

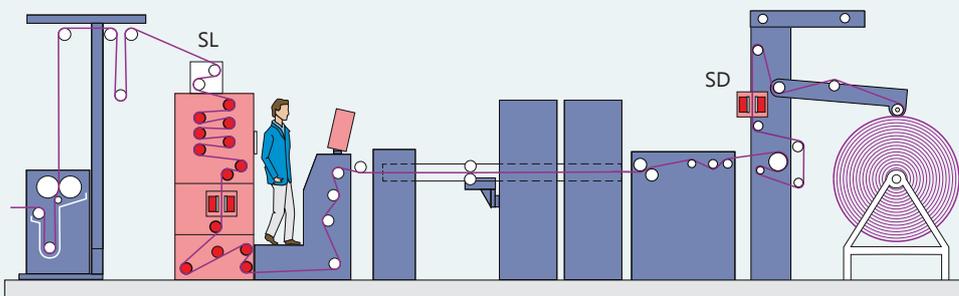
## High-tech Automatic Straightening Systems

**Straight  
Liner SL**  
Series 300



## Advanced Distortion Analysis, Width and Density Measurement

**Structure  
Detector SD**  
Series 300



**CAM system**

**CAM for distortion analysis and pick/course density**

Type CAM series 300

**FEATURES OF PRODUCT**

- "Self-tuning structure detection"
- Covered area calculation
- Picture of fabric on panel
- Infrared flash light
- Large area analysis with one picture
- Robust, compact system

**Technical features**

CAM is a smart camera and lighting system designed for the sophisticated structure analysis on any kind of textile.

- Image capturing in 0.00001 seconds
- Picture size standard: 40 x 30 mm
- Automatic brightness control
- Lightning-fast contact free scanning
- Reflected and transmitted light
- Colour-neutral infrared flash (>1000 watts)
- High-speed analysis >10 times a second
- Picture analysis independent of fabric speed



CAM series 300: fabric sensor, lens and LED front flash

**CAM systems for different applications**

With more than 20 years experience in high-tech camera analysis of textile fabrics, several solutions for previously insolvable tasks were achieved:

- **CAM Standard**, universal applicable from 1 to 75 picks/cm
- **CAM Automotive**, especially designed for dark fabrics, wavy patterns or laminated fabrics
- **CAM Denim**, designed for Denim fabric of any colour, even black Denim
- **CAM High-Density** for fabric with pick density from 5 to 350 picks/cm
- **CAM Individual** for special, customized applications

**CAM software**

**Unrivalled structure analysis with self-tuning detection**

**Self-tuning detection camera**

**BENEFIT FOR CUSTOMER**

- Maximum detection capability
- Smart image processing CAM
- High-precision distortion analysis
- Black Denim analysis
- Density measurement
- Transmission and reflection analysis

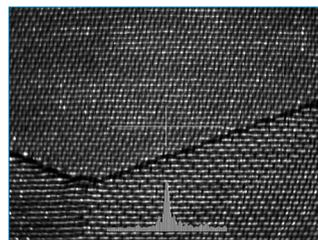
**Smart image processing**

- Universal, self-optimizing detection
- Horizontal distortion
- Horizontal density (picks / courses)
- Vertical density (warp / wales)
- Brightness control
- Area covered of fabric in percentage at technical fabrics (digital coverage)
- Picture of fabric on panel
- Advanced, self-made digital signal processing algorithms for angle detection and density

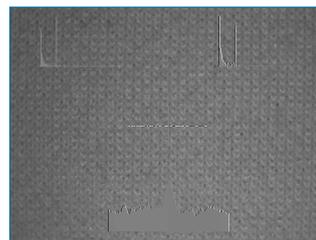
**Any structured textiles from 1 to 350 /cm**

- Africa damask
- Automotive seat fabrics (woven and warp knitted)
- Camouflage fabrics
- Complex „Jacquard“ fabric
- Corduroy
- Curtain
- Denim and overdyed black Denim fabrics
- Fantasy design
- Fiberglass fabric with low contrast
- Glass fibre fabrics for PCB
- High-quality fabrics for automotive industry
- Light and tension sensitive inlet fabrics (woven and raschel lace < 20 gsm)
- Loden fabrics
- Mattresses as knitted material and Jacquard
- Stripe satin
- Technical filter material
- Upholstery fabric
- Warp-knitted fabrics
- Weft-knitted fabrics
- ...and much more

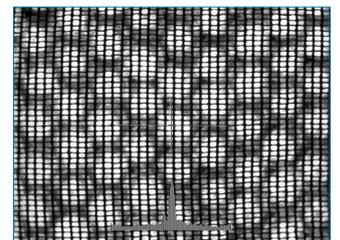
**CAM pictures with smart distortion angle and density analysis**



Jacquard woven fabric



Knitted fabric



Technical textiles

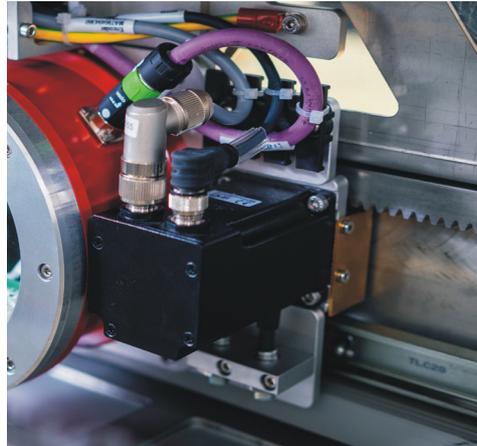
## Ingenious, maintenance-free traversing concept

### Technical features

- Robust stainless-steel construction
- Plug and play connectors
- Intelligent motor management
- Self-adjusting CAM and illumination trollies
- Double rail and double slider system

### Advantages of SD

- Accurate distortion measurement due to many measured values over fabric width (e.g. 40 measured values for 2000 mm fabric width) independent of fabric speed (even at stand-still)
- Measurement of distortion from the fabric edge
- Automatic width adjustment of the traversing range of the camera after fabric change
- Durable and robust high-speed traversing up to 150 cm/sec automatically
- Local distortion can be detected at any place across fabric width by rapidly traversing high-tech digital camera.



CAM with single drive on stainless steel gear rack

- Simple mounting into existing machinery
- Traversing speed can be adjusted to fabric width and fabric speed.



Structure Detector SD in stainless steel construction

## Structure detector SD

Type SD series 300

### FEATURES OF PRODUCT

- Ultra-robust high-speed traversing adjustable up to 150 cm/sec
- Made of stainless steel for the toughest environments
- Automatic traversing adjustment, no manual settings required
- Easy accessibility without any tools
- SD 1: with 1 CAM system
- SD 2: with 2 different CAM systems for special applications or back/face measurement

## Traversing speed can be adjusted to fabric width and speed

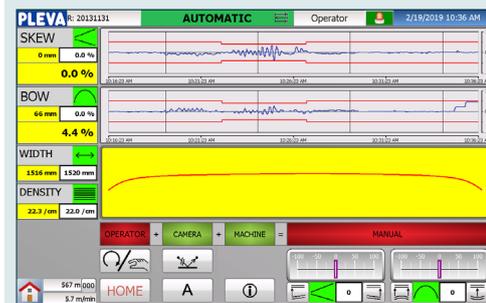
### Applications for SD

- Key part of high-tech straightening machine SL
- Inlet-Outlet-Systems SL-SD: Additional SD in the outlet provides:
  - Fine tuning of stripping roller
  - Final fabric density
  - DensityControl via overfeed (stenter) or belt pressure (shrinkage unit)
  - Preset of distortion for SL in the inlet
  - Comparison of fabric width and fabric density between inlet and outlet
- After Denim hotflue for measurement and con-

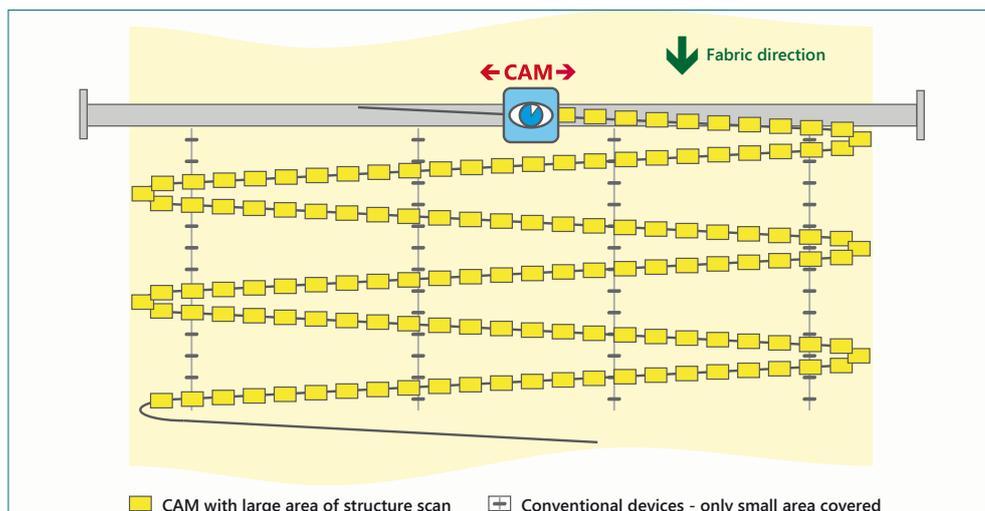
trolling of skewing, fabric width and density

- Used as detection and control system in straightening devices integrated in the inlet of stenter frames
- As inspection system after stenters, sanforizers, inspection tables, tube openers or before processes (e.g. printing machine, incoming goods inspection)
- An additional SD before straightening machine SL provides an advanced feed forward control for perfect straightening even at rapidly fast changing distortions.
- As control system for existing straightening units (e. g. carpet)

## Large area structure scan



Screen shows wavy distortion in the selvage area



Principle of the traversing CAM system compared to conventional devices

### BENEFIT FOR CUSTOMER

- Precise distortion analysis from selvage to selvage
- Large area structure scan
- Sectional distortions over the width
- Fabric width measurement
- Indication of fabric alignment

**Panels**

**High performance panel with new features**

Type PLEVATEC pro15

**FEATURES OF PRODUCT**

- Robust 15" HMI touch panel
- No cooling required up to 60° Celsius
- LAN, USB, SD card, OPC UA

**Technical features**

- 15" touch panel
- Protected up to 60° Celsius without cooling
- Flash disk for data history and programs
- Software on SD card
- Interfaces: OPC UA, USB for data exchange

Actual, set values and tolerance information for SKEW, BOW, WIDTH and DENSITY



- History SKEW
- History BOW
- Fabric distortion from edge to edge
- Control information

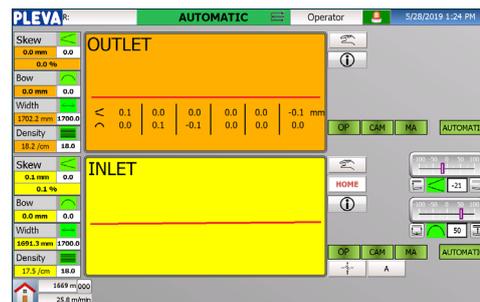
Panel PLEVATEC pro15: All values on a glance.

**Monitoring and Control**

**Process transparency**

**FEATURES OF PRODUCT**

- Display of distortions in % or mm/in
- Width in mm or in
- Density in 1/cm or 1/in
- Integration of additional controls: Fine tuning stripping roll DryControl DensityControl
- Highest accuracy



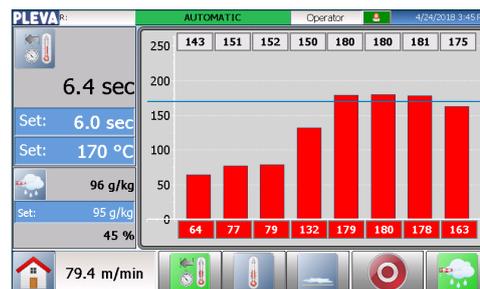
Screen shows Inlet-Outlet straightening system

**Inlet - Outlet**

High-tech automatic straightening systems with SL in the inlet and SD in the outlet of a stenter frame are displayed together on one screen.

All vital information is visible on one screen, and coloured symbols show if values are in (green) or out of tolerance (red),

Controls for both systems can be adjusted separately.



Screen shows DryControl

**SL with DryControl**

Additional controls like DryControl can be integrated into straightening systems.

All vital information is visible on one screen.

Controls for both systems can be adjusted separately.

## PLEVA straightener SL 1 for up to 2800 mm fabric width

### Technical Features

- PLC with safety modules
- Energy efficient electrical servo drives with precise positioning feedback signal for 3 skew rollers and 2 (3) bow rollers
- Distortion evaluation by integrated SD
- High-speed roller adjustment:  
Bow rollers 0 - 100% = < 2.5 sec  
Skew rollers 0 - 100% = < 2.2 sec
- Skew straightening:  
Effect in theory on maximum fabric width  
SL 1: ± 1200 mm
- Bow straightening:  
Effect in theory depending on maximum fabric width from 1600 mm to 2800 mm  
SL 1: ± 242 mm to ± 455 mm



StraightLiner type SL 1

## StraightLiner SL 1

Type SL 1

### FEATURES OF PRODUCT

- Maximum fabric width: 1600...2800 mm
- Automatic weft straightening machine for woven and knitted goods
- Shortest roller adjustment times for highest correction accuracy

## PLEVA straightener SL 2 reinforced for up to 5400 mm fabric width

### Technical Features

- PLC with safety modules
- Energy efficient electrical servo drives with precise positioning feedback signal for 3 skew rollers and 2 (3) bow rollers
- Distortion evaluation by integrated SD
- High-speed roller adjustment:  
Bow rollers 0 - 100% = < 2.5 sec  
Skew rollers 0 - 100% = < 2.2 sec
- Skew straightening:  
Effect in theory on maximum fabric width  
SL 2: ± 1700 mm
- Bow straightening:  
Effect in theory depending on maximum fabric width from 1800 mm to 5400 mm  
SL 2: from ± 277 mm to ± 921 mm



StraightLiner type SL 2 reinforced version with panel

## StraightLiner SL 2

Type SL 2

### FEATURES OF PRODUCT

- Maximum fabric width: 1800...5400 mm
- Automatic weft straightening machine in heavy-duty edition
- Best solution for: Denim, technical fabrics
- Special execution for glass fibre fabrics

## Main features of SL and SD series 300

### Technical Features

- Precise calculation of distortion due to a very large number of measuring points across the fabric width (every 5 cm a picture of 4 cm width)
- Accurate correction of skew and bow distortion due to many measuring points (up to 36 measuring points from selvage to selvage at a fabric width of 1.80 m).
- Remaining small distortions after the straightening machine will be symmetric to zero and thus will be corrected automatically by tensing in the inlet of stenter frame.
- Sophisticated cascade control algorithm takes width and fabric speed into account.
- Improved control algorithms can be adjusted in 3 levels (calm, normal, fast).
- Measuring mode is continuously optimized (e.g. when fabric is straight, angle is narrowed for more measuring points).
- Screenshots from visualization
- Interfaces from OPC UA to Profinet
- Remote control and maintenance package
- Single-sided SD R (reflection measurement only)

PLEVA straightener SL special solutions

**Special versions**

- Precision straightening of residual distortions with 2 skew rollers and 1 bow roller: SL 1P, SL 2P
- A second straightening unit allows to double the straightening effect: SL X
- Special PLEVA straightener version for carpet: SL C

**BENEFIT FOR CUSTOMER**

- Modular design
- Custom-made version



SL 2X: Narrow fabric on SL for wide fabrics



SL C: Modular straightening system for carpets

- Feedforward control: An additional SD before the SL allows advanced feed forward control for perfect straightening even at rapidly fast changing distortions.
- Special rollers with high concentricity accuracy with diameter up to 210 mm for SL 2

**Add-Ons**

**Additional features**

**Fabric tension control for tension sensitive and knitted fabrics**

- Control of fabric tension by driven bow rollers
- All bow rollers (up to 3) are driven
- Fabric tension adjustable by compact compensator with pneumatic unit or by load-cell

**Adjustable expanding device in front of StraightLiner**

- Decurling device, especially for knitwear
- Enlacement adjustable

**DryControl**

- Integrated modules for DryControl
- Fabric and air temperature TDS
- Exhaust humidity FS
- Residual moisture RR
- Exhaust control
- Dwell time or residual moisture control

**DensityControl**

- Monitoring of fabric density
- Overfeed control at stenter
- Shrinkage control at sanforizing unit
- Special control algorithms for Inlet-Outlet systems

**PLEVA Protocol Server**

- Automatic data acquisition via LAN from any PLEVATEC system
- SQL based PLEVA Protocol server
- Custom-designed data report files as PDF
- Trend graphs and statistics
- Automatic report generation

**Interfaces, other options**

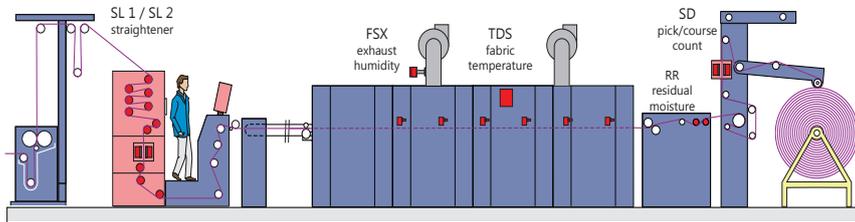
- Profibus, Profinet
- OPC UA
- USB, FTP for CSV data files
- Remote control package
- 2nd visualization
- Air cooling for electro side in SL and PLEVATEC pro15
- Special CAM



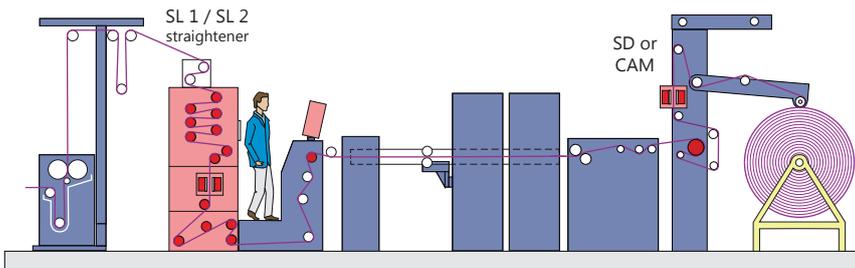
Automatically generated custom-designed report

High-tech Straightening Systems

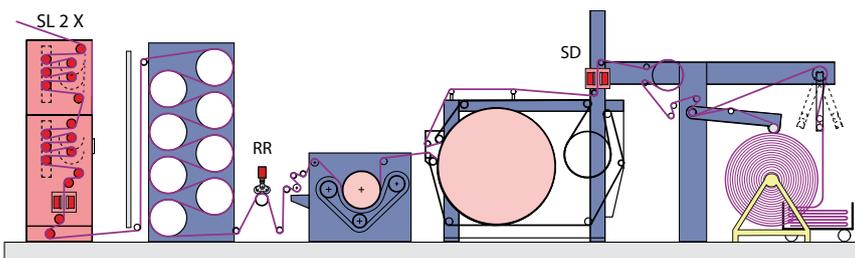
**Straightening of woven goods plus DryControl**



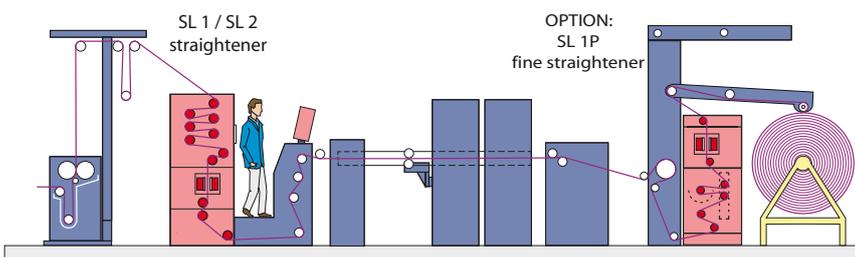
**Straightening of knit ware plus DensityControl (overfeed)**



**Denim finishing plus monitoring of pick density**



**StraightLiner SL 1 in the inlet and SL 1P in the outlet**



Woven goods

- Inlet-Outlet system for wovens with straightening machine SL before and structure detector SD after stenter frame
- Analysis of final distortion and fine tuning of stripping role (option), measurement of widths and pick/course density and overfeed (option)
- Fabric temperature and air temperature measurement TDS
- Residual moisture measurement RR
- Dwell time or moisture control
- Exhaust humidity measurement FSX and exhaust control

Knit goods / tension sensitive fabrics

- Inlet-Outlet system for knits with straightening machine SL 1 before and structure detector SD after stenter frame
- Analysis of final distortion and fine tuning of stripping role (option), measurement of widths and pick/course density and overfeed (option)
- With CAM in the outlet pick/course density and overfeed control (option)

Denim conception (Sanforizer)

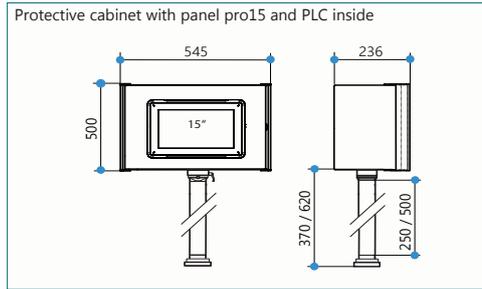
- Automatic Preskewing for anti-twist of wet Denim
- Residual moisture after drum dryer and before sanforizer
- Quality report with SD after sanforizer: Skewing, fabric width, pick density

Woven goods

- Inlet-Outlet system for woven fabric with straightening machine SL 1 before and precision straightener SL 1P after stenter frame
- SL 1P only recommended if fabric is not heat-setted

Visualization and Control

Type PLEVATEC

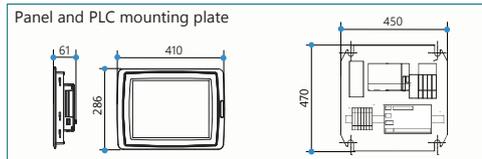


**PLEVATEC**

Ambient temperature: max. 60 °C  
Power supply: 24 V DC  
Power consumption: approx. 220 VA

Panel type pro15: 15.4" touch screen coloured  
Display: 1280x800 pixel (16:10)

Weight protective cabinet: 25 kg  
Option: Stand socket variable according to customer requirements

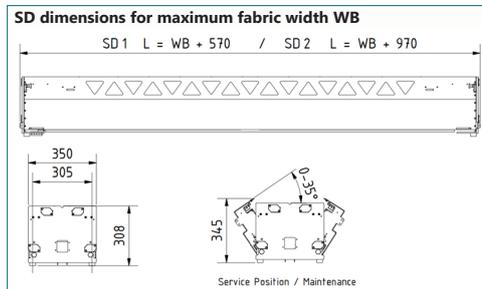


Panel pro15 with mounting plate and PLC (e.g. for SD)

Weight pro15 panel: 4 kg  
Weight PLC mounting plate: 6 kg

SD

Type SD series 300

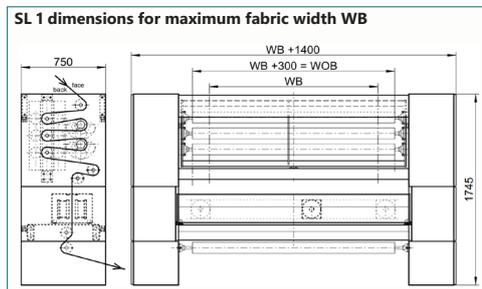


**SD measuring frame**

Ambient temperature: max. 55 °C  
Power supply: 230 V AC (+/- 10 %), 50/60Hz  
Power consumption: max. 0.8 kW (3.5 A)  
Weight: 110 kg (fab. width 1800 mm)

SL 1

Type SL 1 series 300



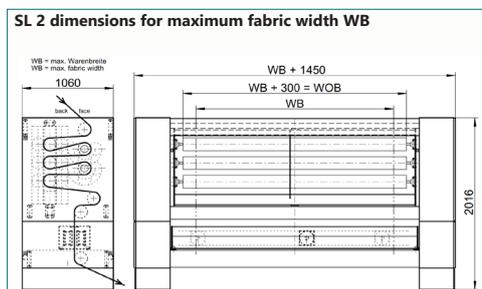
**SL 1**

Ambient temperature: max. 55 °C  
Power supply: 3x400 V AC, 50/60Hz  
Power consumption: from 2.2 to 3.8 kW (3.6 A ... 6.1 A)

Weight  
for fabric width 1800 mm: 1400 kg (SL 1)  
for fabric width 2800 mm: 2600 kg (SL 1, all options)

SL 2

Type SL 2 series 300



**SL 2**

Ambient temperature: max. 55 °C  
Power supply: 3x400 V AC, 50/60Hz  
Power consumption: from 2.3 to 6.4 kW (3.8 A ... 10.6 A)

Weight  
for fabric width 1800 mm: 2400 kg (SL 2)  
for fabric width 5400 mm: 10000 kg (SL 2X, all options)

**Available machines, measuring and control systems for different applications**

- **StraightLiner** for high-tech automatic straightening
- **StructureDetector** for distortion analysis, pick/course density and width measurement
- **Add'nDry** for coating, drying and heat-treatment processes with multiple sensors
- **Dens'nDry** for drying and fixation processes and pick/course density
- **DrumDryControl** for cylinder dryers
- **SizeControl** for controlled size pick-up
- **PadderControl** for continuous dyeing and cold pad batch dyeing
- **Sensors** for fabric temperature, exhaust humidity, oxygen, application and residual moisture

