with winter sports and cold weather… or better put, it had very little to do with it, until now. Speedo has used its knowledge of the swimwear industry and adapted it to sledding sports. Having signed endorsement deals with several US bobsledders and skeleton athletes participating in Torino, Speedo has launched its Fastskin FSII ice suit. The athletes themselves helped to design the suit, which is said to be one of the most aerodynamically advanced suits ever produced – an all-important factor in a sport where speed is of the essence. "The difference between gold and silver at the Olympics will be hundredths of a second," comments Olympic gold medallist bobsledder Vonetta Flowers, who is one of the US athletes that Speedo is sponsoring in Torino.

The suit is made from Speedo's Fastskin fabric that was debuted at the 2004 Summer Olympics in its Fastskin swimsuit worn by stars such as Michael Phelps. Speedo has built on the research carried out in the development of this state-of-the-art swimsuit to create a product that is designed to meet the needs of athletes in the skeleton, bobsleigh and luge events. Based on sharkskin, it has the required aerodynamic properties to reduce drag; it has the biomechanical engineering needed to provide a tight "second skin" fit giving the athlete a greater feel for the sled and the run so they can make the slight adjustments required





Speedo's Fastskin FSII ice suit modelled by US skeleton athlete, Chris Soule.

Speedo

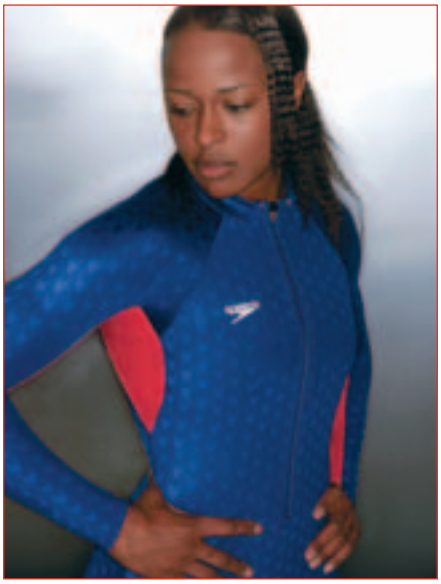
and eliminating almost all fabric vibration, gapping, and sagging; and it offers the freedom of movement needed when participating in these sports. In addition to this, Speedo has incorporated its new Flexskin fabric in key areas of the Fastskin FSII ice suit. This provides a greater range of motion for maximum push performance during the start phase of a race – this is particularly advantageous as the performance at the start of a run can determine the outcome of a competition. It also creates a compression effect, minimising muscle vibration to help muscles return to their original shape more quickly after contraction – even in cold climates – and it is designed to reduce energy dissipation, allowing the athlete's body to recover more quickly during and after a race.

As president of Speedo America, Sheree Watson comments,"…we applied what Speedo has learned through years of continuous innovation in the pool to the ice – opening up unprecedented opportunities for speed." And following extensive wind tunnel testing and evaluations carried out at Allied Aerospace in San Diego, USA, the response from athletes seems positive. Rather than being a fish out of water, it seems that the new Fastskin FSII ice is the next step in the evolution of sledding apparel.

Playing safe

Speed is vital in sledding disciplines, but protection is just as important in order to avoid injury. The human anatomy is not designed to protect itself against the impacts endured during the start phase of sledding sports. Athletes literally launch themselves into the run and this could lead to serious injury if they were not protected; but as freedom of movement is also an integral factor in terms of performance, apparel and fabric developers are constantly working on producing lightweight, tight-fitting clothing that can also offer the level of protection required. Japan's Wacoal Sports Science Corporation, part of the world's largest intimate apparel producer, is supplying Olympic luge athletes with its CW-X Performance Conditioning wear which has been designed to meet the wide range of requirements sledding demands. It provides protection, thermoregulation, moisture management, and support without impeding movement.

The patented CW-X Pro Conditioning apparel features a proprietary exoskeleton to support the major muscles and control mobility. The tops maintain posturing whilst the tights support the hamstrings



Olympic bobsledder Vonetta Flowers.
Speedo

(particularly during the 'pull' phase), the hip and lower back during the luge start and as the conditioning web extends from both sides of the hip to the lower back the athlete has more stability – around the pelvis area in particular. CW-X apparel is not only sport specific, it is also gender specific, so that the apparel is designed specifically to protect the male and female anatomy and optimise performance. One of the products that will be used by female sledders is a shimmel length sport support bra, which unlike other bras does not use compression to restrict movement or use underwiring as is found in conventional underwear. Instead it has CW-X mesh webbing built in to the cup of the bra to encapsulate the breasts. The web is designed in a five-point 'star' that covers the breast from the centre out, creating a floating inner support web that is comfortable yet supportive whilst not restricting movement. For sledders, this means that the breast is suspended from the shoulder strap and reduces upward bounce during impact. It also uses four-way stretch Coolmax to provide added motion control and to increase moisture management.

This means that movement is optimised and the athlete is protected from the impact, but in sledding – and other winter sports – the cold is also an important consideration. In response to this requirement, Wacoal recently launched its first line of insulated Conditioning wear, with Autosensor, a nanotechnology fabric with thermal, moisture wicking, temperature-regulating and antibacterial properties to optimise the comfort of the athlete.

Keeping a balance

Thermo regulation is not only important on the run, it is as important, if not more important, away from the action. Whilst sledding is an extremely fast sport, where speed is of the essence, the runs are over quickly and the sport involves a lot of hanging around. Whether in training or waiting to compete, athletes endure many hours of inactivity, but they need to remain comfortable and ready to compete. This means that athletes require cold weather apparel that keeps them warm in sub-zero temperatures, but maintains a comfortable temperature, so that they do not overheat when warming up. This has resulted in apparel manufacturers, such as Tog 24, which supplies the British luge team, investing more time into research and development in this area and has resulted in a breathable cold weather clothing kit. Tog 24 has added a Gore-Tex fabric to its products to produce apparel that offers comfort and protection.

It should come as no surprise that athletes who choose to take part in such a fast-paced and even dangerous sport in sub-zero temperatures require a high level of performance from their apparel. And fortunately, apparel manufacturers are investing in research to continually upgrade the level of protection and comfort provided. Bobsleigh may be fairly low profile in terms of media coverage, but in terms of apparel development it is thankfully receiving a great deal of attention.

Origins of Bobsleigh

Often perceived as a fairly 'new' sport, the bobsleigh actually has a very long heritage and has featured in the Winter Olympics since the Games inception. The skeleton is widely regarded as the original sledding sport, although it has changed greatly over the years. It is believed to have originated in St. Moritz, Switzerland, in the late 19th Century, with the first competition dating back to 1884. Participants in the sport originally sat in more traditional sledding position and the prone position (where the athlete lies on their stomach) was first adopted in 1887. The name originates from the metal frame used to travel down the run which was introduced in 1892 and was thought to resemble a skeleton.