Textechno
textile testing technology

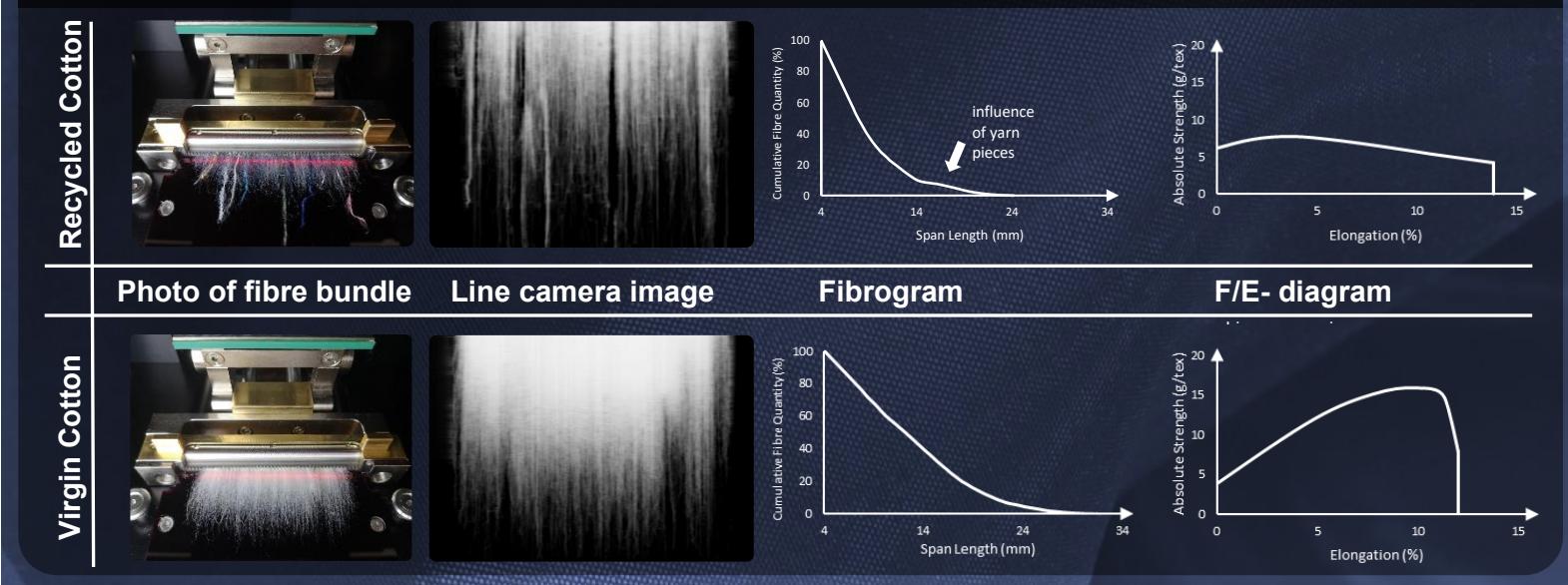
Testing Solutions for Recycled Fibres

Textile recycling is among the fastest growing textile sectors of the current decade. When garments are mechanically recycling back into fibres, various techniques can be applied, resulting in very different fibre properties. Knowledge of the properties of the recycled fibres are key for a high-quality end product. Fibre length distribution and contaminations, e.g., from yarn remnants, are among the most important quality parameters of recycled fibres.

When developing testers for the spun yarn market, Textechno paid close attention to the flexibility and versatility of the instruments. In several studies and by practical use the testers have proven to be well suited for fibres coming from recycling processes of all kinds. This includes fibres from post-industrial as well as post-consumer waste, regardless of material, colour or chemical treatment.

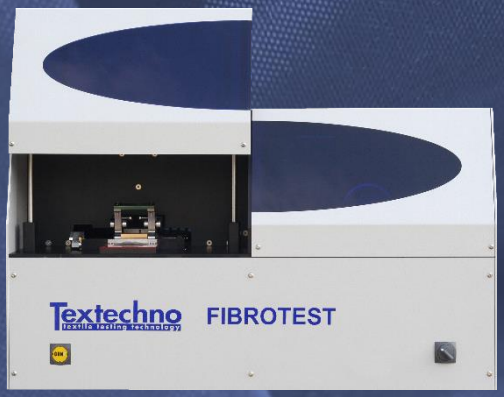
The below images and application examples give an overview of the various ways in which Textechno´s testing instrumentation can be used to characterize recycled fibres.

FIBROTEST: Comparison of recycled and virgin cotton samples



General FIBROTEST workflow:

- Creation of a fibre bundle using the preparation station
- Insertion of the clamped bundle into the tester
- Automatic test of length, strength and weight of the fibre bundle



FIBROTEST

This tester incorporates both, fibre length measurement and fibre-bundle strength test within one instrument. The sample mass is automatically determined, which enables calculating the exact and absolute value of the tenacity.

FIBROLENGTH

For those customers who are only interested in length-related values of FIBROTEST, Textechno offers FIBROLENGTH as cost-effective alternative.

How Textechno´s Instruments are used in the Recycling Fibre Industry

Determination of:

- Fibre length distribution (FIBROTEST/FIBROLENGTH/ MDTA 4); upper half mean length, uniformity index, short fibre index, etc. These are critical parameters for ensuring a trouble-free spinning process and a sufficient yarn quality
- Fibre bundle strength (FIBROTEST), absolute i.e. without calibration cotton; and relative to calibration cotton, if required (minimum UHML of 19 mm)
- Opening Work (MDTA 4), useful for comparing different chemical treatments or dyes

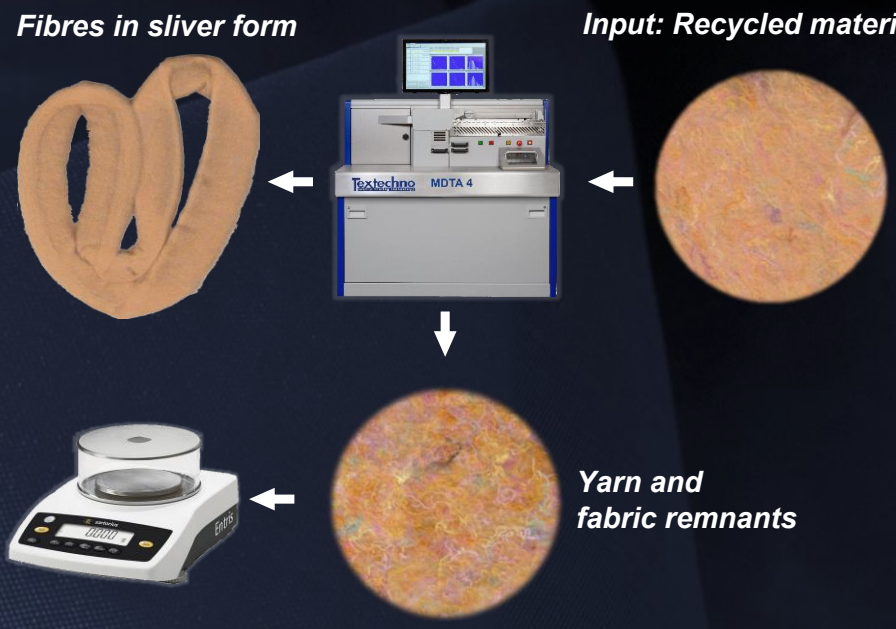
Quantification of impurities, especially of yarn remnants and neps using MDTA 4:

- Separation of yarn remnants
- Gravimetric measurement of the separated impurities

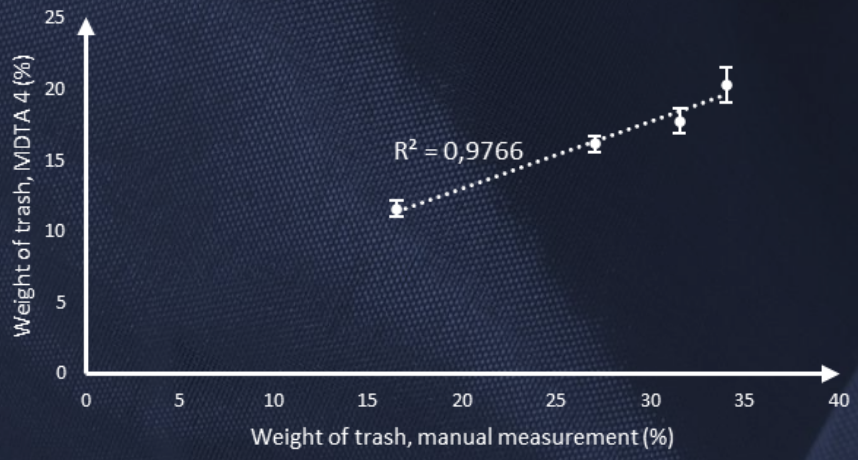
Creation of slivers with variable blending ratios by MDTA 4; the slivers can be used for:

- Optimization of sliver cohesion (STATIMAT), e.g., when blending recycled cotton with virgin cotton or synthetic fibres
- Colour inspection of blends
- Spinning trials

Separation of Fibres from Yarn and Fabric Remnants



Comparison of MDTA 4 measurements with manual measurements



4 types of recycled cotton were used:

*16,5 %**

*27,0 %**

*31,5 %**

*34,0 %**

*weight-percentage of yarn pieces according to manual measurements

- Very high correlation between MDTA 4 and manual measurements
- Very high reproducibility
- Time consumption per sample:
  MDTA 4 → 4 minutes
  Manual → 2 – 4 hours

Textechno´s Fibre Classifying System FCS consisting of:

FIBROTEST / OPTOTEST / FIBROFLOW

MDTA 4

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Textechno textile testing technology

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