LLA instruments
SCAN • SORT • SUSTAIN

Textile Sorting

SWIR technology in fibre-to-fibre recycling

Identify and separate pure natural fibres from their blends with synthetic fibres

SCAN • SORT • SUSTAIN

Why use SWIR technology in fibre-to-fibre recycling?

The demand for sustainable fashion is growing, whereas today more than 70 percent of non-reusable textiles are incinerated or are going into landfill.

What is hindering the successful implementation of fibre-to-fibre recycling?

In most cases, collected materials contain a mix of different fibres, impeding the emergence of new recycling processes for textiles. Obtaining information on the textile's fibre type and colour plays a key role in successful fibre-to fibre recycling.

SWIR sensors, such as hyperspectral cameras or multiplexed spectrometers, are ideally suitable for the identification and separation of pure natural fibres from their blends with synthetic fibres. The SWIR technology has been successfully used in the recycling industry, especially in polymer recycling, for many years.
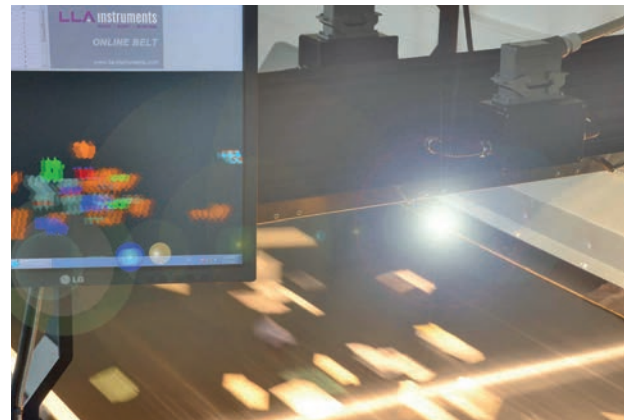
"Detect fibre type and colour quickly and easily with a complete plug-n-play solution on your belt!"

LLA Instruments SWIR sensor solutions are easily integrated into textile sorting machines

KUSTA-System

Hyperspectral Process Systems

Advantages

- Fast, real-time results

- High throughput with up to 800 Hz measurement speed

- Little to no sample preparation required

- Non-contact, non-destructive measurements

- Full material stream is monitored

- High spatial resolution enables detection of buttons, zippers, and embroideries
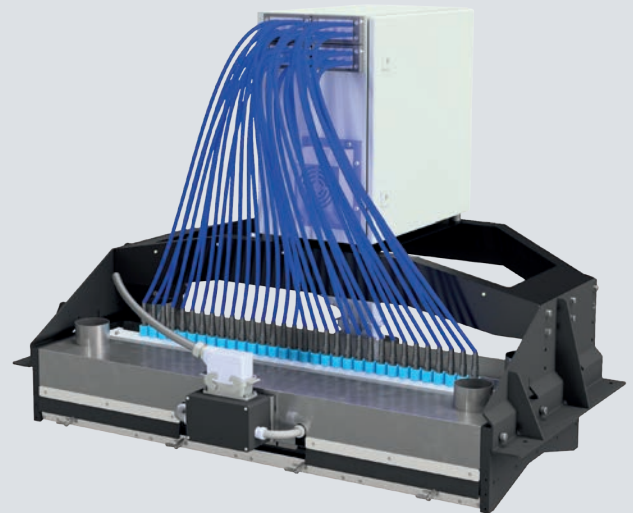
Our sensor-based system:

Includes pre-set control software, power supply, calibration tools, and illumination unit.

Can be further upgraded with RGB linescan cameras, motor-driven calibration, and ejection control.

Water, dust and dirt resistance components.

Operates seamlessly across a wide temperature range.

KUSTA-MPL

Multiplexed NIR Spectrometer

Advantages

- High resolution multiplexed spectrometer with fibre optic for non-contact detection

- Spectrograph with TE-cooled InGaAs linear sensor

- High scan rate up to 70 Hz enables identification and detection of material streams at belt speeds of up to 3 m/3

- Lower limit of detection of minor components in blends compared to SWIR HSI cameras

KUSTA-MPL spectrometers can:

Scan up to 64 tracks, detecting materials directly on or across multiple belts.

High spectral resolution of 4 nm/pixel for precise identification of minor components in blends (eg. PA-6 and PA-6.6).
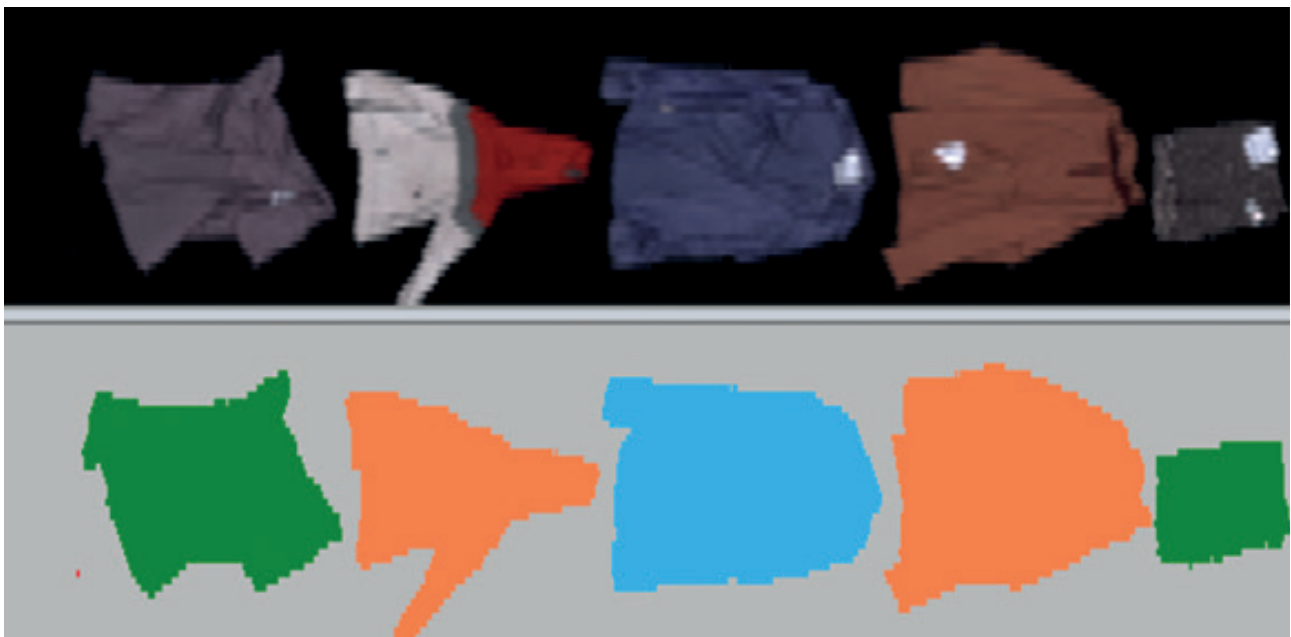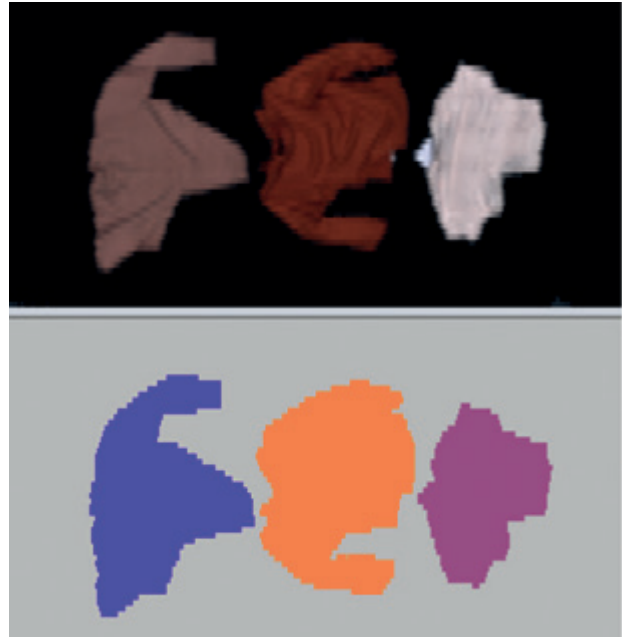
idFibre
Software Module

The application module **idFibre** is ideally suited for the identification of fibre types in textiles, and is available for the SWIR spectrometer **KUSTA-MPL** and SWIR hyperspectral **KUSTA-System**.

idFibre identifies all common pure fibre types, as well as blends such as Cotton+Polyester fibres. Even Cotton+Elastane blends are identified, enabling a reliable Elastane elimination as a prerequisite in fibre-to-fibre recycling.

KUSTA-System hyperspectral cameras are preferred in cases when buttons, small appliqués, or zippers must be detected.

KUSTA-MPL spectrometers feature PA-6 and PA-6.6 identification, and an integrated colour classification.

🟢 COTTON   🟠 COTTON + PE   🔵 VISCOSE + PE   🟣 COTTON + PA   🔵 WOOL

idFibre identifies the following fibre types in textiles:

- **Pure and modified natural fibres:**
  Cotton, Lyocell, Acetate, Viscose, Silk and Wool

- **Pure synthetic fibres:**
  Polyamide (Nylon), Acrylic, Polyester

Blend composition classes available for:

- **Blended fibres:**
  Cotton-Polyester, Cotton-Elastane, Polyester-Elastane, Cotton-Acrylic, Polyester-Acrylic, Wool blends, Silk Blends, Polyamide-Elastane, Acrylic Polyamide, Polyester Polyamide, Viscose-Elastane, Cotton-Polyester-Elastane

- **Cotton-Elastane blends:**
  In different categories according to their respective Elastane content

- **Polyester-Elastane blends:**
  In different categories according to their respective Elastane content

All fibre type classification results are combinable with colour information

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LLA instruments

scan

with hyperspectral and x-ray fluorescence
technology for precise material analysis

sort

with optical sensor-based systems
for fast, high-throughput processing

sustain

with flexible software programmes
to adapt to new material demands

**Contact us to find the optimal solution
for your application:**

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