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Smart Textile Connector

Standardized connector for future e-textiles

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Smart Textile Connector



Challenges:

- Integration of electronics in textiles has evolved organically, with each manufacturer bearing the full cost of developing all components. The current lack of standards for common solutions has resulted in a scattered supply chain, high development costs and long time to market for new products.

Market needs:

- An industry standard for connectivity in e-textile applications:
 - Development of a range of standardized and interoperable components > Cheaper development costs/higher value products and faster time to market for e-textiles
 - Interoperability between technology generations and application domains
 - Increased attractiveness of investment in development of components for e-textiles > mature supply chain
 - Development of recycling /reuse capabilities to fulfil commitments to the EU Strategy for Sustainable and Circular Textiles and maximise sustainability

Objectives:

- **Develop a universal connector for e-textiles, that will form the basis for a voluntary industry standard, pave the way for development of interoperable components and standardized labelling, recycling/reuse solutions and a fully integrated supply chain for e-textile products.**

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Technical goals:

- Development of a waterproof universal connector
- Development of a power-efficient connectivity solution
- Accommodate variations in circuit configuration and fabric properties through bonding layers
- Designed for reuse/recycling at end of product life
- Develop high-precision mechanised large scale mounting process

A universal Textile Connector needs to withstand exposure to UV-light, rain, dirt and dust, and even washing while being easily mountable on soft, flexible and stretchable fabrics, provide robust support at the interface between fabric and housing as well as being cheap to manufacture and comfortable (unobtrusive) to wear.



Washable connector for wearables,
now discontinued

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Value created:

- Community building, fully developed and integrated supply chain (through plug-and-play solutions and assurance of component interoperability)
- European leadership in development of smart textiles standards and labelling
- Increase attractiveness of investment in component development by increasing potential customers and offering opportunities for larger production runs
- Development of recycling /reuse capabilities to maximise sustainability



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**INTEROPERABILITY
SUSTAINABILITY**

HANDLING & CARE

Labelling standards for wash care, laundry chemicals, end-of-life and recycling

HARDWARE & SOFTWARE

Wearable processing platform for sensing applications and IOT services. Standardized connection interfaces and power supply.

ELECTRONIC CONNECTORS

Washable connectors suitable for cloth; standardized slides and docking units.

FIBRES & FABRICS

Conductive fibers and sensing / circuitry fabrics. Interposer layer for washable connectors & standards for near field power and communication transfer to IOT layer.

Smart Textile Connector: Partners



TEXTILE PARTNERS:

Smart Textile Alliance:

Industry consultation & requirement definition

Smart Fabric Inks Ltd/University of Southampton:

Bonding layer & compliance tests

Smart wearable manufacturer: (TBC)

Requirements, implementation & evaluation

Outdoor use E-textile manufacturer: (TBC)

Requirements, implementation & evaluation

Design Research Institute:

Exploring approaches to design for end-of-life sustainability

Textile recycling company: (TBC)

End-of-life specs. & process development of recycling processes

Association for Textile care labelling: (TBC)

Labelling standard for e-textiles

Machine manufacturer:

Equipment for high volume mechanised connector mounting

ECS PARTNERS:

Connector manufacturer:

Mechanical design, scalable manufacturing and mounting processes

Chip manufacturer:

Chip design, manufacture & test

Electronics recycling company:

Processes for recycling of electronic components from e-textile products

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Market opportunity:

- The global e-textiles market is estimated to have a value of between USD 2.88 and 3.74 Bn in 2024 with CAGR of 8.1% - 23.4% forecast for the period up to 2030. This potential for growth is driven especially by the demand for smart and connected clothing, the widespread expansion of IoT in consumer products and advancements in energy harvesting fabrics.
- The US government also recognises the potential of the sector and invested USD 317 million in AFFOA, a public-private partnership to build up the Smart Textile industry in the USA.

Creation of a consensual standard and efficient supply chain is essential to allow the European market to play a leading role in this revolutionary shift within the textile industry.

References:

Coherent Market Insights: Global E-Textiles Market Size and Share Analysis – Growth Trends and Forecasts (2024-2031)

Global News Wire: Smart Fabrics Markets and Global Strategic Business Report, 2024-2030

Market Data Forecast: Market Data Forecast: Global E-Textiles & Smart Clothing Market Size (2024 to 2029)



DRIVERS	Fitness and Health Monitoring
	Expansion of IoT in consumer products
	Advances in energy harvesting & thermoelectricity
	Automotive Apps. for enhanced passenger experience
CONSTRAINTS	Electronics miniaturization & washability
	High cost of products
	Fragmented supply chain
OPPORTUNITIES	Advancements in flexible circuitry & wireless connectivity
	Consensual industry standards > interoperability of components