TexSPACE Today
SUSTAINABILITY - PRECISION - AUTOMATION - CIRCULARITY - ENERGY
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Sensor Technologies of Yarn Manufacturing for Intelligent Spinning

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Content

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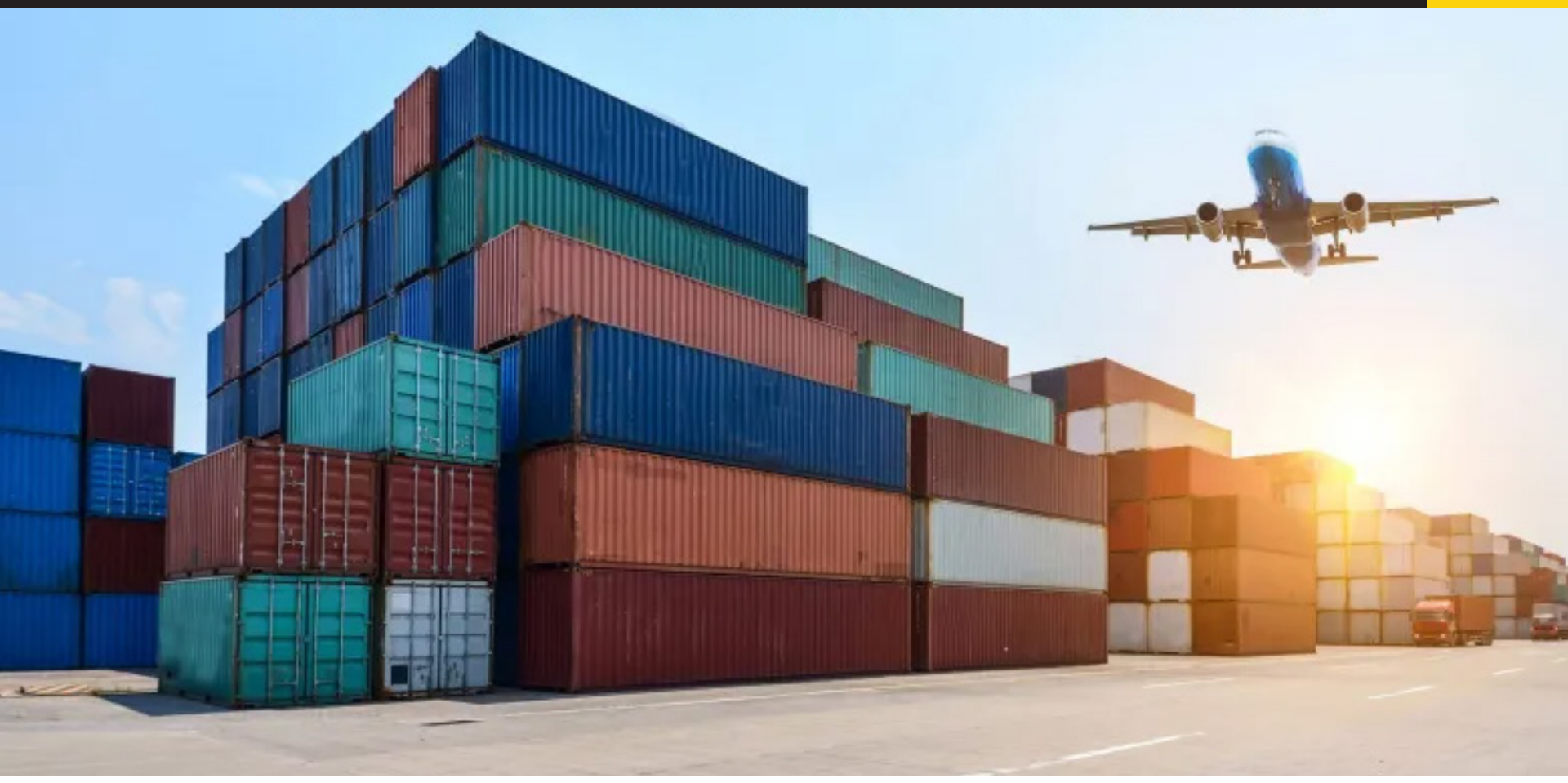


Weaving Up, Spinning Down – ITMF reports shows contrasting global trends

Harry White

The global textile machinery market experienced mixed outcomes in 2024, according to the 47th annual International Textile Machinery Shipment Statistics (ITMSS), released by the International Textile Manufacturers Federation (ITMF). The report, compiled with data from over 200 manufacturers, offers comprehensive insights into six key segments: spinning, draw-texturing, weaving, large circular knitting, flat knitting, and finishing.

Spinning Machinery: Sharp Declines in Short-Staple and Open-End Rotor Shipments

Global shipments of short-staple spindles fell by 40% year-on-year, reaching 5.92 million units a reduction of 3.8 million units from 2023. Asia & Oceania, accounting for 90% of these deliveries, experienced a 36% decline. Other regions saw even steeper drops: Africa (-64%), Europe including Türkiye (-56%), and North and Central America (-90%). In contrast, South America and Eastern Europe recorded slight increases of +1.7% and +12%, respectively. Leading investors included

China, India, Türkiye, Bangladesh, Egypt, and Indonesia.

Open-end rotor shipments also declined, dropping by 39% to 623 thousand units, 390 thousand fewer than in 2023. Asia & Oceania received 89% of global shipments, with China, India, and Türkiye leading investment despite decreases of -32%, -57%, and -56%, respectively. Notably, Vietnam and Bangladesh bucked the trend with shipment increases of +214% and +44%.

Conversely, long-staple (wool) spindle shipments surged by 62%, reaching 600 thousand units. This growth was primarily driven by Asia & Oceania and Eastern Europe, which received 138 and 15 thousand units, respectively. Iran (40%), China (30%), and Vietnam (13%) were the major destinations.

Texturing Machinery: Strong Double-Digit Grow

The draw-texturing segment saw significant expansion in 2024. Single heater spindles, mainly for polyamide filaments, increased by 95% from 43 thousand in 2023 to 84 thousand units. Asia & Oceania dominated, receiving 98.5% of global shipments. China alone accounted for 95%, followed by Vietnam (1.01%) and India (0.97%).

Double heater spindles, primarily used for polyester filaments, rose by 80% to 960 thousand units. Asia's share climbed to 98%, with China maintaining its dominance by absorbing 95% of these shipments.

Weaving Machinery: Shuttle-less Looms on the Rise

Shipments of shuttle-less looms expanded by 32% to 226 thousand units. "Air-jet" and "water-jet" categories grew by 10% and 56% to 58 thousand and 143 thousand looms, respectively, while "rapier and projectile" looms declined by 7% to 25 thousand units.

Asia & Oceania absorbed 97% of all shuttle-less looms, with China as the top destination across all categories. Chinese investments rose 30% for air-jet, 38% for rapier/projectile, and an impressive 63% for water-jet looms.

Knitting Machinery: Flat Knitting Up, Circular Knitting Down

Large circular knitting machine shipments declined by 15% to 28 thousand units. Asia & Oceania accounted for 81% of global shipments, led by China (45%, or 10,786 units), though Chinese orders dropped 42%. India (3,899 units) and Vietnam (2,559 units) followed.

In contrast, electronic flat knitting machines saw a 16% increase, reaching 135 thousand units. Asia & Oceania once again led, receiving 96% of total deliveries. China alone absorbed 82% of all shipments, confirming its continued investment in advanced knitting technologies.

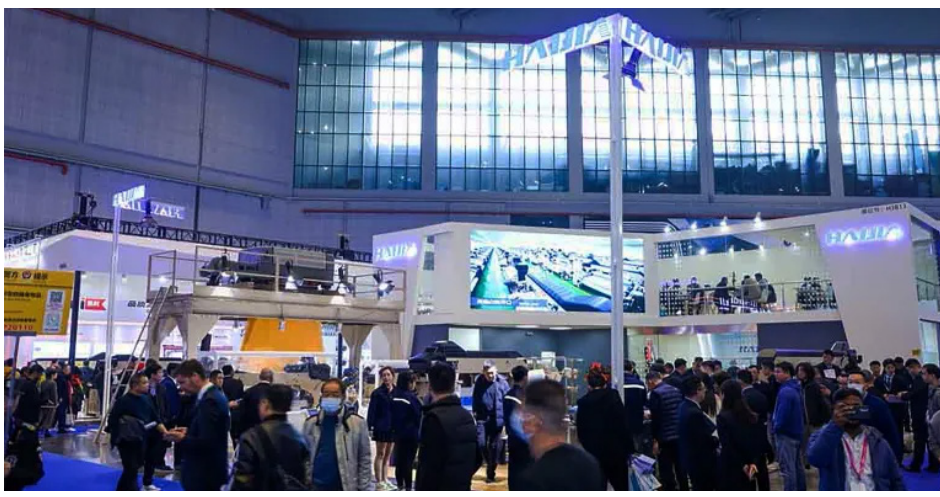
Space applications now open for ITMA ASIA + CITME 2026 in Shanghai

Amzad Hossain Monir

The official space application process for ITMA ASIA + CITME 2026 opened, setting the stage for what promises to be another landmark event for the global textile machinery industry. The exhibition is scheduled to be held from 20 to 24 November 2026 at the National Exhibition and Convention Centre in Shanghai, one of Asia's premier event venues.

Prospective exhibitors are encouraged to submit their applications through the official website, www.itmaasia.com, before the deadline on 24 March 2026.

Celebrating its 10th combined edition, ITMA ASIA + CITME continues to serve as Asia's leading business platform for textile machinery. The event is poised to foster innovation, collaboration, and commercial opportunities across the textile manufacturing value chain. The success of the 2024 edition underscores the significance of this biennial event. That edition covered 160,000 square metres and hosted over 1,700 exhibitors from 22 countries and regions. Notably, many local and international brands used the platform for high-profile product launches, which were met with an enthusiastic reception from attendees.



Over 90,000 visitors from 111 countries and regions attended the five-day event in 2024, with robust domestic participation from all 31 provinces, cities, and autonomous regions across China. The scale and diversity of attendance affirm the exhibition's pivotal role in the industry.

According to the joint show owners CEMATEX, the Sub-Council of Textile Industry of CCPIT (CCPIT TEX), the China Textile Machinery Association (CTMA), and the China International Exhibition Centre Group Corporation (CIEC) many previous exhibitors have already expressed strong interest and high expectations for the 2026 edition.

The exhibition is organised by Beijing Textile Machinery International Exhibition Co., Ltd and co-organised by ITMA Services, with the Japan Textile Machinery Association serving as a special partner.

European Commission to withdraw Anti-Greenwashing rules after pushback

Rahbar Hossain

The European Commission announced that it plans to withdraw new anti-greenwashing rules after they faced last-minute opposition from conservative lawmakers who argued the rules were too burdensome for businesses.

The proposed "Green Claims Directive" would have required companies to provide concrete evidence for claims that their products are carbon-neutral, biodegradable, or "less polluting."

Businesses would have had to submit this evidence for approval by independent verifiers, with penalties such as fines for non-compliance. Last year, European lawmakers and the EU's

> ***In the current context, the Commission intends to withdraw the Green Claims proposal***
>
> **Maciej Berestecki**
> EU's spokesperson for environmental issues.

27 member states had agreed to move forward with the directive. It was in the final stage of negotiations between the European Parliament, the Council, and the Commission, with a concluding meeting set for Monday.

The European People's Party (EPP), the

largest political group in the European Parliament requested the Commission to withdraw the proposal earlier this week. They argued that the directive was too complex and placed too much burden on businesses.

Berestecki explained that the decision aligns with the Commission's "simplification agenda," as the current version of the directive would have applied to around 30 million micro-enterprises, or 96% of all EU firms that something the Commission viewed as problematic.

EU President Ursula von der Leyen, a member of the EPP, has made it a priority to reduce bureaucratic hurdles for businesses as part of efforts to boost the European economy.

> ***We need regulation that is clear, proportionate, and grounded in evidence. Less bureaucracy and more competitiveness, that's what we promised to citizens.***
>
> **Danuse Nerudova**
> EU's spokesperson for environmental issues.

Danuse Nerudova, the EPP's negotiator on the directive, welcomed the withdrawal, calling the proposal "overly complex" and saying it lacked an adequate impact assessment to prove its benefits outweighed the costs to businesses.

> ***We need regulation that is clear, proportionate, and grounded in evidence. Less bureaucracy and more competitiveness, that's what we promised to citizens.***
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> **Danuse Nerudova**
> EU's spokesperson for environmental issues.

On the other hand, Sandro Gozi of the centrist Renew group called the decision "shameful". Since the EU Parliament shifted further to the right after last year's elections, the bloc has launched a broad effort to cut "red tape" seen as holding back economic growth even if that means rolling back key parts of von der Leyen's Green Deal from her first term.

Most notably, a much-debated law requiring companies to ensure their global supply chains are free of human rights and environmental abuses has now been delayed until 2028, and its future is uncertain.

The Green Claims Directive was just one of several EU efforts to tackle greenwashing. Another law passed last year already bans vague, generic product labels like "eco-friendly" or "natural."

Taekwang Industry announces ACECOOL-BIO: a plant based nylon yarn

Jack Thompson

Taekwang Industry, a leading vertically integrated textile under the Taekwang Group, has launched ACECOOL-BIO, South Korea's first domestically produced plant-based nylon yarn.

ACECOOL-BIO represents a significant breakthrough in the development of next-generation synthetic fibres. Derived from renewable plant-based sources, the yarn is engineered to surpass the functional boundaries of conventional chemical fibres, offering enhanced moisture absorption, superior breathability, and vibrant dyeability.

According to Taekwang Industry, ACECOOL-BIO not only caters to the increasing consumer demand for cool-touch textiles, particularly in sportswear, innerwear, and summer workwear, but also delivers impressive environmental benefits. The company revealed that the carbon emissions generated during the production of ACECOOL-BIO are reduced by more than 50% compared to traditional cool-touch nylon fibres. This places the innovation squarely in line with the global push for low-impact manufacturing solutions.

The yarn is also optimized for the dyeing process. With shortened dyeing times and richer, more vibrant coloration, ACECOOL-BIO aims to streamline textile processing while enhancing the quality of finished garments.

Photo: *ACECOOL-BIO: a plant based nylon yarn*

ACECOOL-BIO is not just to introduce a new material, but to transform the expectations of what sustainable textiles can achieve. This launch reflects o to expanding ESG (Environmental, Social, and Governance) management in the fashion industry.

Looking ahead, Taekwang Industry plans to further diversify its sustainable fibre portfolio with additional brand launches in the second half of the year. These efforts align with the company's broader vision to lead the market in high-performance, low-impact textile solutions.

Thermal innovation woven in: the Gentoo Heater by LOOMIA & AFFOA

Harry White

In the rapidly advancing field of electronic textiles, innovation often walks hand-in-hand with necessity. Addressing the pressing demand for reliable thermal solutions in extreme climates, LOOMIA, in collaboration with the Advanced Functional Fabrics of America (AFFOA), proudly unveils the Gentoo Flexible Heater, a breakthrough in cold-weather textile technology.

> ***Helping LOOMIA and other companies shorten their time to market is the purpose of the Product Accelerator for Functional Fabrics (PAFF) program. Heating technology like the Gentoo Heater will play a major role in the future of high-performance textiles to protect Warfighters and civilians in extreme temperatures.***
>
> **Sasha Stolyarov**
> CEO of AFFOA

Engineered for Extremes: The Gentoo Heater Advantage

At the core of the Gentoo Heater is a thermoplastic polyurethane (TPU)-based resistive heating element, meticulously engineered to perform under the harshest conditions delivering consistent and reliable heat even at temperatures plunging to -60°C. This remarkable capability positions the Gentoo Heater as a game-changer for environments where traditional heating solutions falter.

A Fabric of Innovation: LOOMIA and AFFOA's Collaborative Legacy

The Gentoo Heater marks another milestone in the fruitful collaboration between LOOMIA, a leader in flexible electronics and smart textiles and AFFOA, a national non-profit dedicated to transforming fibers into high-performance systems.

In this partnership, LOOMIA contributed its cutting-edge e-textile components, while AFFOA led product development, producing over ten functional prototypes, creating system architecture, and building a user-ready interface control unit paving the way for solutions that blend science with usability.

Sensor technologies of yarn manufacturing for intelligent spinning

M A Mohiemen Tanim

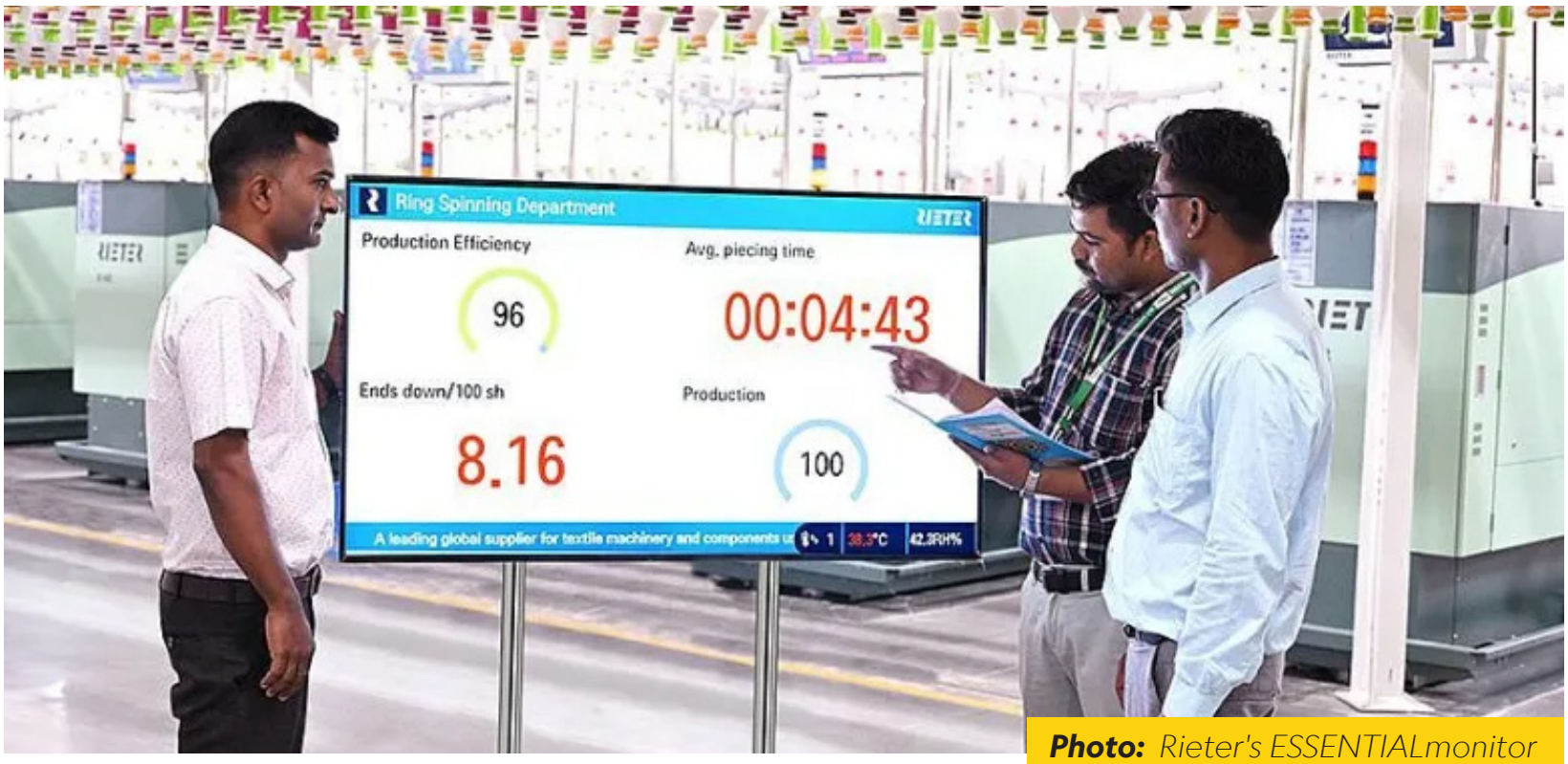

Photo: *Rieter's ESSENTIALmonitor*

The spinning mill is the heart of textile production, where raw fibers—whether natural, like cotton, or synthetic—are meticulously converted into yarn. At the pivotal stage where a single fibre strand becomes three—roving, sliver, and yarn—the role of sensors is critical to guarantee quality, speed, and efficiency.

The Spinning Process: Where Fibre Becomes Three

Stages of Fibre Consolidation

» **Blow Room & Carding:** Fibres are cleaned, blended, and carded into a soft, cohesive web, then condensed into a sliver.

» **Drawing & Roving:** Several slivers are drawn together to enhance uniformity, then drafted and slightly twisted to produce roving.

» **Spinning Frame:** Roving is stretched and twisted on ring, rotor, or air-jet spinning machines to create finished yarn.

At every stage, the precision and quality of the process are monitored using an array of innovative sensors.

Types of Sensors Used in Spinning Mills

1. Yarn Break Detectors

» **Function:** Instantly detect breakages in

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Rahbar Hossain
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the yarn, thereby reducing downtime and minimizing waste.

Example Providers:

» **KJTDQ** (Nanjing KJT Electric Co., Ltd.): Capacitor yarn break detectors and photoelectric yarn break detectors, suitable for winding, spinning, and synthetic fiber deformation.

» **Quanzhou Jingzhun Machine Co., Ltd.**: Yarn Break Sensor designed for rapid detection and minimal maintenance; widely used in the Chinese textile industry.

2. Optical and Capacitive Sensors

Function: Monitor the presence, movement, and quality of fibers and yarns using changes in light or electrical fields.

Applications:

» Detecting yarn stagnation or breakage.

» Measuring yarn thickness and uniformity.

Example Providers:

» **Loepfe Brothers Ltd.:** YarnMaster® PRISMA (dual measurement: capacitive and optical), P4-Sensor (4th Generation) for high-precision fault detection.

» **Uster Technologies:** Quantum 4.0 Smart Duo, combining capacitive and optical sensors for advanced yarn quality clearing.

3. Magnetic and Inductive Sensors

» **Function:** Track the rotational speed of components such as travelers and spindles; detect metallic contamination.

Example Providers:

» **Sensor Partners:** Magnetic field sensors for monitoring traveler rotation in ring frames, critical for ensuring yarn continuity.

» **Katlax Enterprises Pvt Ltd.:** Multiple sensor solutions, including inductive proximity sensors designed for textile machinery.

4. Color and Structure Sensors

» **Function:** Verify color, pattern, and fabric texture accuracy for quality assurance.

Example Providers:

» **Sensor Instruments (Sensor Partners):** Hybrid sensors (e.g., COAST) capable of measuring color and structure in textiles, distinguishing front/back surfaces, and maintaining homogeneity in materials.

5. IoT-Enabled Environmental Sensors

Function: Monitor ambient parameters such as temperature, humidity, and air quality to optimize conditions for fibre processing.

Example Providers:

» **Rieter:** ESSENTIALmonitor module for real-time production and environmental oversight, optimizing machine operation and reducing waste.

» **IoT Sensor Platforms**: Various industry

vendors offer sensor nodes to measure key environmental factors, integrating real-time data for process control.

Advanced Technologies and Innovations

Digital Yarn Quality Monitoring

» **Online Spindle Monitoring:** Each spinning position is continuously tracked by sensors to promptly flag any production issues, allowing more precise interventions and less off-quality yarn.

» **Rieter Digital Spinning Suite (ESSENTIALmonitor):** Monitors each ring and compact spinning machine's performance, identifies stop events, and tracks productivity—raising output and reducing manpower by up to 10%.

Dual Measurement Sensor Technology

» **Uster Quantum 4.0:** Utilizes both capacitive and optical methods in tandem (Smart Duo). Features "Cross Clearing" to eliminate hidden faults, and includes options for blend mix-up detection and polypropylene contamination monitoring.

» **Loepfe YarnMaster® PRISMA:** Combines optical, capacitive, and RGB-F sensor channels for detecting yarn irregularities, foreign matter, and color variations simultaneously.

Optical Fibre-Based Sensors

Integration in Automated Weaving: Optical fibers incorporated in textiles and machinery for higher data throughput and for real-time structural monitoring. Can be adapted for in-process yarn monitoring for applications such as wearables and e-textiles.

Leading Sensor Providers and Their Products

Provider	Product(s) and Features	Application
KJTDQ	Capacitor yarn break detector, photoelectric yarn detector	Yarn break/stoppage detection
Uster Technologies	Quantum 4.0 Smart Duo; capacitive + optical smart clearing	Yarn quality control, fault detection
Loepfe Brothers Ltd.	YarnMaster® PRISMA, P4-Sensor, YarnMaster® ZENIT+	Yarn clearing, rotor yarn inspection
Sensor Partners	Laser, magnetic, and color sensors	Color, texture, traveler monitoring, surface checking
Quanzhou Jingzhun Machine	Yarn Break Sensor	Real-time yarn breakage detection
Rieter	ESSENTIALmonitor, ISM Premium (spindle monitoring)	Plant-wide machine, spindle, and process oversight
Katlax Enterprises	Proximity, inductive, and digital temperature sensors	Machine/environmental monitoring

AI and IoT in Spinning

» **Artificial Intelligence:** Recent developments use AI and machine learning to predict maintenance needs, track process efficiency, and optimize machine parameters—ensuring fewer stoppages and higher consistency.

» **IoT Sensors and Cloud Analytics**: Real-time data collection and analytic processing enable mill-wide optimization and predictive maintenance, drastically reducing the risk of operational downtime.

Impact and Benefits of Sensor Technology

1. Real-Time Fault Detection:

» Sensors immediately notify operators of yarn breaks, end-outs, or sliver misfeeds—preventing large-scale defects and waste.

» Improved efficiency: Shift supervisors address problems swiftly, ensuring continuous high-quality production.

2. Enhanced Quality Assurance:

» Advanced clearing systems with dual sensors detect even minor flaws—such as hard-to-see fluff or blend mix-ups—ensuring consistent yarn quality.

» Color and structure sensors keep shade and surface uniformity within specification, vital for downstream processes.

3. Predictive Maintenance and Reduced Downtime:

» IoT-enabled sensors and AI analytics predict wear and tear, minimizing unscheduled stoppages and optimizing maintenance cycles.

4. Labour and Energy Savings:

» Automated real-time monitoring reduces the need for manual patrols and interventions, cutting labor costs and saving energy by preventing inefficient operation periods.

Conclusion

Sensors have brought a revolution to spinning mills, transforming how fibre is processed into yarn. With innovations like dual measurement sensors, IoT-enabled machine monitoring, and AI-driven quality and efficiency control, the modern spinning mill is a hub of precision. Providers like KJTDQ, Uster Technologies, Loepfe, Sensor Partners, and Rieter offer solutions that push the boundaries of what's possible, ensuring that every strand of yarn meets the textile industry's highest standards. As technology continues to advance, spinning mills using these latest sensor technologies are poised to thrive in the fast-changing global textile

Syre announces strategic partnerships with Gap Inc., Houdini, and Target to drive textile revolution

Harry White

Syre, the textile impact company on a mission to hyperscale textile-to-textile recycling, has announced a trio of influential strategic partners: Gap Inc., Houdini Sportswear, and Target. These Launch Partners will play a central role in bringing circular polyester to market, fast-tracking its adoption, and reshaping the global textile industry.

Founded in March 2024, Syre is determined to decarbonize and dewaste the textile sector by developing a global network of recycling plants capable of producing high-quality circular polyester. This innovative process reduces carbon emissions by up to 85% compared to traditional oil-based virgin polyester.

> ***We're proud to be among the first to support Syre's innovative textile solutions. This partnership enables us to accelerate our progress toward realizing a more circular fashion industry, Our ambition to utilize 10,000 metric tons per year of Syre's recycled polyester chip is not only an innovation that we feel will resonate with our customer, but it is an important lever for Gap Inc. in our efforts to bridge the climate gap.***
>
> **Dan Fibiger**
> Vice President of Global Sustainability at Gap Inc.

> ***With nature as our blueprint we envision a pure, waste free and circular flow of natural resources, products and a business model that are circular by design and companies like ourselves that act as custodians and caretakers of those resources. In partnership with Syre's ambition, we are closing in on that vision.***
>
> **Eva Karlsson**
> Co-founder and Chief Creative Officer at Houdini

The company has already begun construction of its first "blueprint" facility in North Carolina, USA, set to become operational in 2026. Once online, the plant will deliver up to 10,000 metric tons of circular polyester annually and Syre's newly announced partners will be the first to put it to use.

Three Industry Leaders, One Circular Vision

Gap Inc., the largest specialty apparel retailer in America, has entered the partnership with a bold ambition: to source 10,000 metric tons of Syre's recycled polyester chip annually. The move underscores Gap Inc.'s commitment to integrating more sustainable materials across its portfolio, which includes Old Navy, Gap, Banana Republic, and Athleta.

Houdini Sportswear, the Swedish technical outdoor brand known for its pioneering work in circular innovation, is aiming for a fully circular and waste-free ecosystem by 2030. Through this partnership, Houdini has committed to sourcing 50% of its polyester usage from Syre over the next three years.

Target, which serves millions of guests across nearly 2,000 stores and online at Target.com, has also joined forces with Syre as part of its broader sustainability strategy. Target aims to design 100% of its owned brand products for a circular future by 2040, and this partnership will introduce Syre's circular polyester into select product lines.

A Turning Point for the Textile Industry

The partnerships come at a critical time. Joint research from Syre and McKinsey reveals a projected 10–12 million metric ton annual shortfall in recycled polyester supply by 2030. With bottle-to-fiber solutions facing regulatory decline due to their non-circular nature, textile-to-textile recycling is rapidly emerging as the new standard.

> ***We are thrilled to announce our partnerships with these esteemed and forward-thinking brands, representing different segments and sizes.***
>
> ***They are truly front runners, understanding the need to secure capacity of a scarce resource to be. As we embark on the next phase of scaling at speed, we're confident that these collaborations will not only bolster commercial success but also help redefine the industry and drive the urgent shift towards true circularity."***
>
> **Dennis Nobelius**
> CEO of Syre

Microban International launches PFAS-free water-resistant textile technology

Matthew Davis

Microban International, globally recognized for its leadership in antimicrobial and odor control technologies, has unveiled a groundbreaking portfolio of PFAS- and PFOS-free water-resistant textile finishes. Branded as H_2O Shield, this new line marks Microban's strategic expansion into water-resistant solutions and underscores its commitment to environmentally responsible innovation.

As global scrutiny of per- and polyfluoroalkyl substances (PFAS) intensifies, Microban's H_2O Shield offers a timely and vital alternative. PFAS, including PFOS, are widely used synthetic chemicals known for their environmental persistence and potential health risks. In response to growing consumer demand and regulatory pressure, brands across industries are increasingly seeking PFAS-free alternatives. Microban's new technology is designed to meet this need without compromising performance.

A Tailored Portfolio for Diverse Textile Needs

The H_2O Shield portfolio features four distinct water-repellent formulations, each engineered to address specific performance requirements and aesthetic challenges across a wide range of textile applications:

WR1000: Ideal for general water repellency in low-contact applications such as shower curtains, tents, and awnings.

WR1001: Optimized for moisture-wicking and sweat resistance, targeting high-performance apparel like running gear, ski jackets, and workout clothing.

WR1002: Specifically formulated to reduce chalking and color shifts on dark fabrics prone to wear, such as outdoor gear and gloves.

WR1003: Enhances tear resistance and reduces seam slippage, making it ideal

Photo: *H_2O Shield*

for rugged applications like backpacks and heavy-duty tents.

To further enhance adaptability, Microban offers WR-P, an optional pretreatment that extends compatibility to challenging fabrics. WR-P allows manufacturers to reduce the required dosage of water-repellent agents by 15–20% while improving wash durability—a critical factor in long-term textile performance.

Proven Performance, Sustainable Solution

The H_2O Shield technology delivers exceptional water resistance, consistently achieving ratings of 80 or higher on the AATCC TM22 spray repellency test. Equally notable is the finish's durability through 20+ home launderings, ensuring extended protection without environmental trade-offs.

Importantly, the finishes are applied using standard wet processing techniques, such as pad baths and exhaust cycles, making the transition seamless for textile manufacturers and brands already equipped with conventional finishing infrastructure.

Integrated Functionality and Brand Support

In a move that further distinguishes the H_2O Shield portfolio, Microban has designed the finishes to integrate effortlessly with its existing antimicrobial and odor control technologies. This integrated approach enables manufacturers to deliver multi-functional textiles that meet evolving consumer expectations for sustainability, hygiene, and performance.

> ***Microban provides a unique turnkey support structure, assisting our partners in combining finishing technologies while ensuring compliance and compatibility. Partners can also leverage our technical and testing support and trusted brand names. This synergy allows brands to deliver multi-functional performance with tailored solutions, protecting and extending the overall life of textile goods and delivering what consumers desire.***
>
> **Michael Ruby**
> President of Microban International

Cotton Incorporated launches reimagined CottonWorks™ platform

Luke Wilson

Photo: *Cotton Incorporated Launches Reimagined CottonWorks™ Platform*

Cotton Incorporated has unveiled a completely reimagined CottonWorks™ platform. More than just a redesign, the newly launched site marks a pivotal digital transformation one that brings forward-thinking tools, fashion-forward design, and comprehensive resources to the fingertips of global apparel and textile professionals.

With today's industry landscape rapidly evolving, Cotton Incorporated's relaunch comes at a crucial moment. Shifting business models, reduced in-person factory visits, and increased demands around compliance, sustainability, and speed-to-market have transformed the way textile professionals operate. CottonWorks™ has emerged as a direct

> ***In today's landscape, companies continue to evolve the way they do business, and so do we. Today's professionals are working in a very different environment than they were even just a few years ago... They need reliable, in-depth knowledge that helps them tackle challenges like compliance and product development.***
>
> **Mark Messura**
>
> Senior Vice President, Global Supply Chain Marketing at Cotton Incorporated

> ***The newly launched CottonWorks site is a comprehensive resource for anyone in the apparel industry. Thank you for providing such a tremendous amount of relevant, valuable information and educational tools all in one, easy to navigate, website.***
>
> **Doug Tepper**
>
> Vice President of Sourcing, Quality, Compliance & ESG at J.Jill

response to these shifts providing an intuitive, user-focused experience that seamlessly integrates learning, sourcing, development, and marketing tools in one centralized platform.

Designed for the Way Professionals Work Today

The relaunch was grounded in extensive research that identified a growing need for flexible, digital-first tools. Today's professionals demand immediate, credible, and actionable information. CottonWorks™ rises to meet that need with features that empower users across every segment of the value chain—from initial concept to finished product.

Key features of the revamped platform include:

Personalized User Dashboards: Streamline workflow by bookmarking favorite content and accessing relevant tools in one place.

Enhanced Learning Hub: Offers an expansive library of on-demand educational videos, tutorials, and training materials to support ongoing professional development.

Downloadable Digital Resources: Access 3D fabric files, compliance guides, technical specs, and supplier directories to support agile product development.

Expanded Trend and Sustainability **Content:** Includes sections on forecasting, traceability, circularity, and recycling—addressing the industry's growing focus on sustainable innovation

> ***The newly launched CottonWorks site is a comprehensive resource for anyone in the apparel industry. Thank you for providing such a tremendous amount of relevant, valuable information and educational tools all in one, easy to navigate, website.***
>
> **Doug Tepper**
>
> Vice President of Sourcing, Quality, Compliance & ESG at J.Jill

LYCRA® Fiber achieves prestigious Cradle to Cradle Certified® Material Health Gold, V4.0

Rahbar Hossain

Photo: *LYCRA® Fiber Achieves Prestigious Cradle to Cradle Certified® Material Health Gold, V4.0*

The LYCRA Company has announced a significant step forward in sustainable innovation with its flagship LYCRA® fiber earning the Cradle to Cradle Certified® Material Health Gold certification, Version 4.0, a globally respected benchmark for material safety and environmental responsibility.

Awarded by the Cradle to Cradle Products Innovation Institute, this certification affirms that over 70% of LYCRA® brand apparel fibers meet the rigorous requirements of Version 4.0 of the Cradle to Cradle Certified® Product Standard. It also signals that these fibers are free from harmful substances and are manufactured using responsibly sourced

> ***This certification is important because it's a third-party, independent validation of our products' material health, which is aligned with leading chemical regulations. It's not just us saying our product is safe. This is a globally recognized standard granted by an independent body. It provides confidence for our commercial partners and for the consumers who wear our fibers every day.***
>
> **Dr. Francis Mason**
>
> The LYCRA Company's C2C project lead and technical manager based in Maydown, Northern Ireland

materials.

A Collaborative Global Effort

Achieving the Gold level of Cradle to Cradle Certified® Material Health V4.0 required an intensive, company-wide effort spanning continents. The process included internal audits, supply chain assessments, material recipe documentation, and stringent laboratory analysis.

Key contributors included George Jiang, sourcing manager in Shanghai, who led supplier data collection; Dr. Ingo Ganz, global product stewardship manager, who coordinated analytical validation at the Benger Lab in Waynesboro, Virginia; and Sustenuto, an expert third-party assessment body that provided strategic guidance throughout the certification journey.

Compared to the previous V3.1 standard, Version 4.0 includes more stringent requirements, such as increased transparency in reporting, a mandatory on-site audit, and the implementation of a long-term continuous improvement plan.

A Landmark in LYCRA®'s Sustainability Journey

The certification is the latest in a series of initiatives by The LYCRA Company to build a more sustainable product portfolio. Many of its fibers already meet respected third-party sustainability standards, including the Global Recycled Standard (GRS), Recycled Content Standard (RCS), and STANDARD 100 by OEKO-TEX®.

> ***Our product vision is to create resilient fibers that deliver on our brand promises, use fewer finite resources, extend garment wear life, and ultimately can be recycled or composted at end of life***
>
> **Steve Stewart**
>
> Chief Brand and Innovation Officer at The LYCRA Company

Later this year, the company is poised to launch a new breakthrough innovation: LYCRA® EcoMade fiber made with QIRA®, a bio-derived fiber composed of 70% renewable content sourced from field corn, primarily grown in Iowa. This next-generation fiber is projected to reduce LYCRA®'s carbon footprint by up to 44%* without sacrificing the quality or performance associated with the brand.

Collaboration of Rebag with Amazon brings authentic pre-owned luxury

Farin Tasnim Fariha

Rebag is a New York-based luxury resale platform founded by Charles Gora in 2014 that is known for its pre-owned handbags, watches, fine jewelry, and more. Since June 10, 2025, this partnership has brought nearly 30,000 authentic, pre-owned luxury items, including handbags and watches, to Amazon's online marketplace.

Customers are benefited from this collaboration. Rebag works to sell items. On the other hand, customers are benefited from Amazon Prime's free two-day delivery and hassle-free returns.

Rebag's rigorous inspection process ensures that buyers receive genuine, high-quality luxury goods in every product. The partnership provides access to a vast collection of nearly 30,000 pre-owned luxury goods, making high-quality resale more accessible to a wider audience.

The collaboration focuses on sustainability. By promoting the resale of luxury goods, the partnership supports sustainable shopping practices and the circular economy.

This partnership combines prestige and

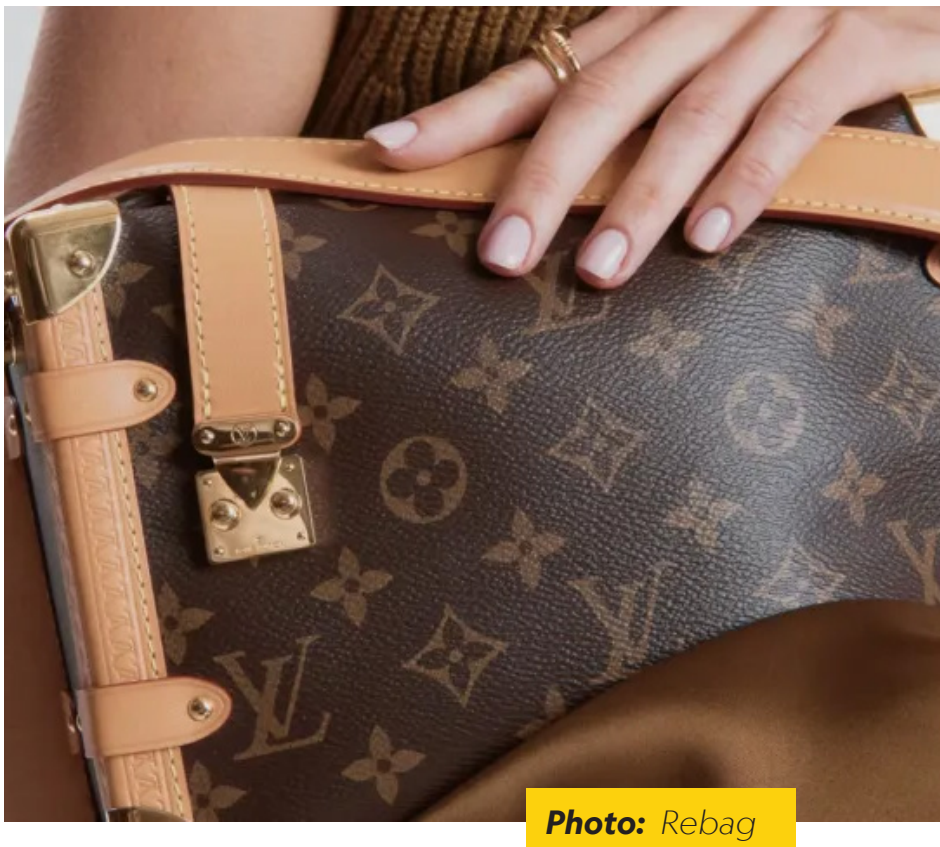

Photo: *Rebag*

trust. Rebag is a luxury resale space and global e-commerce giant Amazon is known for its convenience and scale.

It also highlights the growing importance of sustainability in luxury fashion, particularly targeting young, eco-conscious consumers. This strategic move by Amazon deepens its presence in the luxury market through partnerships rather than building a resale platform.

This allows luxury retailers to embrace circular fashion models and technology-enabled accessibility. It is hoped that this collaboration will meet the growing demand for sustainable luxury shopping.

AFFOA announces Dr. Eric Evans as Chair of its Board of Directors

Desk Report

Advanced Functional Fabrics of America (AFFOA), a Manufacturing USA innovation institute committed to reinvigorating the U.S. textile industry through advanced technologies and transformative manufacturing, proudly announces the appointment of Dr. Eric Evans as Chair of its Board of Directors. His appointment marks a significant milestone for AFFOA as it continues to forge ahead in redefining the future of textiles in both national defense and civilian sectors.

Photo: *Dr. Eric Evans, Chair of AFFOA's Board of Directors*

> ***We are honored to welcome Dr. Evans as our new Chair. His unparalleled expertise in defense technologies and his deep-rooted commitment to innovation will play a critical role as AFFOA continues to build on its mission of integrating electronics, sensors, and cutting-edge functionalities into next-generation fabrics."***
>
> **Dr. Sasha Stolyarov**
>
> CEO of AFFOA

A renowned expert in defense innovation and technology strategy, Dr. Evans steps into this role with over 30 years of experience at the intersection of research, engineering, and public service. Most notably, he served as the Director of MIT Lincoln Laboratory from 2006 to 2024, where he oversaw pioneering advancements across a broad spectrum of national security mission areas. He now serves as a Professor of Practice and Senior Fellow at the Massachusetts Institute of Technology, extending his influence in academia and policy.

Dr. Evans assumes the Chairmanship at a pivotal time for AFFOA and the broader U.S. manufacturing landscape. As global supply chains evolve and demand surges for domestic innovation, AFFOA is positioning itself at the forefront of advanced textile technology an area

where defense-grade performance and commercial-scale applicability converge. Under Dr. Evans' leadership, the organization is poised to expand its national impact by accelerating the commercialization of smart fabrics, enabling breakthroughs in wearable tech, environmental sensing, and adaptive clothing.

In addition to his leadership at MIT Lincoln Laboratory, Dr. Evans has served the nation with distinction, earning two Secretary of Defense Distinguished Public Service Medals for his contributions to defense science and policy. He is a Fellow of both the Institute of Electrical and Electronics Engineers (IEEE) and the American Institute of Aeronautics and Astronautics (AIAA), and a member of the prestigious National Academy of Engineering.

Ashfaque Ahmed joins Archroma as Transformation Director for Bangladesh and Sri Lanka

Rahbar Hossain

Archroma, a global leader in specialty chemicals and sustainable solutions, has announced the appointment of Ashfaque Ahmed as the new Transformation Director for Bangladesh and Sri Lanka. In this strategic leadership role, he will be responsible for driving technical transformation and aligning strategic initiatives across both countries.

Photo: *Ashfaque Ahmed*

With extensive experience in industrial operations and strategic planning, he will play a key role in driving Archroma's initiatives focused on operational excellence, innovation, and sustainable growth. His responsibilities will include leading technical teams, optimizing processes, and aligning regional transformation strategies with global objectives. This appointment underscores Archroma's continued focus on strengthening its regional presence and delivering sustainable, high-performance solutions to its partners and customers.

Strathberry and Kimpton Hotels launch sustainable luxury with "Borrow a Bag" experience

Farin Tasnim Fariha

"Borrow a Bag" is an exclusive experience that Edinburgh-based luxury accessories brand Strathberry has launched in partnership with Kimpton Charlotte Square (Edinburgh), a Kimpton hotel in Scotland. This unique experience permits guests at the Kimpton Charlotte Square Hotel in Edinburgh and the Kimpton Blythswood Square Hotel in Glasgow to enjoy a touch of luxury by borrowing a Strathberry handbag. Each hotel features a "Bag Library" with a curated collection of Strathberry designs.

Photo: *Rebag*

> ***This special collaboration with our friends and partners at Kimpton is a beautiful way to offer guests a sense of understated luxury that's both sustainable and deeply connected to our home country. We're delighted our bags can play a small part in making visitors' time in Scotland even more special.***
>
> **Leeanne Hundleby**
> Owner and co-founder of Strathberry

An innovative initiative for guest service is Kimpton Hotels' "Borrow a Bag" program. "Forgot? We got it!" refers to an extension of the traditional approach by giving guests with essential items that they may have lost.

Strathberry's has launched its first-ever rental in Scotland through the Strathberry brand. It allows guests to add a luxury handbag to their wardrobe. Guests also receive a complimentary card to Strathberry's Edinburgh boutiques to enhance their travel experience.

Strathberry's "Borrow a Bag" experience with Kimpton Hotels is a mix of luxury fashion and hospitality. It offers guests or travelers high-quality opportunities in a suitable, sustainable way. This opportunity emphasizes sustainable practices in the fashion industries.

Photo: *IHKIB - Istanbul Apparel Exporters Association conference*

IHKIB conference highlights EU-Türkiye textile vision

Benjamin Harris

During the IHKIB – Istanbul Apparel Exporters Association conference, EURATEX met with its Turkish members to discuss the twin transition of Türkiye's apparel industry, with a strong focus on sustainability and digitalization.

> ***There is a strategic interdependence between the EU and Turkish textile industries, and in times of global turbulence and uncertainty, it is more important than ever to reinforce this partnership***
>
> **Mario Jorge Machado**
> President of EURATEX

> ***Our mission is to ensure that the evolving EU regulatory landscape supports a transition that strengthens and enhances the competitiveness of the European textile industry***
>
> **Director General Dirk Vantyghem**

The delegation also toured Özak Tekstil and Aydintekstil two standout examples of Turkish innovation in action. These companies demonstrated remarkable progress in sustainable practices and digital integration, offering real-world proof of the industry's adaptability.

VIATT 2026 unveils new zones and bigger platform for textile innovation

Farin Tasnim Fariha

The Vietnam International Trade Fair for Apparel, Textiles and Textile Technologies (VIATT) is returning to the Saigon Exhibition and Convention Center (SECC) from February 26–28, 2026. Building on the success of its previous edition, which saw a nearly 13% increase in exhibitor participation, VIATT 2026 will expand its show floor by 20%, from 15,000 to 18,000 sqm, fully utilizing Halls A and B.

This strategic expansion brings new dedicated zones for apparel, fashion accessories, and textile chemicals and dyes, reinforcing Vietnam's position as a vertically and horizontally integrated textile hub. Despite global business headwinds, Vietnam remains a long-

> ***VIATT's second edition marked a 30% increase in buyers' internationality and a 10% rise in buyers overall, signifying the fair's crucial role in advancing Vietnam's textile industry. Next year's expanded showcase and its trend-focused approach will enable suppliers across the textile spectrum, within fashion, home, and technical segments, to connect with leading global brands, supporting Vietnam's shift from volume-driven exports to value-led innovative and sustainable manufacturing***
>
> **Ms Wilmet Shea**
> General Manager of
> Messe Frankfurt (HK) Ltd.

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term strategic market, bolstered by 17 new-generation free trade agreements (FTAs) that promote market and export diversification.

A Platform for Global Collaboration and Innovation

Ms. Wilmet Shea, General Manager of Messe Frankfurt (HK) Ltd, emphasized the fair's growing international significance

Key features of VIATT 2026 include trend-focused forums, sustainable textile showcases, and designer fashion shows. The Econogy Hub will return to spotlight eco-friendly materials, sustainable production methods, and certifications. This aligns with Vietnam's 2050 vision for a closed-loop textile economy, showcasing innovations in organic fibers, recycled synthetics, and low-impact dyeing technologies.

Driving Digitization: The Innovation & Digital Solution Zone

Continuing its push towards smart manufacturing, VIATT will further develop the Innovation & Digital Solution Zone. This area will exhibit AI-powered prototyping tools, automation systems, and supply chain optimization solutions empowering Vietnamese manufacturers to stay ahead in the global textile race.

Apparel Fabrics & Fashion: Paving the Way for Sustainable Growth

Vietnam's textile and garment industry continues to thrive, having generated over USD 44 billion in 2024 and targeting USD 48 billion in 2025. To support this growth, VIATT 2026 will introduce new product offerings including finished apparel, a Fashion Label Zone for boutique fashion houses, and a Fashion Accessories Zone featuring bags, footwear, and jewelry.

These new areas are expected to attract global buyers such as Tory Burch and Zara, among others. VIATT 2025 had already welcomed renowned brands including American Eagle, Nike, Puma, Lululemon, J.Crew, Target, and Wacoal. Southeast Asian buyers also responded strongly to the diverse international offerings.

Home & Contract Textiles: Riding the Wave of Urbanization

> ***We have brought fashion embroidery fabrics and polyester embroidery yarns, predominantly for stylish women's wear. Southeast Asia is undoubtedly a key focal point for the future evolution of Asia-Pacific's economy, and I regard this exhibition as a crucial avenue for penetrating the Southeast Asian market. I've seen a promising visitor flow and good quality customers, and notably met interested parties from Vietnam, Thailand, India, and other parts of the region.***
>
> **Mr Bao Jia Cheng**
> Shaoxing Sunsmile Textile Co Ltd.

> ***We are a home textiles company managing American clients' orders in China. There have been promising leads, especially Chinese suppliers who have already opened a good number of factories in Vietnam, and in India, Myanmar, and Indonesia. I have already found OEKO-TEX and BSCI certified suppliers at VIATT 2025, which are very important for our clients***
>
> **Mr. Dennis Macharia**
> Sourcing Home Textiles China at
> Maaron International Procurements

The home textile market in Vietnam is experiencing rapid growth, projected to rise from around USD 3 billion in 2025 to nearly USD 4 billion by 2030. VIATT 2026 aims to capitalize on this trend by expanding displays of finished home and contract textile products ranging from luxury bedding to commercial-grade fabrics for hospitality and residential applications.

In support of sustainability, VIATT's Econogy Check continues to help buyers quickly identify exhibitors with verified eco-credentials. Approved exhibitors are listed in the online Econogy Finder directory, simplifying the sourcing of sustainable partners.

Technical Textiles & Technologies: Forging the Future

With a projected CAGR of 6.5% from 2024 to 2032, the global technical textiles market is expected to surpass USD 390 billion by 2032. VIATT 2026 will play a pivotal role in this growth by introducing a new Textile Chemicals & Dyes Zone. This area will feature solutions for chemical recycling, fiber production, dyeing, and finishing, including advanced pigments and specialty additives.

Core segments such as Clothtech (clothing), Indutech (industrial), Mobiltech (automotive), Medtech (medical), Protech (protective), and smart textiles with UV and moisture-wicking features will also be spotlighted—cementing VIATT's role as a gateway to textile innovation.

VIATT 2026

Dates: February 26–28, 2026

Venue: Saigon Exhibition and Convention Center (SECC), Ho Chi Minh City, Vietnam

Gotham Foundry: NYC's new hub for green tech, startups and jobs

William Moore

Gotham Foundry is an innovation hub for sustainable materials research and commercialization. Its main target is to support early-stage and technology companies. It aims to reduce industrial waste and pollution in industries such as biodegradable bio-plastics, food, textiles and fashion made from various products, packaging, and medical devices. Also, it aims to encourage innovation in renewable materials with a circular life cycle.

Photo: *Gotham Foundry the Innovation Hub*

> ***Gotham Foundry will support a new generation of research and entrepreneurship, generating billions of dollars in economic output for the City, creating high-quality career opportunities for New Yorkers and catalyzing transformative change across industries—from construction to fashion to healthcare—in the process.***
>
> **Andrew Kimball**
> NYCEDC President & CEO

The center is a collaborative academic-industrial hub. It brings together top universities, research centers, and community labs to drive interdisciplinary innovation in sustainable materials, and creates a unique environment for commercialization. At the same time, it is working to maximize resource efficiency.

The initiative is expected to generate $5.14 billion in economic output over the next 30 years, while also creating high-quality employment and workforce training opportunities for New Yorkers.

LifeSci NYC focuses to create millions of jobs at once. The center is a key part of New York City's broader Green Economy Action Plan and the LifeSci NYC initiative.

The center will impact a wide range of industries, including fashion, healthcare, packaging, and more. This initiative emphasizes equity. It provides workforce development and entrepreneurship training.

New platform CIRCULOSE® Forward accelerates sustainable fashion

Farin Tasnim Fariha

Photo: *CIRCULOSE® Forward*

Circulose has officially launched CIRCULOSE® Forward, a new platform designed to scale circular solutions and help brands transition toward low-impact, Next Gen materials. Backed by environmental nonprofit Canopy, this innovative platform is being indicated as a game-changer for the future of fashion.

Developed by Circulose, CIRCULOSE® Forward is a comprehensive ecosystem that provides practical tools including a digital materials library, price benchmarking capabilities, and a streamlined supplier network. The aim is to simplify and advance the integration of circular, sustainable fibres

> ***We're proud to support Circulose's launch of CIRCULOSE® Forward. This platform provides practical, scalable solutions that align with both climate science and market needs. It's the kind of innovation that helps the industry leave deforestation in the past and move decisively toward a resilient, low-carbon, Next Gen future.***
>
> **Nicole Rycroft**
> Founder and Executive Director of Canopy

> ***"Environmental and social sustainability are a fundamental pillar of Mango's business model. The launch of CIRCULOSE® Forward provides an innovative solution that aligns with our goal to exclusively use fibres with lower environmental impact by 2030 and to foster a more circular and responsible fashion ecosystem."***
>
> **Andrés Fernández**
> Sustainability and
> Sourcing Director at Mango

into mainstream fashion production, without sacrificing quality, design, or commercial performance.

Nicole Rycroft, Founder and Executive Director of Canopy, emphasized the platform's importance in aligning climate and market demands.

> ***"At Tommy Hilfiger, we believe the future of fashion should be circular, and we're taking steps to make it a reality today. The launch of CIRCULOSE® Forward supports the scaling of CIRCULOSE® within our collection and achieving our goal to increase our use of more innovative materials."***
>
> **Thijs Maartens**
> VP Global Sustainability
> at Tommy Hilfiger

The announcement comes at a time when leading brands are increasingly focused on responsible sourcing and environmental impact. Andrés Fernández, Sustainability and Sourcing Director at Mango, sees CIRCULOSE® Forward as directly supporting their sustainability strategy.

> ***"We are really glad to see that Circulose could overcome some of its barriers, because they were a proof of the state of the industry when implementing innovation. We repeatedly support their work for two main reasons: We believe in the material, and we also want to prove to ourselves that products can be made differently, while still being equally relevant, long lasting, and beautiful. Our respect and admiration for the role that Canopy plays in supporting the fashion industry in its sustainable transformation is huge, and we are very grateful to be part of this joint initiative. If you go together you go further, and when it comes to impact, long-term commitments are crucial."***
>
> **Cecilia Guarás**
> I+D and Sustainability Manager,
> Bobo Choses

> ***"As the first production partner of Circulose, we are proud to be a pioneer in driving the Man-Made Cellulosic Fibre industry toward a more sustainable path, delivering high-quality, recycled MMCF products to our customers and their end consumers."***
>
> **Zhang Dongbin**
> Executive Vice President at
> Tangshan Sanyou Chemical Fibre Co.

The excitement is echoed across the industry. Thijs Maartens, VP Global Sustainability at Tommy Hilfiger, underlined the brand's vision for a more circular future.

For companies like Bobo Choses, the platform represents both innovation and proof of progress. Cecilia Guarás, I+D and Sustainability Manager, shared,

On the production side, partners are equally enthusiastic. Zhang Dongbin, Executive Vice President at Tangshan Sanyou Chemical Fibre Co., commented,

Sucharu Uppal, Joint President, Brands & Retail at Grasim Industries Limited / Aditya Birla Group, highlighted the platform's potential to reshape value chains,

With CIRCULOSE® Forward, Circulose and its partners are offering the fashion industry not just a toolkit but a transformational model for how materials are sourced, shared, and scaled. As pressure mounts on the industry to deliver tangible climate action, this platform may well be the bridge between ambition and achievement.

> ***"The launch of CIRCULOSE® Forward represents a significant step in providing scalable, sustainable, and ready-to-be-plugged-into value chain solutions to brands. By integrating high-quality recycled materials like CIRCULOSE® into our fibre offerings, we support our partners in reducing environmental impact while meeting the growing demand for circular fashion."***
>
> **Sucharu Uppal**
>
> Joint President, Brands & Retail at Grasim Industries Limited / Aditya Birla Group

Birch Biosciences and NREL join forces to revolutionize plastic recycling with enzymatic technology

Daniel Brown

> ***This licensing agreement marks a major step toward a circular plastic economy using biological solutions, NREL's technology complements our platform and helps us scale low-cost, efficient recycling.***
>
> **Dr. Johan Kers**
> Co-founder and CEO of Birch

Birch Biosciences, an AI-driven startup focused on enzymatic plastic recycling, has signed a global patent license agreement with the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) to commercialize a cutting-edge enzymatic process for recycling polyethylene terephthalate (PET), a widely used plastic in packaging and textiles.

Developed by NREL, the licensed technology efficiently breaks down PET into its original high-value monomers, which can be remanufactured into virgin-quality PET. Unlike traditional recycling methods, this enzymatic approach works under mild conditions,

Photo: *Birch Biosciences*

avoiding quality loss, toxic solvents, and high energy use offering a scalable and sustainable alternative.

Birch Biosciences will integrate NREL's downstream chemical processes into its AI-powered biocatalytic platform, accelerating the development of closed-loop recycling solutions.

With over 400 million tons of plastic produced globally each year and only a fraction effectively recycled, this partnership aims to tackle a major environmental issue and reshape plastic as a renewable resource.

> ***This partnership highlights the power of lab-to-market collaboration to solve real-world plastic waste challenges,***
>
> **Dr. Gregg Beckham**
> Senior research fellow at NREL

Circulose partners with Mango to scale circular fashion forward

Daniel Brown

Circulose has announced a new partnership with global fashion brand Mango, marking a major step toward scaling circular materials in the fashion industry. Mango becomes the first Scaling Partner since Circulose's restart, reinforcing its commitment to sustainability and circularity.

> ***We're proud to support Mango's strong ambitions in circularity. Their commitment sets a powerful example for the industry.***
>
> **Jonatan Janmark**
> CEO of Circulose

The partnership supports Mango's goal to shift a significant portion of its man-made cellulosic fiber (MMCF) usage to lower-impact alternatives like CIRCULOSE® a regenerated material made entirely from discarded textiles. This move aligns with Mango's strategy to use only low-impact fibers by 2030.

> ***We're proud to support Mango's strong ambitions in circularity. Their commitment sets a powerful example for the industry.***
>
> **Andrés Fernández**
> Sustainability and Sourcing Director at Mango

Circulose's updated business model includes a licensing system developed with Fashion for Good and Canopy, aimed at reducing cost barriers and promoting large-scale adoption. The license includes added services like supply chain support and traceability.

Mango echoed this sentiment, highlighting the alignment of the partnership with its 2030 sustainability goals.

This partnership signals a major leap toward making circular fashion mainstream, moving beyond limited collections to widespread adoption.

US Government issues first-ever report on Textile Waste: a wake-up call for Fast Fashion and Federal Policy

Luke Wilson

For the first time, the United States government has officially recognized the growing problem of textile waste, releasing a federal report that highlights the issue and proposes coordinated action to address it.

Photo: *Image of heaps of apparel and other textile waste*

> ***The system needs to make sustainable actions intuitive and easy,***
>
> **Brittany Sierra**
> Founder of the Sustainable Fashion Forum.

The report, spearheaded by the Government Accountability Office (GAO), details how textile waste in the U.S. has surged by over 50% between 2000 and 2018, driven largely by fast fashion and an inadequate national system for recycling and reuse.

In addition to environmental concerns such as microplastics and toxic chemicals leaching into land and water as textiles rot in landfills, the report outlines seven federal recommendations. These include expanding textile recycling efforts, reducing overall waste, and establishing funding opportunities across federal, state, and local levels. A key proposal is the formation of an interagency task

> ***If the private sector doesn't step up and demand action, we'll be stuck with a patchwork of costly and ineffective state laws,***
>
> **Kibbe warns**

> ***There's a powerful case to be made for job creation and innovation in textile recycling. We need to focus not just on the environmental crisis, but also on the economic opportunity. That's what will get policymakers and businesses on board.***
>
> **says Kibbe**

force, uniting six major federal entities including the Environmental Protection Agency, National Institute of Standards and Technology, Office of Science and Technology Policy, Department of State, Department of Energy, and National Science Foundation to lead the charge.

However, the agencies quickly resisted the call for cross-agency coordination, casting doubt on the implementation of the report's recommendations. Despite the pushback, the GAO has stood firm, maintaining that such collaboration is essential to real progress. Private sector engagement, experts argue, will be critical to driving change. Rachel Kibbe, CEO of Circular Services Group, notes that without industry pressure, the issue could be left to fragmented and burdensome state regulations.

One glaring omission in the GAO report, critics say, is the lack of attention to economic potential?

Fast fashion turns into waste in Nepal

Rahbar Hossain

Photo: *Environmental Impact of Fast Fashion*

Nepal is currently facing a fast fashion crisis, destroying its environment, economy, and traditional culture. According to the World Bank, about 48% of Nepal's imported clothing comes from China and 41% from India. Most of the clothing in the country is cheap and of poor quality.

There is a government ban on the import of used clothing. Rivers, public spaces, and landfills around Kathmandu still contain piles of new, substandard clothing, which is becoming textile waste. These items are disposable and are thrown away after only a few uses.

As a result, there is a terrible impact on the ecosystem of Nepal. Nepal is

Photo: *Fast Fashion Crisis*

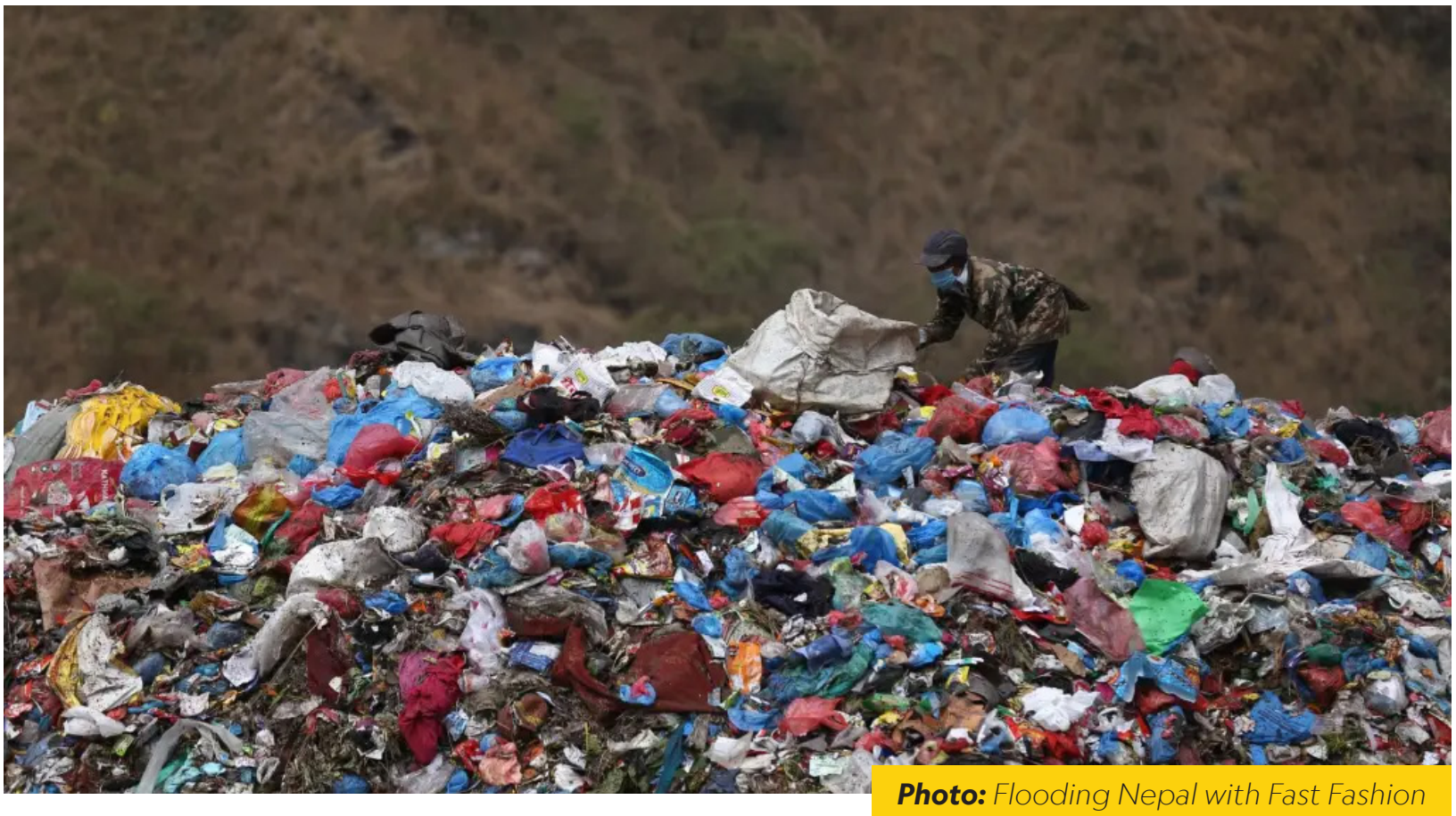

Photo: *Flooding Nepal with Fast Fashion*

ranked as the fourth most vulnerable country to the impacts of climate change. But it contributes only 0.027% of global greenhouse gas emissions. 6,000 rivers and vast landscapes of this country, from the Himalayas to the plains, are suffering from waste accumulation. Landfills like Banchare Danda near Kathmandu are overflowing with textile waste, causing respiratory illnesses, widespread crop damage, and contaminating water sources.

The appearance of fast fashion is also hurting the domestic garment industry of Nepal. This "sandwiching" effect is threatening the local economy and traditions associated with garment production and reuse.

The Nepalese government is trying to create anti-dumping laws similar to those of the European Union to prevent harmful imports. However, the 1,700-kilometer open border with India in 2024 has facilitated smuggling, which has been called a hotspot.

Social organizations are conducting river cleanups and promoting sustainable fashion awareness. Thrift stores and upcycling projects are helping to educate the public about sustainable consumption.

Fast fashion is destroying the traditional practice of recycling and reusing clothes. Kathmandu's main dump, Banchare Danda, is overflowing with textile waste, while toxic dyes are being released and synthetic fibers are decomposing, causing methane emissions and water pollution. This creates a threat to public health.

The consequences of this crisis have affected the country widely, drawing comparisons to the clash between traditional sustainable practices and the globalized fast fashion economy.

Photo: *HVAC System from rooftop*

Industrial HVAC technologies in 2025
In-depth insights

M A Mohiemen Tanim

Industrial HVAC systems are the backbone of modern factories, data centers, warehouses, and large-scale commercial facilities. In 2025, this sector is undergoing a profound transformation as companies, regulators, and end-users demand solutions that enhance energy efficiency, reduce emissions, optimize operational performance, and support digital integration.

Market Landscape and Growth

Robust Market Expansion

The global HVAC industry is experiencing significant growth, with the total market expected to reach $389.9 billion by 2029, up from $281.7 billion in 2024, representing a 6.7% CAGR. This expansion is fueled by:

» Urbanization and increased construction of industrial and

commercial buildings.

» Stringent energy regulations and policies are striving for carbon neutrality.

» Heightened awareness of sustainability and environmental impact.

» The need for resilient, adaptable systems arises from unpredictable weather and fluctuations in the global supply chain.

Impact of Regulatory and Environmental Pressures

Regulatory compliance is transforming the industry:

» The phase-out of high-global-warming-potential (GWP) refrigerants is mandated by international protocols, such as the Kigali Amendment.

» National and regional standards require the adoption of systems with improved energy performance, often favoring electrified heat pumps and integrated smart controls.

» Building owners face increasing economic and regulatory incentives to retrofit or replace legacy equipment with intelligent, eco-friendly alternatives.

Leading Industrial HVAC Technologies

1. Electrification and Heat Pump Technologies

Electrification—shifting away from fossil-fuel-powered HVAC systems—is a dominant trend. All-electric heat pumps and VRF (Variable Refrigerant Flow) systems are becoming the standard for new installations and major retrofits. Leading features:

» Precise Zoning: VRF and advanced heat pumps enable independent temperature control in multiple zones, addressing the distinct heating/cooling demands of expansive industrial sites.

» Superior Efficiency: Heat pumps extract heat from the air, water, or ground, consuming less energy than boilers or electric resistance heating. VRF systems adjust refrigerant flow with inverter-driven compressors, operating mostly at part load for maximum efficiency.

» Resilience and Application Flexibility: These systems are adapted for extreme climates ("all-climate VRF"), with applications expanding across manufacturing, logistics, and data-intensive sectors.

Notable Companies & Products:

» Daikin: VRV/VRF Systems with AI Smart Control—pioneers modular, scalable zoning in complex environments.

» Mitsubishi Electric: CITY MULTI VRF—offers broad capacity and enhanced digital control.

2. AI and Smart Control Integration

HVAC systems are now embedded with

AI and machine learning for dynamic optimization. Key benefits:

» **Predictive Maintenance:** Automated diagnostics and alerts reduce downtime, prolong equipment life, and decrease emergency repair costs.

» **Adaptive Energy Management:** Systems analyze occupancy, weather, and operational data, scheduling operation to minimize energy expenditures during peak pricing or low-occupancy periods.

» **Remote and Autonomous Operation:** Facilities managers can monitor, control, and reconfigure systems from anywhere, streamlining management across multiple sites.

Industry Leaders:

» **Johnson Controls (Metasys, OpenBlue):** End-to-end management platforms with real-time analytics and optimization.

» **Honeywell (Forge for Buildings):** Unified management of HVAC, lighting, and security with ML-based performance tracking.

» **Trane (Tracer SC+):** Combines building automation with sophisticated predictive controls.

» **BrainBox AI:** Offers AI retrofits for existing units, delivering significant savings without the need for full system replacement.

3. Eco-Friendly Refrigerants

Stringent environmental regulations are catalyzing the transition to low- or zero-GWP refrigerants. Highlights:

» **Regulatory Mandates:** The global phase-out of legacy HFCs is accelerating, with new models using natural refrigerants (CO_2, ammonia, propane) or advanced HFO blends.

» **Efficiency and Life-Cycle Cost:** Many eco-refrigerants require redesigns, but yield higher performance, less leakage, and future-proofing against regulatory changes.

» **Product Leadership:** Major OEMs are launching entire product lines using R-32, R-454B, or CO_2, ensuring continued access to international markets.

4. Geothermal and Advanced Dehumidification

Geothermal HVAC

Industrial geothermal systems, once the preserve of large energy users, can now be deployed more widely:

» **Stable, Low-Carbon Operation:** Ground-source heat pumps leverage the earth's constant temperature to deliver heating/cooling with up to 50% less energy usage versus air-sourced systems.

» **Decentralized Application:** Compact, modular systems fit smaller and mid-sized facilities, helping operators avoid local grid constraints.

Advanced Dehumidification

» **Process-Critical Humidity Control:**

Modern dehumidification—using desiccant wheels, membrane separation, or innovative materials like metal-organic frameworks—reduces humidity management costs by up to 90%, critical for food processing, pharma, and advanced manufacturing.

5. Smart Zoning, Building Integration, and Wellness

Modern industrial HVAC now operates as part of intelligent building ecosystems. Key aspects:

» **Smart Zoning:** Sensors and actuators dynamically direct heating/cooling precisely where needed, avoiding over-conditioning of unused areas.

» **Integration with BMS/IoT:** Advanced systems plug into Building Management Systems (BMS), alongside lighting, security, fire protection, and access control, for holistic facility management.

» **Occupant Health:** Air purification, monitored ventilation, and wellness algorithms ensure regulatory compliance (e.g., ASHRAE Standard 62.1) and protect workers in high-activity environments.

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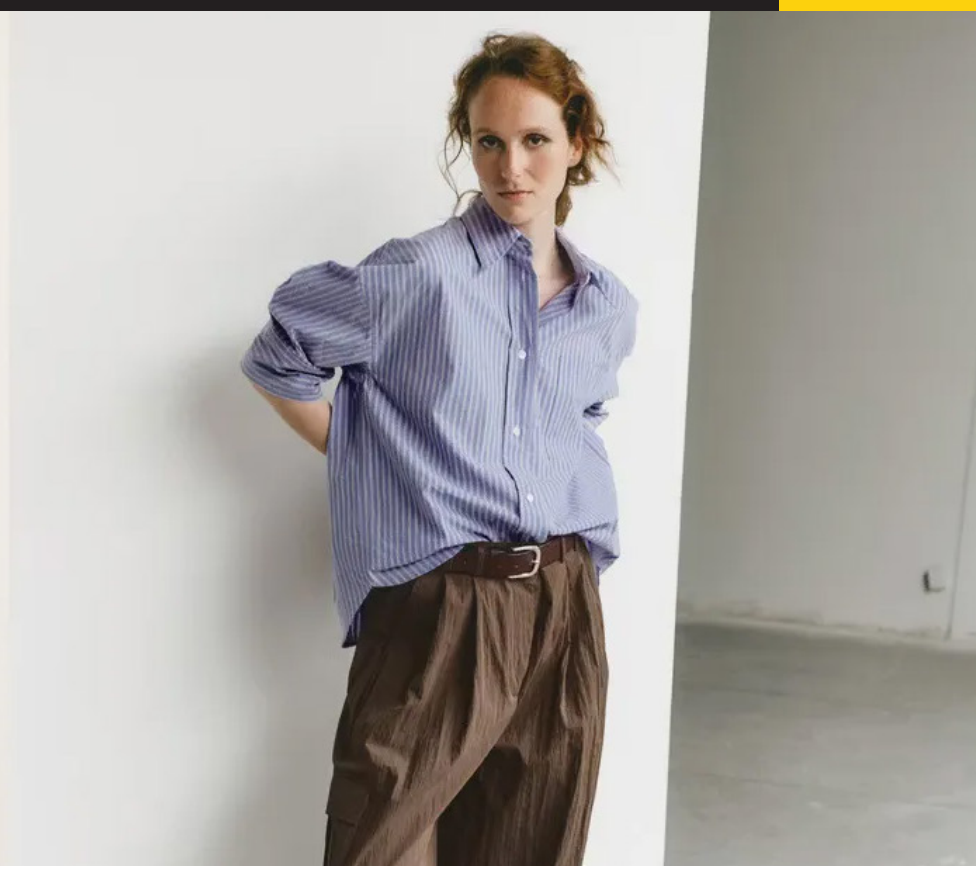
Comparative Insights: Companies & Products

Company	Key Products	Specialty Features	Industrial Application
Johnson Controls	Metasys, OpenBlue	AI/IoT integration, predictive management	Smart factories, warehouses
Siemens	Desigo CC	BMS, energy forecasting, holistic integration	Multi-site operations, data centers
Honeywell	Forge for Buildings	Data-driven maintenance, adaptive zoning	Health care, education, large campuses
Daikin	VRV/VRF w/ AI Control	Zoning, real-time system optimization	Manufacturing, logistics, cold storage
Carrier	Abound	IoT, predictive analytics, diagnostics	Clean rooms, pharma, critical process
BrainBox AI	AI HVAC Retrofit Platform	Autonomous optimization for legacy equipment	Industrial campuses, existing factories
Trane Technologies	Tracer SC+	Integrated building automation, fault detection	All-scale facilities, industrial parks



ZENGGI Spring/Summer 2026: embracing soft power through nature-inspired design

Mohammad Mithun

Amid a world driven by fast-paced trends and constant clamor, ZENGGI distinguishes itself through a quiet resilience, an unwavering brand identity rooted in the rhythms, textures, and enduring grace of the natural world. The Spring Summer 2026 collection is a continuation of this narrative, a masterful balance of enduring elegance and contemporary insight. Gentle by nature and refined in expression, ZENGGI once again proves that authenticity lies in subtlety and that softness is its own kind of power.

An Evolving Signature

ZENGGI has built a reputation on intelligent, outspoken minimalism that flows seamlessly from season to season. Rather than abrupt reinvention, each collection is an evolution, a renewal aligned with the shifting elements of time, yet always true to its essence. The Spring Summer 2026 collection reflects this ethos with remarkable clarity. Masculine structures are reimagined through a feminine lens, bold yet nuanced, sturdy yet serene.

The Spirit of the Season

The silhouettes this season are long, generous, and inherently airy, crafted to allow the body to move freely and confidently through life. Soft curving lines and discreet hints at the waist imbue each piece with a quiet romance. Though the mood is gentle, it is grounded in functionality, drawing inspiration from the cool rigor of workwear.

Nature remains at the heart of ZENGGI's palette and material choices. The subdued base tones blues, browns, whites, greens, and powdery pinks are brought to life with restrained pops of joyful color, reminiscent of flowers blooming in wild, untamed fields.

Technical Craft Meets Organic Beauty

Innovation meets nature in the technical fabrications of the collection. A feather-light silk-nylon blend with a mossy texture breathes life into wide pleated trousers and a collarless blouse with languid, subtly rounded lines. Meanwhile, a cotton-nylon blend with a bark-like texture transforms into an ankle-length shirt dress and a long, wide skirt, or cargo-pocketed pleated trousers pieces that blend outdoor resilience with a natural softness.

Stripes appear in refreshing ways, including a standout café au lait brown with white and blue that subtly contrasts with a finely crinkled viscose-nylon-cotton blend. This material forms the basis of roomy trousers, blouses, and a maxi shirtdress, offering comfort without compromise. A sleeveless top in delicate tape yarn and a breezy crewneck in heathered black paper yarn add unexpected tactility to ZENGGI's knitwear lineup.

Photo: *© ZENGGI*

The Knitwear Narrative

Knitwear is always a strength for ZENGGI, and Spring Summer 2026 continues the tradition with luxurious understatement. Featherlight summer merino tees come in oversized silhouettes, while 100% cashmere and wool-cashmere blends deliver unparalleled softness in delicate forms. Even fabrics with a unisex edge retain a soothing, skin-friendly quality be it dark denim for a generous pleated jean and long top, or blue chambray reimagined into a long kaftan dress with coordinating cargo trousers.

Photo: *© ZENGGI*

In cotton khaki twill, utility and beauty intertwine. A wide worker jacket, matching trousers, and a long half-circle skirt—all carefully finished with unbleached cotton reflect ZENGGI's meticulous craftsmanship and commitment to honest materiality.

ZENGGI's garments are not about commanding attention, but rather inviting a second, more thoughtful glance. The clothing respects the female form, offering space rather than restriction long lines, roomy cuts, and delicate nips at the waist in blazers, sleek dresses, and tops that speak to the powerful interplay between strength and softness. Curved seams in trousers and blouses add movement and grace, a nod to femininity that is neither performative nor diminished.

With Spring Summer 2026, ZENGGI presents a collection that is timeless yet utterly contemporary. It is a quiet revolution, a reminder that gentleness when shaped with intelligence and care can move the world.

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