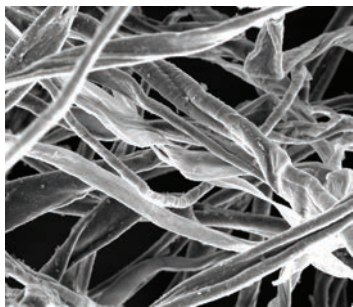


Cotton Traceability from Source to Retail using DNA-based Technology

Dr. Gediminas Mikutis, CTO Haelixa

WHY TRACE COTTON?



Due to complex supply chains, cotton is often under scrutiny as consumers demand to know who made their clothes and under which circumstances they have been produced. Additionally, governmental regulations that make manufacturers and brands accountable for sustainability standards and violations in their supply chains are on the rise. Transparency is routinely identified as the most effective tool for measuring impact and increasing accountability across supply chains. When looking at transparency of cotton supply chains, we have to start with traceability.

Chain of custody systems (ERP, certifications, blockchain) store information in a reliable way, but lack connection to the physical item itself. If fiber is mixed or exchanged at any one node, chain of custody won't be able to detect it.

DNA TRACEABILITY SOLUTION

Haelixa has developed and patented an innovative technology based on DNA to mark and trace cotton from farm to retail. DNA is engineered to withstand industrial textile processing such as bleaching, dyeing and textile finishing.



HOW IT WORKS

Haelixa creates a unique traceable fingerprint for a producer, mill, brand or even batch. The marker can be applied to the raw material or intermediate product and stays safely embedded in the product throughout the entire supply chain. By doing so, Haelixa turns the product itself into the carrier of the information about its origin and journey. It can then be verified in the final product or at any other stage in the supply chain, giving a forensic proof of the origin, authenticity and integrity of the product.

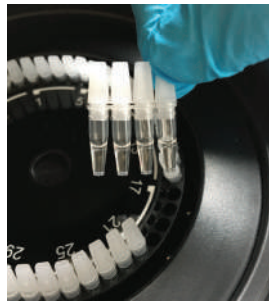
MARKING COTTON



A unique marker is dispersed in water and then applied as a spray at a farm, gin, spinning mill or another facility.

It is specifically engineered to stick to the fiber and stays safely embedded during the entire production up to the final garment.

VERIFICATION



The verification is done using a qPCR test. The technology works as a key-lock system that requires the knowledge of the DNA code to detect it. The results are then uploaded into an existing ERP system, blockchain or customized digital interface. Information about the origin of the product can also be shared with the end consumer using a QR code that leads to a dedicated website.

VALIDATED THROUGHOUT HARSH CONDITIONS

Haelixa's patented technology chemically protects DNA markers from harsh conditions. It has been proven to be applicable through all chemical and mechanical processing from farm to retail (and beyond through recycling).



GMO-FREE AND ORGANIC

- Not a genetically modified organism (GMO). Short DNA sequences do not encode for any genes and merely serve as fiber barcodes.
- GOTS approved input (No. GOTS-ECO-CERT-08-01262). Compliant with OCS.
- Non-toxic according to OECD 471 and OECD 487 tests.

NO CHANGE TO FIBER QUALITY AND PROPERTIES

- Added as a water dispersion in ppb (parts-per-billion) concentration. No other chemicals used. No heavy metals. Fiber quality is therefore not affected.
- No need to blend in additional fibers. Retain 100% cotton and original quality.
- Goods produced with Haelixa DNA are Oekotex Standard 100 compliant.

