

Ultra-light insulating jackets, like this model designed by Killer Loop using PrimaLoft One, were among the spring-summer 2014 highlights seen at the 2013 OutDoor show in Friedrichshafen.

Killer Loop

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From ultra-slim summer insulation and far-infrared reflecting materials to patterned trimming, new textiles pack multiple features in ever more compact formats for innovative sportswear designs.

Bridging the gap between performance and aesthetics

Textile manufacturers continue to explore innovative ways to provide multiple features in a single and, when possible. finer layer. This multifunctional momentum, which is found throughout the textile chain, starts upstream with a series of recently formed partnerships between chemicals companies and fibre producers.

A start-up in the field of high-tech finishes, Swiss specialty chemicals company HeiQ has recently formed partnerships with two long-established companies: German chemicals specialist Rudolf Chemie now markets the durable water-repellent finish Barrier, developed by HeiQ, and Swiss masterbatch specialist Sukano now offers HeiQ's antibacterial finish Pure. In the latter case, HeiQ is in charge of development and Sukano manages sales, says Robert Schroots, Sukano's market development manager. "Compared to other antimicrobial finishes, it is possible to achieve brighter white shades with Pure, an important feature for a hygienic finish," he says.

In a move to develop worldwide sales of Emana polyamide, Rhodia Brasil, a division of Belgian chemicals conglomerate Solvay, has partnered with Italian polyamide specialist Fulgar, which is now in charge of selling the energy-boosting polyamide in Europe. Emana joins Fulgar's current branded offering that includes Q-nova, a recycled polyamide, and Q-skin, a silver-based bacteriostatic polyamide microfibre. "For sportswear end-uses, in addition to the intrinsic moisture management properties of polyamide, Emana's far-infrared reflecting bioactive minerals improve microcirculation and cellular metabolism," says Elizabeth Haidar, new business director at Rhodia Fibras Brasil. These properties have been tested in more than 15 clinical trials, she says, while admitting that the biggest challenge is still "convincing consumers".

A boost in energising fabrics

Celliant is another far-infrared reflecting (FIR) material seeking to expand its business in Europe. The California-based company, formerly known as Holofiber, has been working with Italian insulation specialist Imbotex for bedding and is now looking to develop sales in sports apparel. Down feathers coated with Celliant, a product co-developed with Imbotex, offer "up to a 10°C difference in thermal insulation," says Alexander Foyle, Celliant's managing director for Europe.

Celliant fibres and yarns (all produced in the US) are based on polyester combined with 13 "optically responsive minerals" that are said to have high absorbency and light-reflecting properties. The minerals are ground to a fine powder and added to the polyester polymer during extrusion in a core-sheath construction.

"On average, a human body emits 100 watts of energy that are absorbed and modified by the minerals resulting in increased oxygen in skin tissue," says Mr Foyle. This property is measured by a transcutaneous oxygen pressure device (TCOP2), which calculates oxygen content by measuring light absorption. Wearing a garment with Celliant (the company recommends a minimum content of 42%) is said to accelerate blood circulation with associated benefits, such as reduced lactate emissions. "It's not a miracle effect, but rather a mild one, something comparable to light therapy," says Mr Foyle, adding that Celliant's effect will be all the more perceptive if the garment is worn all day long. The company claims to invest $100,000 per year in clinical studies. Adidas has introduced Celliant in golf shirts, Reebok uses the yarn in its Zigtech branded apparel

A2B is a new range developed by Arc'teryx for urban bike commuters. The jackets and pants (the women's pants were awarded a prize at OutDoor) combine reflective elements and ergonomic fits.

Arc'teryx



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and Puma has also adopted the concept for a running wear collection designed for Usain Bolt.

In France, HT Concept continues to develop new references in its Gold Reflect'Line range of far-infrared reflecting membranes, coatings and prints. For summer collections, the company prints the ceramic additive on boardshorts fabrics, promoting them as a way to "reduce seasickness", says Thierry Heim, head of HT Concept. A new study has been launched to evaluate the pain-alleviating effect of the ceramic additive. "We are looking to see if the material has an effect on people suffering from moderate but chronic lower-back pain," says Mr Heim.

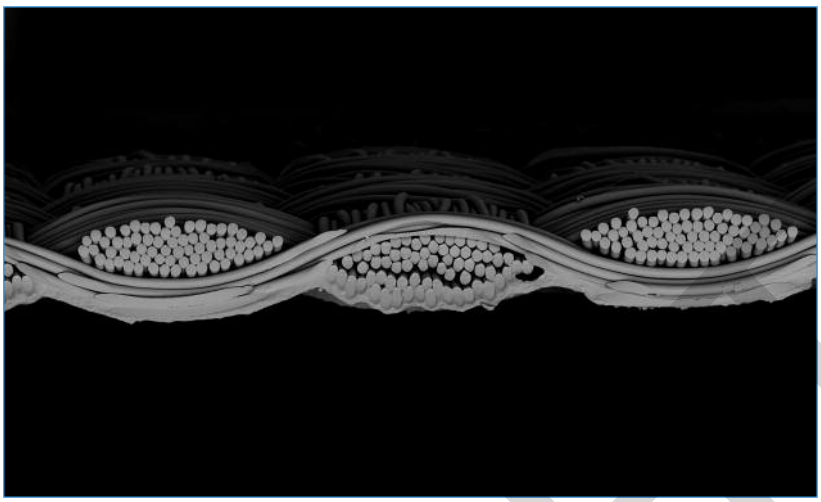
Italian knitter Piave Maitex has also introduced FIR fabrics for compression wear by pairing Emana polyamide with high elastane content (25%). "The far-infrared effect speeds up the muscle warming process, helps muscles consume less oxygen, and is particularly beneficial if the garment covers a large surface," says Enrico Serafini, Piave Maitex's export director. The company has developed a range of four fabrics from 110 to 210 grammes per square-metre.

Italian fleece and laminate specialist Frati has also introduced a FIR reference made with Resistex bioceramic polyester yarns in a fabric that is brushed on one side for use as a lining. At HT Concept, ceramic-based FIR prints on the back of soft-shell fabrics are designed to boost the thermal insulation of the versatile outerwear multiple-layer fabric.

Riedel Textil, a German knitter, has been working on a high-performance garment concept for the past 18 months called Kinesiowear. Available in three styles (above knee shorts, below knee shorts and ankle length suits), the garments combine 18 different knit structures applied in a body-mapping construction and designed to reduce muscle rotation and vibration during movement. "We have looked to apply the massage effect of kinesio tapes via raised textures on the back of the fabric," says Riedel Textil seamless product manager Frank Drechsel. The concept is being tested by a laboratory at Cologne University in its current composition (47% polyester, 20% polyamide and 25% elastane), and Riedel plans to introduce wool blends for winter.

Lighter and stronger

Lightweight thermal jackets were one of the highlights of the 2013 Outdoor show held in Friedrichshafen in July. This new garment category makes use of PrimaLoft's lighter references, including PrimaLoft One, featured in Killer Loop's collection; PrimaLoft Eco, used by Vaude; and PrimaLoft Sport, chosen by Norrona. The material's packability, resilience, water resistance and fast drying properties have been found useful in sleeping bags, with three new brands proposing PrimaLoft bags: Mountain Equipment, Salewa and Montane, the latter using a mix of 70% recycled and 30% virgin fibre (PrimaLoft Eco). PrimaLoft is preparing to launch a new product at ispo in January 2014.



Made in Invista's high-tenacity Type 749 nylon 6,6 air bag technology fibres, Cordura Lite Plus fabrics are available in 210, 315, 420 and 525 denier offerings. Compared to the current Type 725 Lite range, this new development boasts twice the filament density and their lower denier per filament count results in a smoother hand feel.

Invista Cordura

US-based Cocona has recently developed a padding using the eco-fibre derived from coconut shells, which means the performance concept now covers all apparel needs from fibre, to membrane to filler, says Edouard Liffran, in charge of sales for France. With the recent arrival of Jeff Bowman (formerly at Malden Mills) as CEO, Cocona is preparing a global relaunch later this year.

Solar+, a new development at Swiss company Schoeller, is also designed to offer



The lightweight Freney jacket from Vaude contains 40 grammes of PrimaLoft Eco fill.

Vaude

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(Left) Crinkle is one of a series of new stretch retroreflective fabrics with embossed patterns developed by JRC-Reflex.

(Right) French company U-CLife (for Up-Cycled Limited Impact Fabrics Experts) buys used garments which it then sorts, cuts and reassembles by material (leather, denim, wool, cotton) and colour.

JRC-Reflex / U-CLIFE

warmth without bulk. The new finish absorbs heat emitted by the sun to keep the body warm. The patent-pending finish is being presented as the winter equivalent of ColdBlack, a finish that reduces the light-absorbing properties of dark-coloured textiles to keep the body cool in warm weather.

In another lighter yet stronger development, Invista's new Cordura Lite Plus Fabric transposes a process developed for airbags to luggage and backpacks. "The fabric is stronger yet lighter, offering improved tensile strength by 12% to 40% depending on references," says Cindy McNaull, Invista brand manager for Cordura, noting that the first fabric developments are already available for spring-summer 2014.

High abrasion resistance is also coming to traditional denims thanks to new developments at Artistic Denim Mills. The Pakistan-based company is exploring new blends including Cordura with para-aramid for a "ballistic" denim made for motorcyclists and Tough Max Lycra denims that offer "a more robust form of elasticity," says Jean Hegedus, global denim manager for Lycra at Invista. Two new mills are introducing Cordura-Lycra denims: "Yanji in China has developed a stretch Cordura denim with Lycra T400 offering enhanced moisture management and Advance Denim Hong Kong is now making Cordura denims for women's wear using Lycra DualFX, which is engineered to withstand extreme garment finishing," Ms McNaull says.

New developments in merino wool

Wool continues to draw great attention in active sportswear, inspiring many new developments seen at the Performance Days show in Munich in May. A knit combining ThermoCool for thermoregulation and evaporative cooling with the comfort and natural feel of merino wool was awarded first prize in the Active & Workwear category of the Performance Days Awards. The fabric, called Ferntree, is knitted with a yarn spun by Südwolle combining wool with Advansa's polyester ThermoCool. "This type of blend is naturally easy-care and does not require an additional chemical finish, which is better for the environment," says Elke Lamberts-Steffe, Advansa's Technical Development manager for branded apparel. "Fabrics that are 100% wool can become saturated with humidity, which is not too pleasant on the skin, and this is why wool-polyester blends are a better option for high-intensity sports," says Ms Lamberts-Steffe, adding that a fabric may contain only 30% wool



In addition to the new ThermoCool with merino wool blend, which improves on the natural fibre's moisture management properties, Advansa is also introducing ThermoCool Eco2 blends with organic cotton grown in Egypt for spring-summer 2014.

Advansa

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yet will still "have a nice wool hand feel."

Danish company Thygesen + Birk, a new exhibitor at Performance Days, showcased both high-performance and urban merino wool references at the event. The company was formed in 2010, when Thygesen and Birk, two long-established knitters, merged their knitting (a total of approximately 100 knitting machines), cutting and sewing facilities. Thygesen + Birk develops Woolmark's SportWool branded fabrics for first layer knits in either pure merino or merino/polyester blends. Polyester and wool fleece sweatshirt fabrics are made with 19.5 micron count merino yarns, while first layer knits use the finer 17.5 micron yarns. The company's spacer knits, also available in wool blends with polyester, are made on circular knitting machines, which gives them high elasticity, a property rarely found in warp-knitted spacer fabrics. The company's high-stretch knits with wool are designed for compression apparel, while the double-face jacquard motif knits in pure wool target urban and streetwear uses.

Creative trimming

Since April of 2013, Scandinavian company Sto-Nor has introduced a new brand name, Loxy to boost its global business. The company offers a wide array of taping solutions from retroreflective trims to seam-sealing tapes. "The sports and outdoor market is growing and we intend to promote Loxy in these markets," says the company's sales manager, Michael Hansson. Sto-Nor develops seam-sealing tapes in five thicknesses, from 50 to 250 microns (in 50-micron stages). The company is proud to have a thriving market in China, where the Swedish-made seam-sealers have carved out their own niche. "Polyurethane is very sensitive to humidity; to obtain a homogenous thickness, especially in ultra fine references, factories in China must invest in advanced air conditioning systems. Our products, made in the relatively dry climate of Sweden, are then considered reasonably priced. Additionally, our products are shipped in the many empty containers that head back to the Far East after having delivered their goods to Europe," says Mr Hansson.

Ultra fine tapes, designed to be invisible in a finished garment, are part of the general move towards finer seamless styles. This is an area in which French company Seripress has developed a unique heat transfer technology by which high-definition graphics, marking and labelling are bonded to the fabric. "Our process is fast, the graphics are set in four seconds, and the inks are water-based," says Daphné Thomas, a sales manager at Seripress. In testing conducted by the company, the graphics withstand 40 washes at 60°C.

Retro-reflective specialist JRC has been experimenting with embossing its microsphere embedded fabrics and trims and is currently introducing a whole new series of patterns. Dotted, striped and crinkle motifs embedded in the retroreflective fabric create novel yet subtle graphic effects.

To finish this round up of new fabric developments with an eye on environmental matters, a French company called U-CLife, which stands for Up-Cycled Limited Impact Fabrics Experts, pieces together fabric patches cut out of used garments. U-CLife wants to simplify recycling for brands by selling the resulting fabric by the metre in matching colour schemes. This is yet another example of the seemingly unlimited creativity and inventiveness at work in the textile industry.



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