

PERFORMANCE DAYS FOCUS TOPIC CONTENT

Evolution and Revolution: From Membranes to the Carbon Story

In recent times, changes in our world have become more noticeable, partly due to increased communication channels. The pace of change seems to be speeding up. The two iconic products in the Outdoor & Sports Industries, the waterproof breathable jacket and the fleece, are currently undergoing significant transformations, largely due to impending legislation.

These times of dynamic change have raised a fundamental question: Is it better to evolve or revolutionize? Evolution involves improving existing products without significant changes, while revolution entails almost creating entirely new categories.

Evolution is the cornerstone of this industry. Materials are constantly being enhanced, whether through advanced yarn engineering to create lighter and stronger versions, adopting different manufacturing techniques to reduce environmental impacts, or using more eco-friendly chemical dyeing and finishes. Revolution often makes headlines but may not be immediately evident in the fabrics themselves. It includes subtle changes like introducing biodegradable initiators, carbon capture yarns, new Ingredient sources, and similar innovations.

Revolution disrupts the market and, while it garners attention, it often necessitates re-education. Companies with larger marketing budgets may tout evolutionary developments as revolutionary, leading to cynicism.

The two iconic products mentioned earlier were revolutionary, and their creators reaped ongoing success. Brands that dare to innovate often succeed, but there are also failures and false hopes. Those who engineer new products tend to fare better than those relying solely on marketing budgets.

As much of the industry revolves around product development, changes in this area impact consumers. Ingredient Sourcing is a crucial focus, and there is growing pressure to improve responsible practices and reduce environmental footprints. Fabrics are a low-hanging fruit, enabling design teams to minimize the industry's negative environmental impact. Some brands are exploring profit avenues beyond simply selling more products, focusing on servicing existing items. Moves away from the continual churn of product are being explored.

A way to achieve this is through the Circular Economy mantra, based on three core principles:

1. Eliminate Waste and Toxins
2. Extend the Product's Usable Life
3. Regenerate Nature and Systems

In detail, this means using recycled content fabrics, and removing harmful substances. Professional cleaning, revitalization, resizing and repair services, before the items get put into channels that allowed reduced consumption, all ahead of textile recycling & decomposition options. Plus striving to align the newer business systems with nature and social responsibilities.

The recent theme of our shows has been carbon footprint assessment, reflecting the industry's increasing focus on reducing carbon emissions, a major contributor to climate change. Recent wildfires & flooding worldwide highlight the urgency of addressing this issue – these conditions are no longer exception or occasional.

PERFORMANCE DAYS and the Functional Fabric Fair powered by PERFORMANCE DAYS have played a significant role in educating the textile industry about environmental impact assessment scales. In Europe, the EU Green Deal is incorporating Product Environmental Footprints, while the Higg Index is gaining momentum globally.

While carbon reduction is vital, there are 12 other areas of the Corporate Social Responsibility focus including biodiversity loss, ecotoxicity, resource scarcity, eutrophication, air pollutants, water crisis, inequality, health, overconsumption, poverty, education, affordable goods and services.

In addition to the Fabric Forum, the Footwear Area has expanded, the Innovation Zone highlights revolutionary developments, and the Sustainability Area, by GreenroomVoice, addresses ongoing CSR issues.

The focus on membranes, prompted by changes in regulations of manufacturing practices, will lead to advancements in waterproof breathable materials. The shift towards sustainability will also affect insulation materials. Playback the Pecha Kucha presentations from the last show (via our website) to reveal the amount of change in this category.

The attention is on membranes right now. The pressure from the Zero Discharge of Hazardous Chemicals to not endorse those manufacturing using Forever Chemicals in the process has meant a move away from PTFE – the main Microporous substrate. At the same time there has been a reassessment of Hydrophilic membranes as they have been fine tuned to better performance. Meanwhile Electro spun solutions have been able to eliminate PFCs from their process and PU membranes made without solvents are appearing on the market.

The basic breakdown of the main options are: membrane or coating – the former is more durable, better performance, but higher cost. Next level down is Microporous, Hydrophilic, Electro spun, & then the PU membrane. This overlooks whether a waterproof system is required in the first place: a suitable fabric can withstand the conditions without the barrier layer (which will always restrict the permeability); a quarter of a century ago a Windproof shell was a popular part of the attire. In the Focus Topic category there were 19 different options of solutions: 2-layer, 3 layer, solvent free, BioBased, Carbon Capture yarn, recycled yarn – applied to the 4 different membrane options. All used C0 DWRs. The Jury did not consider durable water resistant finishes, but the Innovation Zone has a stain resistant DWR option...

What was also appreciated is that there is NOT one scale that can be used to measure breathability. Whereas specialists in the industry can compare both JIS scales & DMPC – these are not the industry norm. Our public are just confused & chose the easiest set of numbers without getting the system which would be best for them. If the ISO for waterproofing is just 1000mm (allow 5k for pressurized areas), plus that ALL membranes lose performance with contamination from use (even fog &

smoke have an effect) – how much above 10k hydrostatic head is required? There is direct correlation between increasing the waterproofness & the decrease in breathability.

Our view is this is a muddled area; technology is still progressing to produce better solution; more attention needs to be applied to the choice of system – the protection required for big wall climbing is not the same as that for hiking. Worth noting is that dog-walkers are generally the best gear testers for shells.

Different membranes breath in a different way – the measurements are of what comes through the system as opposed to what is taken away from the wearer: microporous has great results from the start; hydrophilic has a slow start, but does not lose so much of the permeability when the outer fabric is wetted out; Electro spun is more towards the higher breathability, but lower hydrostatic head end of the scale; whilst PU delivers the cheapest cost, but has the highest solvent component.

On the iconic product of the Outdoor & Sports industry there is too much confusion associated. **In a world where clarity is required – the industry does not deliver!** The brand that is most commonly associated with this segment is no longer a dominant solution but retains popular appeal. In other words – expect even more disruption...

The other side of the Focus Topic is the Carbon Story with an increase in 'natural' yarns from ReGenerative Agriculture, and more Carbon Capture & Utilization fibres (where sequestered carbon is used as the basis for newer synthetic materials). Attention needs to be on the various auditing bodies that certify the provenance of the sequestration.

The other new section to the show is the greater attention around Footwear – which has its own Footwear Forum. This section contains developments in production techniques, testing capacities, as well as fabrics. The biggest talking point is around pLeather (e.g. Vegan Leather). There is progress here, but the alternatives are still not in the same league as real leather (a waste product from the meat industry) in terms of durability, permeability, & recyclability. Most of the samples have a majority synthetic binder. This stated: it is going in the right direction & perhaps mycelium is showing the most promise.

The Outdoor & Sports industry has often led the way in setting standards for other industries to follow. Increased social issue awareness has led to better practices, improved environmental measurement has meant less bad product, and business development that benefits all society. We should take pride in the positive impact of our industry on individuals and society, recognizing that more can still be done. While the desire for constant reinvention persists, much of the industry's progress has been evolutionary. Yet, it has championed innovations like permeable waterproof membranes and fleece mid-layers, which did not exist half a century ago.