A new twist on wool

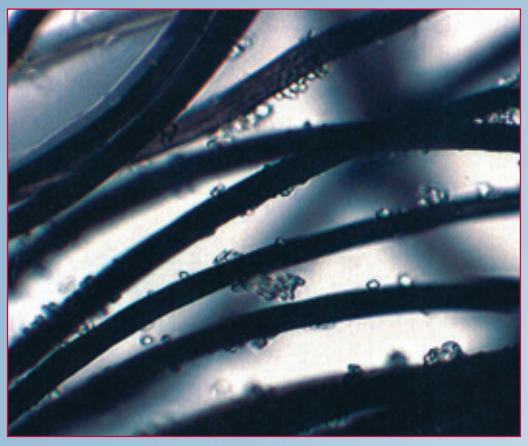
Whilst wool may be a natural choice—thanks to its inherent moisture management, antimicrobial and fire resistant properties—it has not always received good press, due to the dreaded 'itch' that is sometimes associated with woollen garments. However, our ancestors who discovered wool as far back as 4,000 BC, and in fact anyone who was forced to wear scratchy pullovers knitted by their grandmothers as a child, would not even recognise the fine, itch-free wool now available in the 21st century. Thanks to the increased use of soft Merino from Australia and New Zealand and recently developed woollen fabrics and apparel which add a new twist to this natural yarn, wool has moved into a whole new category up alongside the most technical of fibres. This change in direction was highlighted when no fewer than 17 high performance Australian Merino products were presented alongside other cutting edge sporting goods at ispo in February.

Having only attended ispo for the first time in 2006, Australian Wool Innovation (AWI)—a public, not-for-profit company which represents Australian woolgrowers—presented a wide collection of Merino products in February, ranging from extreme protective textiles, multi-climate buffering fabrics, and sample design products all developed specifically for extreme sports and including some of the latest textile technologies such as new colour techniques, reduced air permeability, increased strength, feather-weight textiles, and stain resistant, quick dry, flexible and comfortable next-to-skin products.

New Merino technologies presented by AWI included Quick Dry Merino that washes 'drier' and has improved stain resistance, thus eliminating the 'nasty' odour that was traditionally associated with wet wool; Merino Antistatic, a new generation of wool fibres that prevent electrostatic charges accumulating and shield the body from harmful electromagnetic waves whilst also providing sensing properties to various stimuli and harmful chemicals; Merino WWB, waterproof, windproof, breathable (WWB) Australian Merino outdoor wool garments, designed to protect against extreme

Members of The Wild Oats crew, who competed in the 628 nautical mile Sydney to Hobart yacht race, wore DrizaBone's new Merino base layers and polo shirts.

Drizabone



AWI worked with Klimeo to develop Merino fabrics coated with microcapsules of synthetic phase change material.

Klimeo

weather by incorporating New Zealand-based Canesis' Keratec technology; Merino with Cognis' Skintex insect repellent; and Merino Fresh with Korean NP-Tech's Nano Tech AB which inhibits bacterial growth and keeps Merino garments fresher for longer.

AWI has also worked with other well-known brands to improve on the already significant properties of Australian Merino. Although the naturally occurring thermal regulating properties of Merino wool are well-documented AWI has improved this characteristic through a series of collaborations with well-known brands that produce different thermal regulating technologies. AWI worked with Klimeo to develop Merino fabrics coated with microcapsules of synthetic Klimeo phase change material that cool the wearer down when the temperature rises, but keep the wearer warm in colder conditions by absorbing, storing and releasing heat through changing from a solid to a liquid form and vice versa, depending on the body's temperature.

A natural balance

Another thermal regulating technology in Merino was recently launched by AdvanSA and Invista, which showcased their new innovation, Coolmax with Merino wool at Pitti Filati in Italy at the beginning of February and at ispo later in the month. The new technology was made possible with AdvanSA's development of a brand new polyester staple fibre in lengths that are compatible with traditional woollen fibres. Italian spinner Grignasco and German spinner Stöhr then developed yarns with Australian Merino wool, to combine the natural properties of Australian Merino—including breathability, comfort and softness—with the performance attributes of Coolmax to produce garments that provide comfort, moisture management and temperature regulation. The soft and lightweight fabrics made from wool with Coolmax are also machine-washable making them well-suited to sports and outdoor base layers and outerwear. Combining natural Merino wool fibres with man-made technology, this new development has not only broadened the application possibilities of Coolmax, it has also expanded the seasonality of wool garments by providing the technology to extend wool's applications into spring and summer apparel.

AWI also collaborated with Invista to develop other new products—Merino with Thermolite, Merino with Teflon and Merino with Lycra. Merino with Thermolite is designed to produce outdoor sportswear that protects against extreme cold and allows more freedom of movement by using a lighter weight fabric than traditional cold weather gear. As with Merino and Coolmax, Invista's technology can be applied prior to spinning or as an end-on-end yarn in twisting or fabric plaiting during the knitting process to produce lightweight, machine-washable fabrics that offer a high level of protection for intimate apparel and base layers to outer wear. In AWI's 'protect' products Teflon is added to the Merino during the fabric finishing process to produce machine-washable sportswear and outdoor gear with superior stain release and water repellency. Merino with Lycra provides stretch and shape retention thanks to the integration of Invista's Lycra as well as offering compression support and comfort making it suitable for a wide range of performance apparel.

Combining these new technologies with Merino's inherent characteristics has catapulted wool into the upper echelons of performance fibres, opening up new markets to wool producers and garment manufacturers as well as widening the opportunities for existing sports

Australian Merino combined with the performance attributes of Coolmax has produced garments that provide comfort, moisture management and temperature regulation.

AdvanSa

apparel brands. "Performance is a huge arena for Australian Merino wool. AWI's direct business relationships with textile technology centres, manufacturers and designers have led to extremely innovative products that capitalise and heighten the extreme performance benefits that Merino provides naturally," says Mark Brooks, product development manager Outdoor Wear at AWI. One company to have done just that is Australian brand Driza-Bone, which exhibited its new Merino collection at ispo.

Plain sailing

Driza-Bone worked with AWI and The Merino Company in Australia to create what it calls a 'second generation' range of outdoor active apparel for men and women, made from 100% Merino wool. The 12-style collection, constructed from a 28 gauge single Australian Merino wool jersey and a 28 gauge interlock fabric, is designed to keep the wearer comfortable and dry from the inside out by exploiting the inherent stretch, UV protection, anti-odour and breathability properties of Merino wool to offer improved performance over synthetic alternatives.

The importance of Merino in the development of Driza-Bone's new collection should not be understated as, as although the company was established some 108 years ago, this new range marks its first foray into base layers and next-to-skin garments, thus illustrating the advances that have been made in wool fabrics in recent years. Prior to this collection Driza-Bone was better known for its oil skin coats designed for sailors, but now sees the Merino base layers as the perfect complement to its traditional products. Speaking to WSA, CEO of Driza-Bone, Rod Williams, enthused, "After 100 years of keeping our customers dry outside now we can keep them dry inside." And it appears that the company has every right to be proud as the products have proved popular in the extreme field tests carried out by top sports people including the Wild Oats crew who competed in the Sydney to Hobart yacht race and extreme ski schools in both the USA and Europe. Australian cricketer Brett Lee and Australian rugby captain George Gregan are also both members of Driza-Bone's 'Opinion Leader Network' that has tested the garments.

Going 'au naturel'

The improvements made in wool in recent years, and the increased popularity of the fibre, have inspired other companies that traditionally focused on more synthetic materials to turn their attention to wool.

Well-known for its high tech textiles, Switzerland's Schoeller Textil AG has gone back to nature, combining its innovative technologies with wool in its autumn/winter 2007/2008 collection. This has come about as a result of the progress made in eliminating the negative characteristics associated with wool in the past, such as shrinkage during laundering and the infamous 'itch'. Exploiting wool's inherent performance properties, Schoeller has now added further functionality and technology through combining wool with its advanced finishing solutions to meet the growing consumer demand for natural, sustainable performance fabrics. By combining Schoeller's bionic c_change membrane with wool the company can offer weather protection with flexible breathability, whilst wool with NanoSphere achieves an improved level of water and dirt repellence and with the addition of Schoeller's silver ion-based finish it can also offer increased anti-microbial protection.

Schoeller has combined its innovative technologies with natural wool for its autumn/winter 2007/2008 collection.

Schoeller Textil AG

Another name that is not usually associated with wool is Gore-Tex, but thanks to a collaboration with W.L. Gore, Norwegian knitwear specialist Dale of Norway has launched Knitshell for outerwear—a combination of Dale of Norway's proprietary water resistant yarn and a new technology that allows traditional Gore-Tex Windstopper membrane to be adapted to wool. The result is said to be a comfortable and breathable garment that repels water and offers complete protection against the wind.

The procedure consists of producing large quantities of wool whose fibres have been pre-treated to repel water and dirt. The wool is then knitted and cut using digital technology and fused, piece by piece, to the new membrane developed by Gore. Comfort is then maximised through the addition of a flannel

Dale of Norway has launched Knitshell for outerwear—a harmonious combination of its proprietary water resistant yarn and a new technology that allows traditional Gore-Tex Windstopper membrane to be adapted to wool.

Dale of Norway

inner lining on the interior of the garment and stretch side panels featuring Taifun 200 3L Windstopper membrane.

Having collaborated with Gore for a number of years, Dale of Norway had already introduced a collection of Windstopper membrane-lined sweaters which have proved popular in Europe and the company hopes that the new Knitshell outerwear collection will enjoy equal success.

In the new collection, Dale of Norway offers a women's and a men's Knitshell collection in a variety of jacket styles with features such as four-way stretch panels, inner and outer pockets, and detachable adjustable hoods. They are all fully water resistant, windproof and highly breathable.

Even the most high-tech producers are now realising the benefits of including natural fibres into their product ranges. Nanotechnology innovator Nanohorizons Inc. recently launched its SmartSilver permanent anti-odour /antimicrobial technology for 100% wool to its line of SmartSilver for polyester, nylon, polypropylene, cotton and rayon. Having overcome the problems traditionally associated with applying anti-bacterial finishes to wool due to its naturally high oil content, the technique employs nanotechnology to impart permanent anti-odour performance to wool using typical fabric and garment dye systems.

The advances made in wool's performance do not only increase the comfort of garments, they have also led to potentially life-saving developments. The USA's Agricultural Research Service (ARS) recently discovered a new heat-resistant, material, which can be applied within the fabric structure of wool to improve its inherent flame resistant properties in order to prevent it from burning. The new development provides much needed protection for servicemen, who have suffered horrific burns in the past from wearing synthetic polyester materials which melt when subjected to extreme heat or flames.

ARS is currently looking to license the new technology, which can be applied to yarn, fabric and finished garments and can also impart heat-resistance to existing textile clothing and material lines such as children's clothing, sleepwear and workwear, as well as military apparel.

Furthermore, the material is not only technically advanced it is also more environmentally-friendly than previous fire resistant treatments that often used metallic materials and chemicals. ARS's technology uses a polymer applied with additives that are non-hazardous and can be added using a water solution in textile mills during the wet finishing process, either before or after finishing with existing mill equipment.

The developments made in improving the performance of wool are beneficial to all. Evermore comfortable garments are available to consumers, fabric developers can incorporate technology into natural fibres as well as synthetics thus broadening their markets and the environment benefits from the use of more sustainable materials and processes. As a result of these advances, whilst the lambs may be gambolling in fields around the world this spring, wool's position amongst the most technical of fibres is surely a safe bet for the foreseeable future.