

GS1 case study

Behind the seams: Digital insights in socks

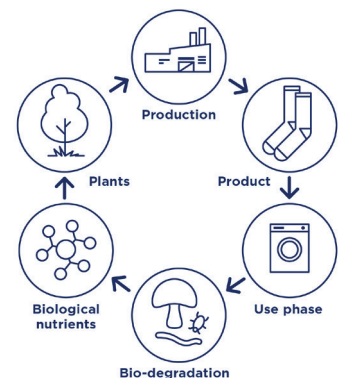
How a pilot project brought the Digital Product Passport to life



The European Union's Regulation on Ecodesign for Sustainable Products¹ (ESPR) is set to reshape the way physical goods are designed, made and consumed. Covering a range of physical goods categories, the regulation aims to make products more durable, circular and energy-efficient across their entire lifecycle.

At the heart of this initiative is the Digital Product Passport (DPP): a digital record that contains detailed information about a product. It serves as a digital identity for the product, offering traceability and transparency throughout its lifecycle—from design to disposal—by making key information about materials, production and environmental impact digitally accessible.

To see how this could work in practice, a pilot was launched to test the concept on an unexpected but essential item: socks.



1 - Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on making sustainable products the norm. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0140&qid=1649112555090>

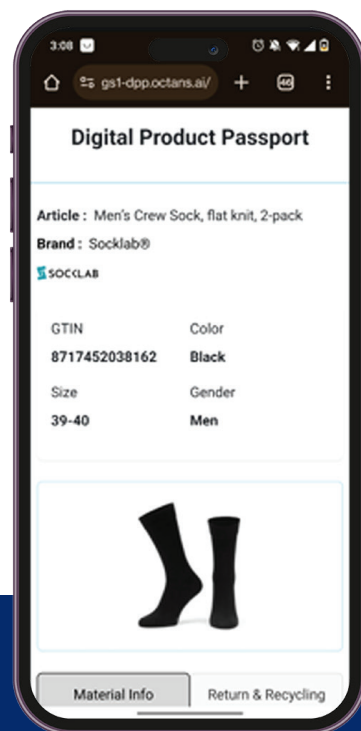
A simple product with big potential

The project was developed for SockLab®'s biodegradable socks and driven by Interloop, the world's largest sock and underwear manufacturer based in Pakistan. Producing up to 9 million pairs of socks annually, Interloop supplies major global and local brands—and has also been leading innovation in sustainable textiles.

SockLab® has introduced one of their latest innovations focused on sustainability: a sock made entirely from certified biodegradable materials. Recognising the environmental impact of textile waste, SockLab® set out to create a fully circular product—from cotton sourcing to end-of-life biodegradation.

With a vertically integrated supply chain, Interloop could trace every stage of production in-house. This made it the perfect test case to explore how the Digital Product Passport could work in real-world manufacturing.

And that's when GS1 standards came into play, as GS1 Pakistan and GS1 Netherlands joined Interloop to take on this exciting challenge together, bringing the power of global standards into life.

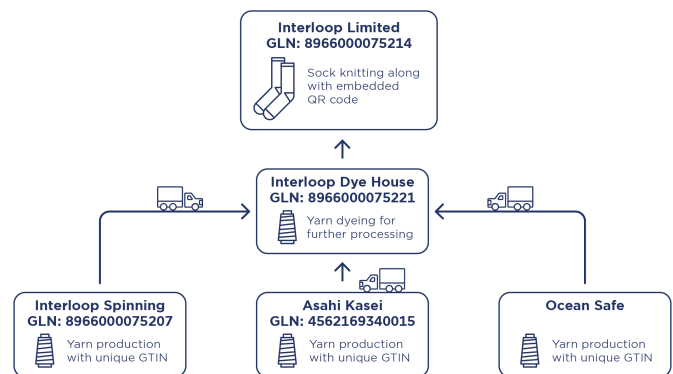


QR Codes powered by GS1 let consumers and stakeholders scan and access the full journey of a product, thanks to the 'power' of GS1 Digital Link – connecting to various online sources of product information.

From socks to standards: Traceability in action

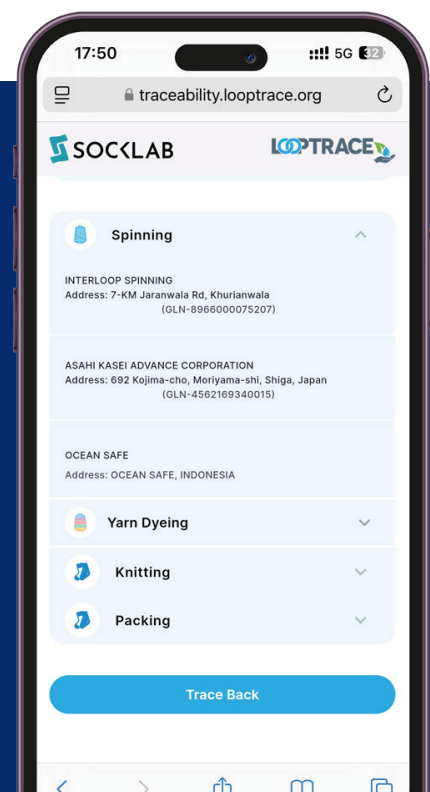
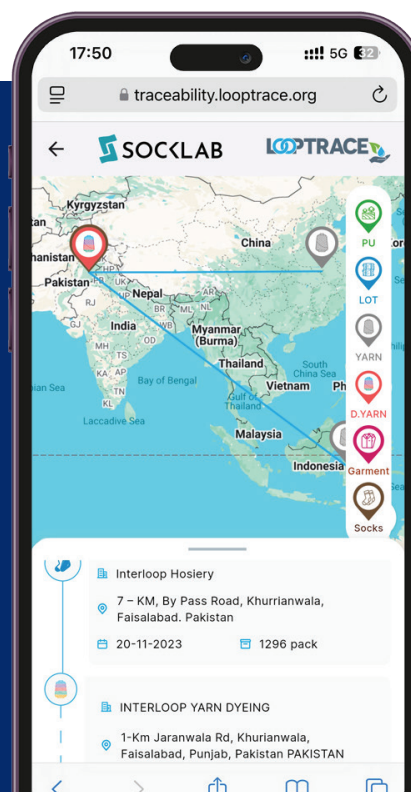
The pilot used key GS1 standards to bring traceability to life:

- Each pair of socks was assigned a GTIN® (Global Trade Item Number®) and marked with a QR Code powered by GS1, woven directly onto the fabric. Three types of QR Code labels were tested on the socks: heat-transfer, knitted and woven. The final choice—a woven label with an attached QR Code—proved to be the most durable and easy to scan.
- Production locations and suppliers were identified using GLNs (Global Location Numbers).



The socks were made from 98% cotton, sourced from Interloop's own production facilities in Pakistan, and 2% biodegradable elastane, supplied by partners in Indonesia and Japan—highlighting the global complexity behind even the simplest products.

All traceability data was captured in Looptrace, a solution developed by Interloop's tech team. From material sourcing to the finished product, each step was documented and linked to the product's QR Code, giving direct access to its Digital Product Passport.



Key takeaways

This pilot project provided valuable takeaways that can guide the future of DPPs across industries:

- **Everyday products can go digital**

Even simple, low-cost items like socks can carry a scannable QR Code powered by GS1 that links to a full product history, proving that traceability is scalable.

- **Collaboration creates momentum**

The success of this pilot was built on partnerships—between SockLab®, Interloop, Looptrace and GS1 Member Organisations. GS1 Netherlands and GS1 Pakistan worked closely together to coordinate the implementation with suppliers and partners. It showed how cross-border, cross-sector cooperation is essential to building global traceability ecosystems.

- **Local production, global relevance**

While the ESPR is a European Union regulation, its success depends on collaboration with production countries like Pakistan. This pilot showed how DPPs can support shared goals for sustainability worldwide.

- **Traceability supports circularity**

The biodegradable sock isn't just a product—it is a model for circular design, where traceability enables smarter material choices, end-of-life planning and more sustainable consumption.

- **Transparency builds trust**

With one scan of a QR Code powered by GS1, consumers can see where and how their socks were made. That level of transparency builds confidence and helps people make more informed, responsible choices.

A step forward for sustainable products

The sock pilot proved that with global standards, partnerships and collaboration, even the most everyday products can carry a digital story, showing how they were made, what they are made of and how they support sustainability and encourage circularity.

As the EU prepares to implement the ESPR and the DPP—with textiles among the first product categories covered—projects like this demonstrate how regulation can be brought to life and compliance monitoring strengthened.

How GS1 standards power trust and confidence

GS1 standards enable global traceability by supporting the trusted sharing of information between systems and stakeholders and ensuring seamless interoperability.

GS1's unique identifiers, such as Global Trade Item Numbers (GTINs) and Global Location Numbers (GLNs), enable tracing of products and locations across the supply chain.

QR Codes powered by GS1 can connect each product's unique identity to trusted online information using GS1 Digital Link. Based on the product and business needs, they carry essential data such as GTINs, batch or lot numbers, serial numbers, expiry dates and more, and scan at checkout.

By linking to online content, they can provide consumers and stakeholders with access to trusted information from the brand or retailer—such as product details, certifications, care instructions, sustainability credentials, and more—all with a simple smartphone scan.

At the same time, they can help to improve transparency and traceability throughout the supply chain—helping businesses comply with regulations, improve inventory management, reduce waste and enable circular business models.

QR Codes powered by GS1 can be scanned at the point of sale by retailers who have upgraded their systems to scan and read them.



About Interloop



Interloop Limited, a publicly listed textile manufacturer headquartered in Faisalabad, Pakistan, was founded in 1992 and is part of the KSE 100 index. Originally a B2B socks and leggings producer, it has grown into a vertically integrated, full-family clothing supplier, offering hosiery, denim, knitted apparel, seamless activewear and yarns for global brands like Nike, adidas, H&M and Levi's. With over 34,000 employees across Pakistan, Sri Lanka, Bangladesh, and China, Interloop runs multiple manufacturing plants, including a LEED-platinum denim factory and a newly opened knitted apparel plant in Faisalabad. The company is a leader in sustainable manufacturing, recycling 60% of its water, generating solar power (12.6 MW capacity) and reducing over 29,000 tonnes of CO₂e through SBTi-approved targets. In 2023, Interloop Europe and its R&D team developed the world's first 100% biodegradable sock collection, certified Cradle to Cradle Gold™.

About Socklab®

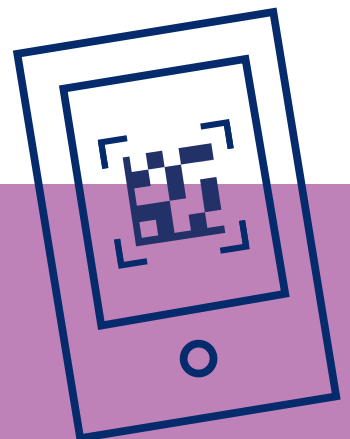


Socklab® is the flagship sustainable sock line from Interloop Europe, manufactured in Interloop's facilities in Pakistan, reflecting a strong commitment to environmental and social values. It is the world's first Cradle to Cradle Certified™ GOLD sock brand, ensuring all materials used are either biodegradable or fully reusable. The brand aligns with nine UN Sustainable Development Goals, promoting a triple bottom line of People, Planet and Prosperity. Socklab® incorporates eco-design principles throughout production, using biodegradable yarns, recyclable packaging and energy-efficient processes. In recognition of its innovation, Socklab® won the "Best Product" award in the ISPO TEXTRENDS Accessories category for Fall/Winter 2026-27. As a premium B2B brand, it delivers high-performance, eco-conscious socks with full traceability enabled by LoopTrace® technology.

About GS1

GS1 is a neutral not-for-profit organisation that develops and maintains the most widely used global standards for efficient business communication. We are best known for the barcode, named by the BBC as one of "the 50 things that made the world economy." GS1 standards improve the efficiency, safety and visibility of supply chains across physical and digital channels in 25 sectors. Our scale and reach—local Member Organisations in more than 110 countries, 2 million user companies and 10 billion transactions every day—help ensure that GS1 standards create a common language that supports systems and processes across the globe.

www.gs1.org



Get started with next generation barcodes!

Contact your GS1 Member Organisation to see how GS1 can help you begin your journey towards next generation barcodes!

www.gs1.org/contact

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