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Smart/Biosensor Underwear Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Application (Sports and Fitness, Medical Monitoring, Others), By Material (Cotton, Merino Wool, Bamboo Fabric, Others), By End User (Men, Women, Kids), By Distribution Channel (Online, Offline), By Region & Competition, 2021-2031F

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Abstracts

The Global Smart and Biosensor Underwear Market is projected to expand from USD 727.27 Million in 2025 to USD 1239.31 Million by 2031, reflecting a compound annual growth rate of 9.29%. This sector involves intimate apparel embedded with wireless transmitters, conductive fibers, and flexible sensors capable of tracking physiological data like moisture levels, muscle activity, and heart rate. Growth is largely propelled by the rising global need for continuous remote patient monitoring and the increasing demand for dignified incontinence solutions among aging demographics. These factors are bolstered by industry-wide efforts toward standardization to guarantee product dependability; for instance, IPC International Inc. released the IPC-8981 standard and 14 associated test methods in 2025 to define quality benchmarks for e-textile wearables.

Despite this progress, the market faces a major obstacle regarding the technical difficulty of maintaining the long-term durability of embedded electronics. The complex manufacturing processes needed to shield delicate sensors during repeated laundering often lead to elevated production costs and the risk of performance deterioration over time. These issues create a significant hurdle to achieving mass consumer adoption and scalability within the industry.

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Market Driver

The rising global incidence of urinary incontinence and chronic diseases serves as a primary engine for the uptake of smart and biosensor underwear. These wearable technologies provide non-invasive means to manage long-term conditions by monitoring moisture levels and physiological metrics directly from the skin. Such garments are especially beneficial for patients needing continuous observation without the intrusion of conventional medical equipment or the stigma of visible devices. This strong economic demand for advanced hygiene and monitoring solutions was highlighted by Essity in January 2025; in their 'Report for quarter 4 and full-year 2024,' the company announced a record net profit of SEK 20.3 billion, attributed largely to the success of its Incontinence Products category.

Concurrently, the growth of telehealth infrastructures and remote patient monitoring (RPM) creates a vital ecosystem for scaling these connected textiles. As healthcare models shift toward home-based care, there is a surging requirement for reliable patient-generated data, encouraging the use of medical-grade wearables that connect with wider diagnostic systems. This trend was solidified in March 2025, when Drug Delivery Business reported in 'Nanowear enters CGM licensing, data partnership with Dexcom' that Nanowear partnered to incorporate continuous glucose monitoring data into its AI-driven undergarment platform for chronic metabolic management. Furthermore, federal interest supports this technological evolution; the U.S. Army allocated a maximum of $1.5 million per award in March 2025 through the solicitation 'Army SBIR|STTR launches $1.5M wearable explosive monitoring funding opportunity,' validating the strategic value of durable body-worn sensor technologies.

Market Challenge

The principal constraint limiting the Global Smart and Biosensor Underwear Market is the technical complexity involved in guaranteeing the long-term resilience of embedded electronics, which drives up production costs and restricts scalability. In contrast to standard textiles, these garments must endure the chemical exposure, moisture, and mechanical stress of repeated laundering without impairing the function of delicate biosensors. This necessity compels manufacturers to use specialized conductive materials and costly encapsulation methods, pushing retail prices beyond what average consumers are willing to pay. As a result, the market remains specialized, with potential buyers reluctant to purchase expensive intimate apparel that may suffer performance degradation after routine washing.

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The magnitude of this manufacturing obstacle is evident in the extensive industry efforts currently underway to establish reliable engineering standards and resolve fragility concerns. According to the International Electrotechnical Commission (IEC), Technical Committee 124 was managing 18 distinct working projects in 2024 focused on standardizing wearable electronic technologies. This substantial volume of structural work underscores the developing nature of the technology, where research and development costs remain high. Until these technical durability challenges are overcome to enable cost-efficient mass production, smart underwear adoption will likely be confined to specialized medical applications rather than achieving widespread commercial availability.

Market Trends

The shift toward Femtech and Reproductive Health Monitoring is transforming the industry by emphasizing gender-specific physiological tracking over general fitness data. Unlike standard wearables, smart intimate apparel is uniquely capable of monitoring menopausal symptoms, menstrual cycles, and fertility windows using non-invasive, textile-based sensors that ensure continuous skin contact. This trend fills a significant gap in women's healthcare by providing dignified, hardware-free monitoring options that blend seamlessly into everyday routines. Highlighting the commercial viability of this sector, Two Small Fish Ventures announced in March 2025, under 'Investing in Fibra,' that it had strategically funded a startup creating smart underwear designed to automatically analyze and track essential reproductive health biomarkers without requiring user intervention.

Simultaneously, the integration of Stretchable and Washable Electronic Textiles is addressing the crucial issues of user comfort and component durability. Manufacturers are transitioning away from attaching rigid sensors to clothing and are instead weaving computational abilities directly into the fabric structure, allowing undergarments to retain elasticity and withstand normal laundry cycles. This technological advancement enables 'invisible' computing, where the textile itself acts as both processor and sensor, significantly decreasing dependence on bulky external devices. In February 2025, MIT News reported in 'Fiber computer allows apparel to run apps' that researchers successfully demonstrated this potential by incorporating machine-washable fiber computers into leggings, which attained an activity recognition accuracy of nearly 95 percent while networked within the garment.

Key Market Players

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%li%Myant Inc.

%li%ALMA Smart Underwear

%li%Carin

%li%Urifoon B.V.

%li%Dryly B.V.

%li%Enuresis Solutions, LLC

%li%Pjama AB

%li%Be-A Japan Co., Ltd.

%li%ZOOKEE s.r.o.

%li%Chatzianastasiou Ch & Co.

Report Scope

In this report, the Global Smart and Biosensor Underwear Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

%li%Smart and Biosensor Underwear Market, By Application

%li%%li%Sports and Fitness

%li%%li%Medical Monitoring

%li%%li%Others

%li%Smart and Biosensor Underwear Market, By Material

%li%%li%Cotton

%li%%li%Merino Wool

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%li%%li%Bamboo Fabric

%li%%li%Others

%li%Smart and Biosensor Underwear Market, By End User

%li%%li%Men

%li%%li%Women

%li%%li%Kids

%li%Smart and Biosensor Underwear Market, By Distribution Channel

%li%%li%Online

%li%%li%Offline

%li%Smart and Biosensor Underwear Market, By Region

%li%%li%North America

%li%%li%%li%United States

%li%%li%%li%Canada

%li%%li%%li%Mexico

%li%%li%Europe

%li%%li%%li%France

%li%%li%%li%United Kingdom

%li%%li%%li%Italy

%li%%li%%li%Germany

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%li%%li%%li%Spain

%li%%li%Asia Pacific

%li%%li%%li%China

%li%%li%%li%India

%li%%li%%li%Japan

%li%%li%%li%Australia

%li%%li%%li%South Korea

%li%%li%South America

%li%%li%%li%Brazil

%li%%li%%li%Argentina

%li%%li%%li%Colombia

%li%%li%Middle East & Africa

%li%%li%%li%South Africa

%li%%li%%li%Saudi Arabia

%li%%li%%li%UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Smart and Biosensor Underwear Market.

Available Customizations:

Global Smart and Biosensor Underwear Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The

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following customization options are available for the report:

Company Information

%li%Detailed analysis and profiling of additional market players (up to five).

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