ELCUT

Web cutting systems

Precise edge and center cutting

Contents

ELCUT – Web cutting systems

Increased quality and productivity

Two different aims are pursued during cutting. Depending on production, a fixed use width must be guaranteed or the edge waste reduced to a minimum.

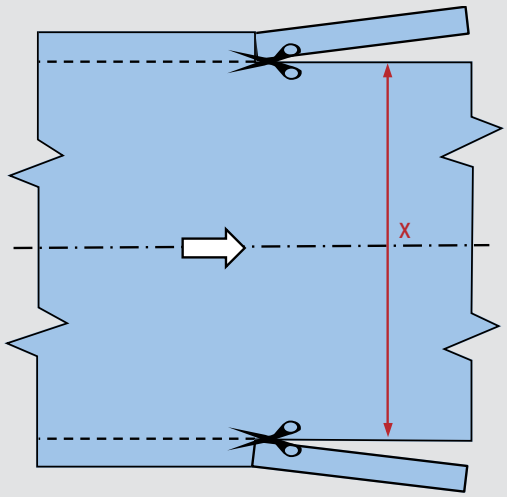
Fixed use width

With laminated and coated materials, the producer must guarantee and exact use width. For this, edge and center cutting devices with manual or motorized positioning to the required use width are particularly suitable.

Typical area of use

+ Laminating machines
+ Coating systems

Example of fixed use width X



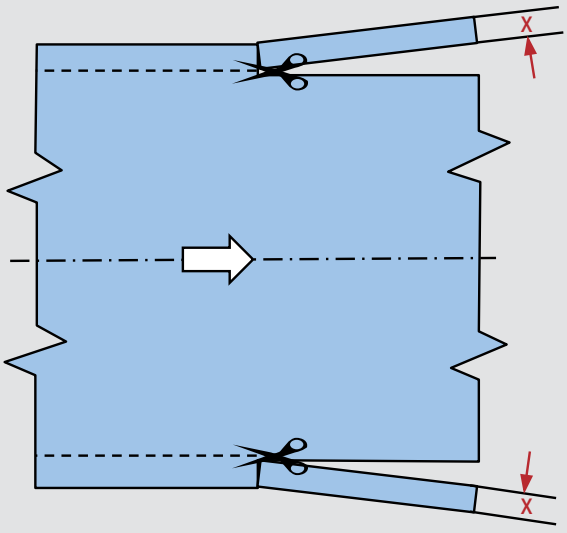
Minimum edge waste

If, by contrast, a maximum use width is required, then the edge waste must be kept as small as possible. In this case, an automatic follow-up controller ensures a constant edge strip width.

Typical area of use

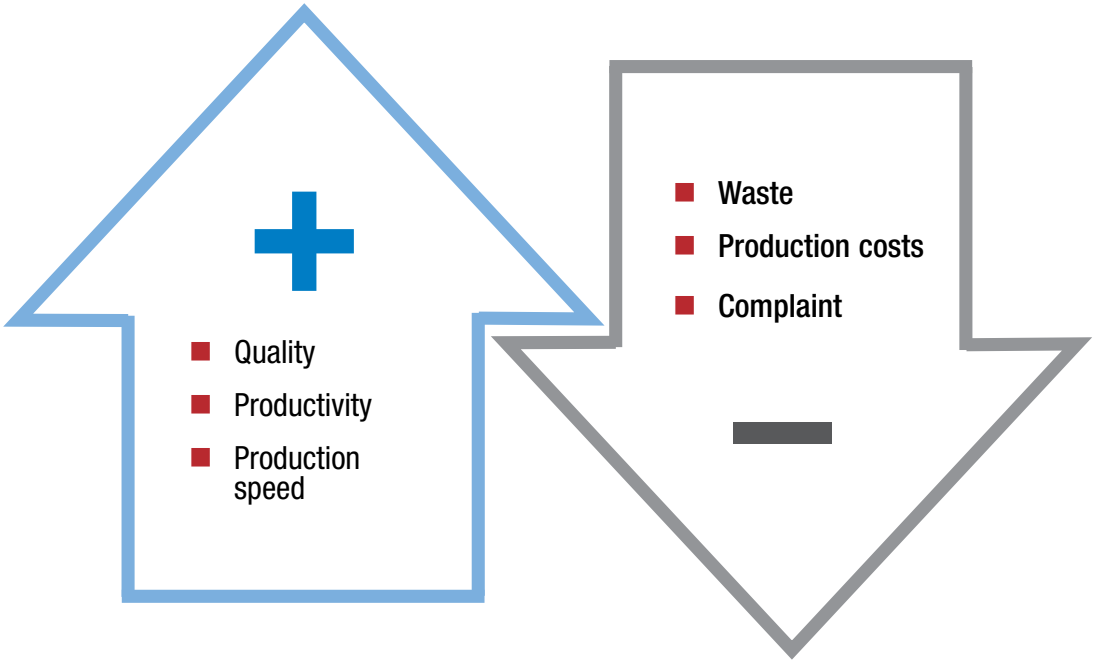
+ Tenters
+ Compactors
+ Sanforization systems

Example of minimum edge strip width X



Your benefit

The cost-reduced and productivity-increasing benefits of the ELCUT cutting system mean that the acquisition costs can be recouped in the shortest of times.

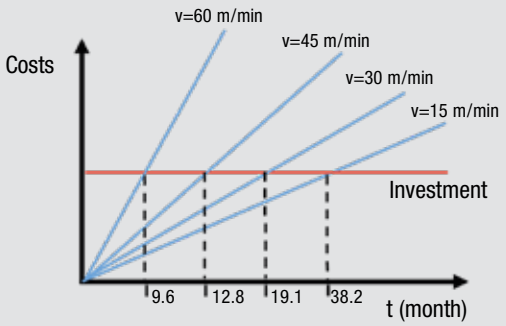


Case example from the textiles industry

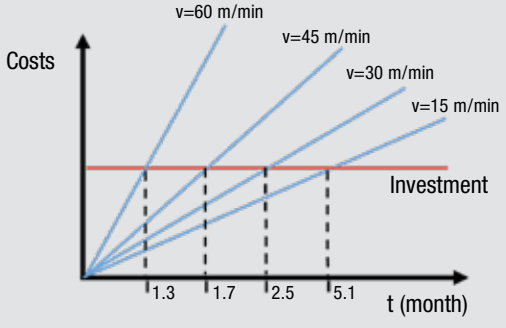
Features	Data	
Product	BT 80	
Machine	Tenter	
Application	Tenter outfeed	
Web type	Knitted fabrics	
Web weight	170 g/m²	
Working width	2000 mm	
Edge waste reduction	1 mm per side	7.5 mm per side
Sales price	3 €/m²	

Average amortization calculation

ROI for edge waste reduction of 1 mm per side



ROI for edge waste reduction of 7.5 mm per side

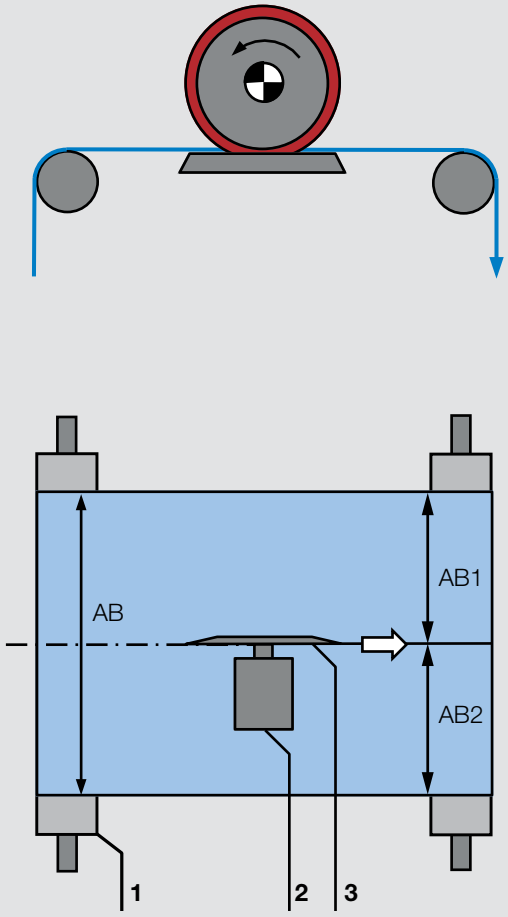


Center cut

Function
With circular blade cutting, a disc blade is driven by a rotary current motor in the direction of web travel. An integrated support table ensures a defined cutting position.

Area of use
Economic solution for center cuts of non-woven, woven and knitted fabrics.

Application
The web must be run flat by guide rollers both in front of and behind the cutting station. The cutting speed should be 5 – 10 times greater than the production speed.



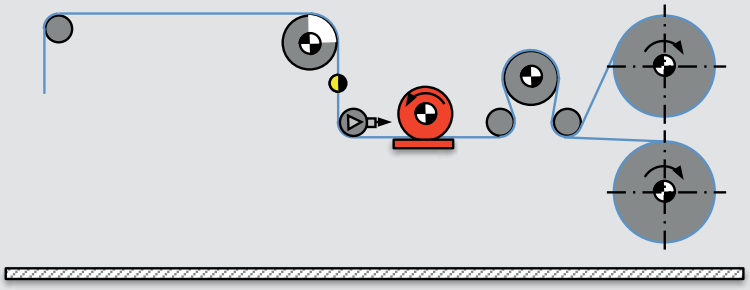
Legend

1	Guide roller
2	Rotary current drive
3	Circular blade
AB	Operating width
AB1	Use width 1
AB2	Use width 2

Web cutting device BTA 02

+ Circular blade cut with rotary current motor
+ Suitable for center cuts of woven and knitted fabrics as well as webs of non-woven fabrics
+ Integrated cutting table for stable cutting position
+ Grinding unit for rapid resharpening of the circular blade

ELCUT BTA 02 web cutting device



ELCUT BTA 02 web cutting device on textile finishing system

Selection table

Web cutting device BTA 02

Type	Speed 50/60 Hz (rpm)	Cutting speed (m/min)	Rated power (kW)
BT 0225	153/183	96/115	0.12
BT 0221	1000/1200	628/753	0.25
BT 0222	1500/1800*	942/1130	0.18
BT 0224	3000/3600*	1884/2260	0.25

*Not suitable for 100% polyester

Technical data

Web cutting device BTA 02	
Material type	Woven fabrics, knitted fabrics, pile fabrics, non-wovben fabrics, carpets, imitation leather, foam rubber
Material thickness	max. 30 mm
Web speed	Max. 200 m/min
Diameter of circular blade	200 mm
Nominal power	0.12 kW/0.18 kW/0.25 kW
Operating voltage	
Range 1	200 – 255/346 – 440 V 50/60 Hz
Range 2	230 – 290/400 – 500 V 50/60 Hz
Current consumption	
Range 1	1.70 – 2.10/1.00 – 1.20 A 50 Hz 1.50 – 1.60/0.90 – 1.00 A 60 Hz
Range 2	0.78 – 0.87/0.45 – 0.50 A 50 Hz 0.69 – 0.78/0.40 – 0.45 A 60 Hz
Protection class	IP 54
Ambient temperature	+10 to +50 °C
Weight	9 kg

Tube cut

Function

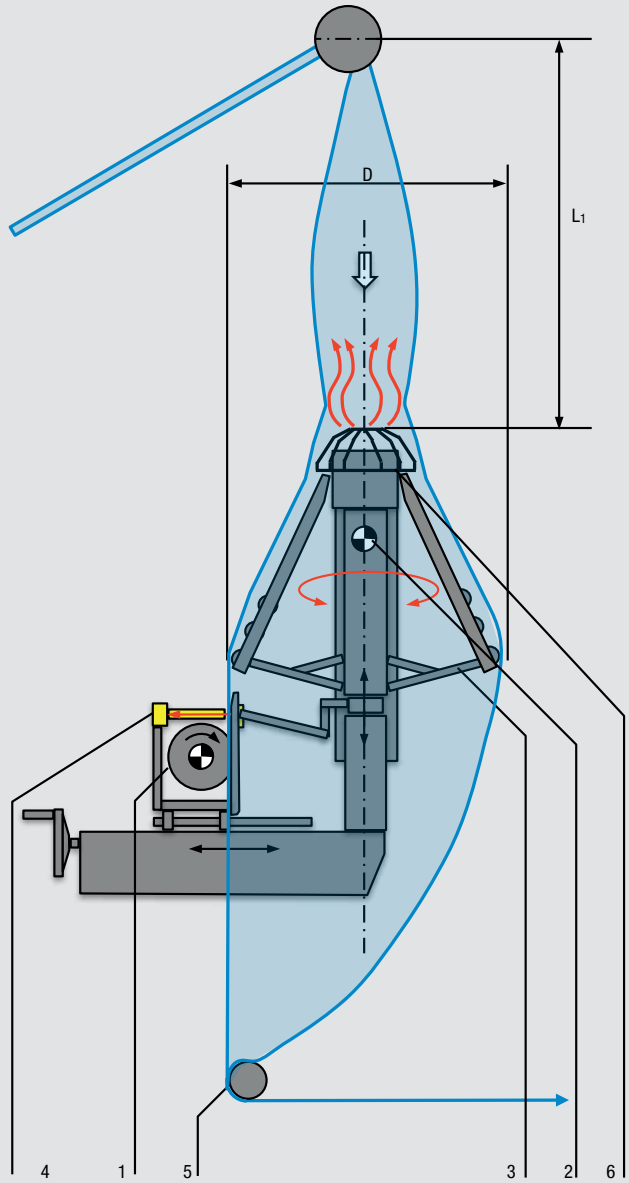
Textile tube goods with a drop stitch must be cut exactly in this reference line. Using a drop stitch matrix sensor, these are detected safely using the transmitted light principle and fed to the position controller as the actual position. The digital position controller continuously compares the target and actual values and constantly controls the motorized, swiveling guide basket. Using a hand wheel, this can be adjusted to the desired tube diameter. The tube-shaped knitted fabric is opened precisely in the drop stitch with a cut of the circular blade.

Area of use

In the textile finishing process, knitted fabrics produced in a tube must be cut open after the drop stitch for further processing.

Application

Normally, with a textile tube, the available excess is twisted and the tube is fed to the tube slitter from above. In so doing, the pre-entry path should be at least 3 m.



Legend

1	Circular blade cut
2	Actuator
3	Swivelable guide basket
4	Sensor
5	Guide roller
6	Fan
D	Tube diameter
L_1	Pre-entry path

Web cutting device BTA 25

- Drop stitch matrix sensor detects the drop stitch using the transmitted light principle
- Position the drop stitch under the sensor, press the Teach button and the sensor learns the guide criterion (Easy Teach mode)
- Rapid positioning of the drop stitch at the beginning of production through LED basket inner lighting
- Stable closed loop with position, speed and current controller
- The roller basket guarantees the minimum longitudinal tension for dry and wet tubes
- Defined static friction between the tube and the spherical guide rollers guarantees rapid, delay-free positioning of the drop stitch in front of the cutting blade
- Speed-controllable fan supports the opening of the tube

ELCUT BTA 2535 Tube slitter

ELCUT BTA 2535 on tube slitting system

Technical data

Web cutting device BTA 2535	
Web type	Tube-shaped knitted fabrics
Tube diameter	350 – 830 mm
Web width	1080 – 2600 mm
Cutting speed	1800 m/min
Web speed	Max. 120 m/min depending on type of web
Web state	Dry, spun dry, squeezed
Ambient temperature	+10 to +50 °C
Operating voltage	200 – 254/346 – 440 V 50/60 Hz
Current consumption, rotary current motor	2.34/1.35 A 50 Hz 1.75/1.00 A 60 Hz
Protection class	IP 54
Weight	60 kg

Web cutting device BTA 25

Drop stitch sensor FE 5204

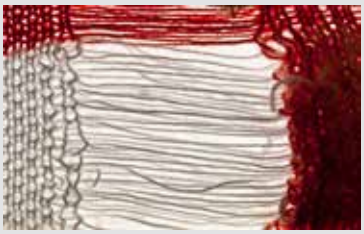
- + Drop stitch matrix sensor for secure detection of the guide criterion
- + Reduced operation work through innovative Teach mode
- + Secure detection of various types of drop stitch, such as double drop stitches
- + Large field of view of 80 mm
- + Up to 40 mm offset of the drop stitches in a seam can be processed without interference
- + Automatic exposure controller for adjustment to different qualities of goods
- + Transmitted light principle with integrated infrared light transmitter

Command station DO 4021

- + Intuitive operation with color touch display
- + Display of the signal quality
- + Connection on the FE 52 via PoE (Power over Ethernet)

Drop stitch sensor FE 5204

Examples of drop stitches



Drop stitch sensor FE 5204

Technical data

Drop stitch sensor FE 52	
Operating voltage	24 V DC
Current consumption	350 mA
Measuring range	±28,5 mm
Field of view	±40mm
Resolution	0.125 mm
Distance sensor – web	176 mm ±2 mm
Width of guide reference	0.5 – 30 mm (Standard 1 – 2 mm) Single and multi-track drop stitches
Scan rate	200 Hz
Ambient temperature	+10 to +50 °C
Protection class	IP 65

Command station DO 4021	
Operating voltage	Supply via POE (Power over Ethernet)
Display resolution	320 x 240 pixels
Ambient temperature	+10 to +50 °C
Protection class	IP 54

Web cutting device BTA 25

Control device SG 2645

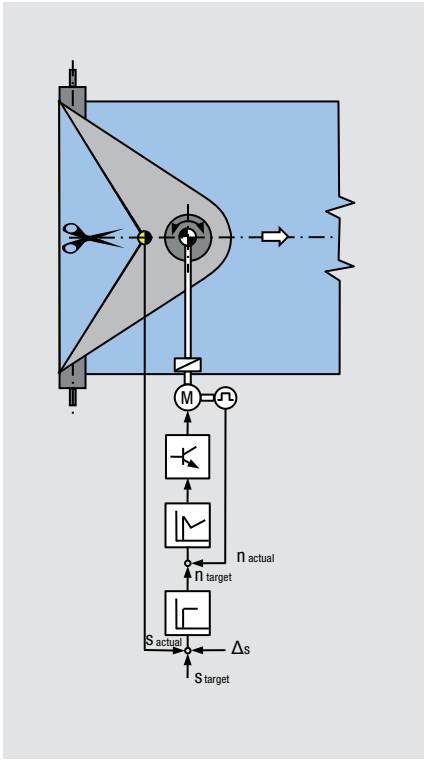
+ Compact control unit for the tube slitter
+ Integrated multi-area transformer with 24 V DC/48 V DC power supply unit for the power supply of the control components and the fan
+ Position controller RK 4004 including logic card LK 4203 and analog input card AK 4014 ready integrated
+ Necessary operating elements integrated in the front side of the switchgear cabinet

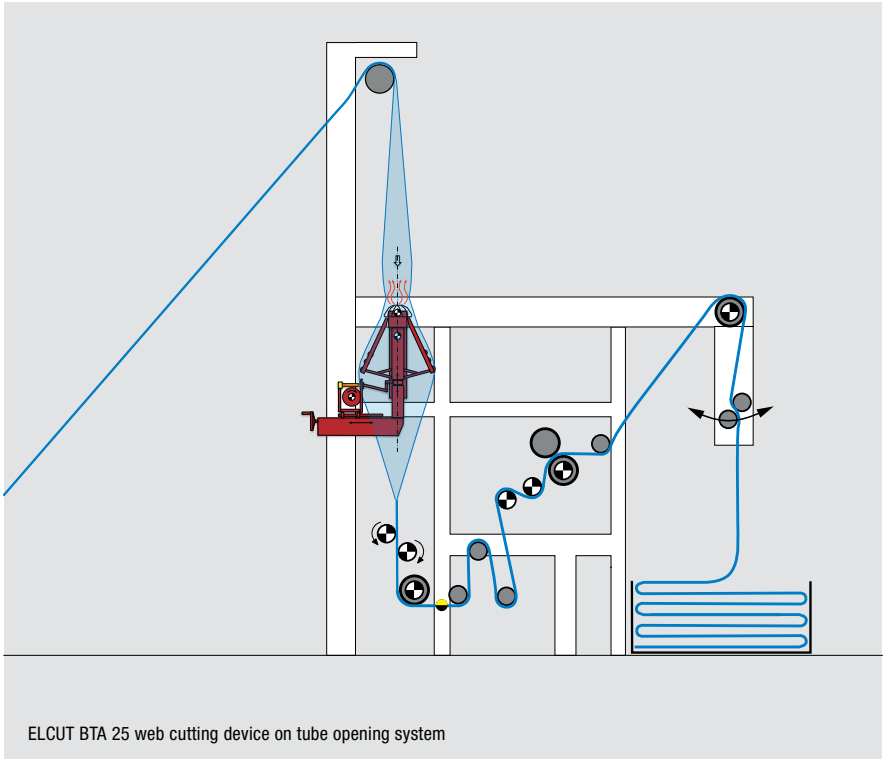
Control unit SG 2645 opened

Control device SG 2645

Control structure for proportional actuator

Besides a positioning controller for the web, the cascaded control structure for the proportional actuator also features a speed and current controller for the actuator.





ELCUT BTA 25 web cutting device on tube opening system

Edge cut

Function
Upper and lower blade shaft are driven by a rotary current motor via a multi-step star gear. Various gear transmissions or the use of frequency-controlled rotary current drives allow infinite adjustment of the cutting speed to the necessary production speed.

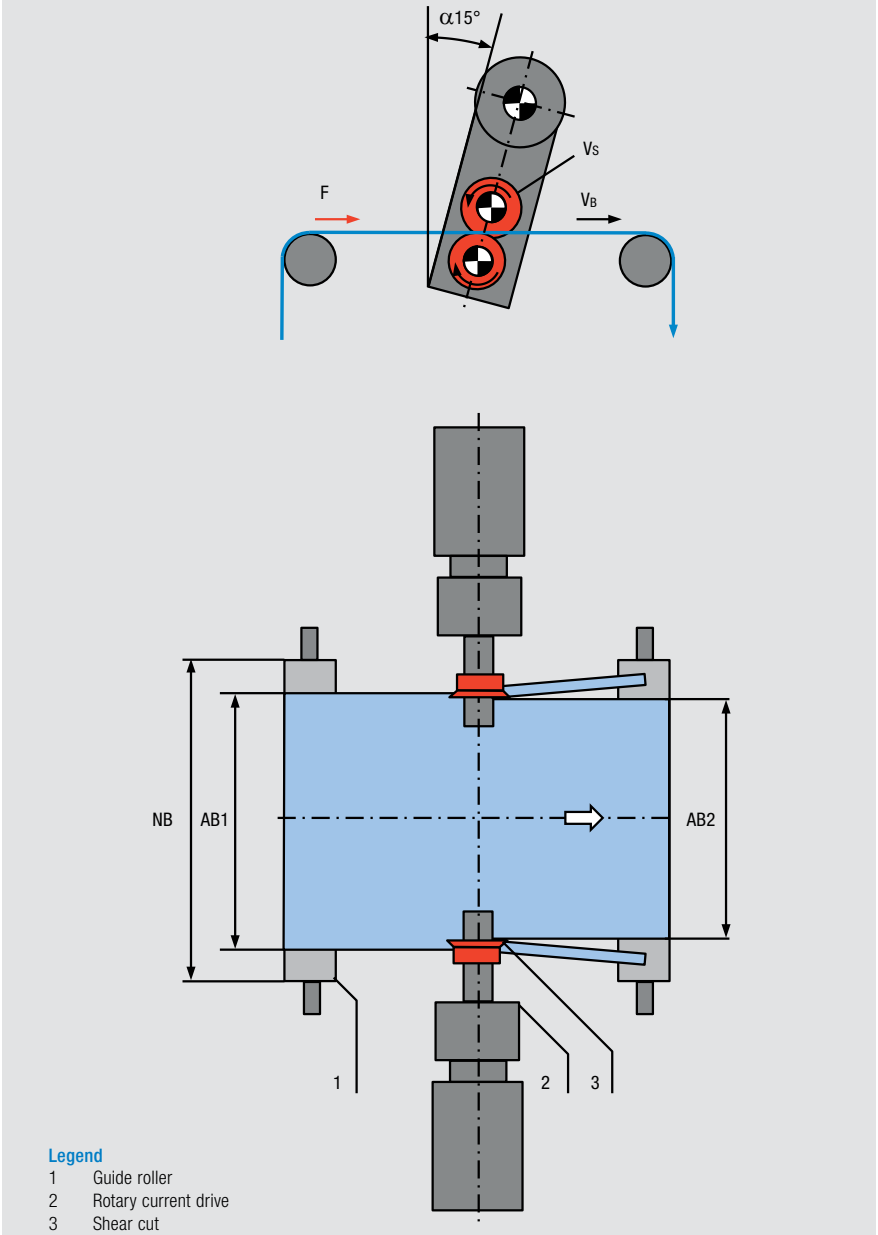
Area of use
The main area of application is production systems for paper, foil, textiles, carpet, non-woven fabric and felt webs. Installation primarily takes place after the last process step before rewinding.

Application
The web cutting device can be used for horizontal and vertical web travels. Slant the web cutting device by 15° for an optimum cutting position.

The cutting speed should be approx. 5 – 10% greater than the web speed.

A web guider in front of the cutting unit optimizes cutting and prevents the web from running away from the blades.

Positioning
For manual or motorized positioning, the user is offered a range of adjustable supports (VWG, VS).



Legend

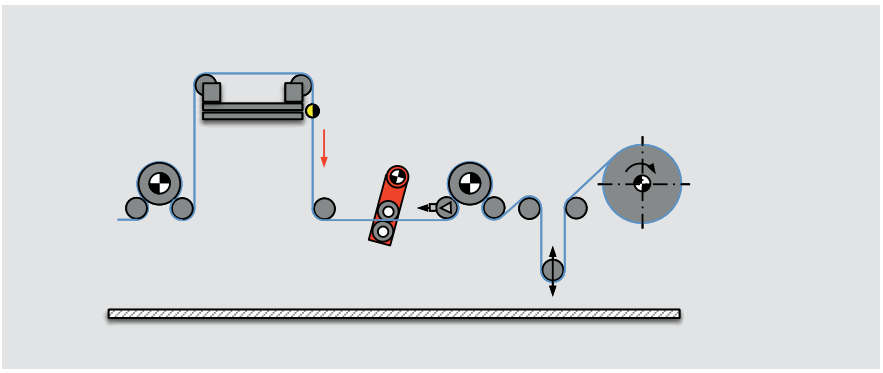
1	Guide roller
2	Rotary current drive
3	Shear cut
α	Slant angle
AB1	Operating width
AB2	Operating width after edge cutting
NB	Nominal width
F	Web tension
V_B	Web speed
V_S	Cutting speed

Web cutting device BTB 01

+ Shear cut principle with driven upper and lower blades
+ Internal/external motor installation
+ Blade shaft for max. 240 mm cut-off
+ Suitable for edge cutting of paper, foil, textile, carpet, non-woven fabric and felt webs
+ Fixed cutting speed or optionally adjustable with frequency converter
+ Three different blade sets for different material types

ELCUT web cutting device BTB 01 with external motor

BTB 01 web cutting device on impregnation system



ELCUT BTB 01 web cutting device on impregnation system

Selection table

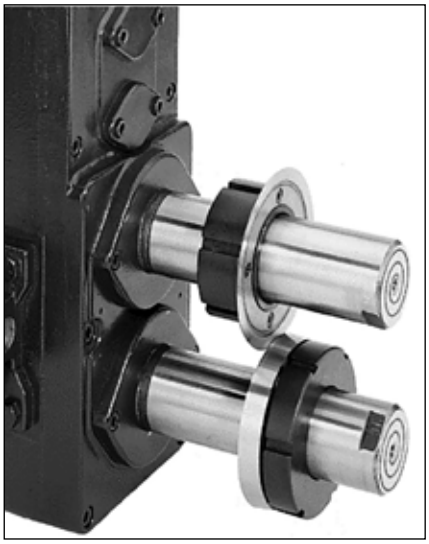
Web cutting device BTB 01			
Type	V (m/min) 50 Hz	V (m/min) 25–100 Hz	Motor attach-ment
BT 0190	22	11 – 45	External
BT 0191	45	22 – 90	External
BT 0192	90	45 – 180	External
BT 0193	125	62 – 250	External
BT 0195	22	11 – 45	Internal
BT 0196	45	22 – 90	Internal
BT 0197	90	45 – 180	Internal
BT 0198	125	62 – 250	Internal

Technical data

Web cutting device BTB 01	
Material type	Paper, card, foil, textiles, carpet, non-woven fabric, felt
Material thickness	max. 8 mm
Edge strip width	110 mm (Standard) 240 mm (with extended blade shaft)
Operating voltage	
Area 1	200 – 255/346 – 440 V 50/60 Hz
Area 2	230 – 290/400 – 500 V 50/60 Hz
Area 3	290 – 330/500 – 575 V 50/60 Hz
Current consumption at 0.37 kW,	
area 1	2.2 – 2.9/1.3 – 1.7 A 50 Hz
Area 2	1.8 – 3.1/1.1 – 1.8 A 50 Hz
Area 3	1.6 – 2.1/0.9 – 1.2 A 50 Hz
Nominal power	0.37 kW (BT 0191/92/93/96/97/98) 0.25 kW (BT 0190/95)
Protection class	IP 55
Ambient temperature	0 – 50 °C
Weight	23 kg

Blade sets for web cutting device

Selection of cutting blade/area of use



Blade set 1

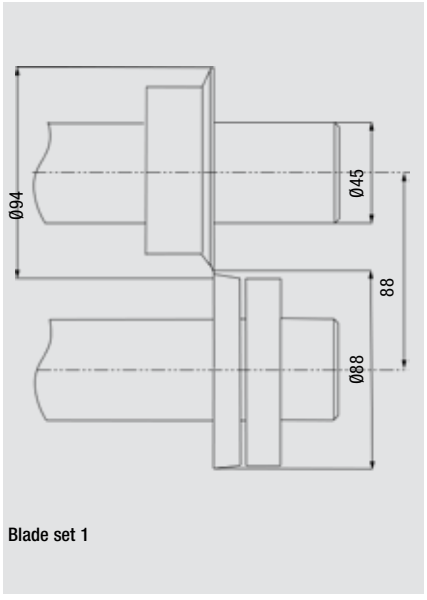
A high contact pressure is created through the horizontal suspension of the bottom blade. This also allows precise cutting of stable materials such as paper, foil and non-woven fabrics.

Blade set 2

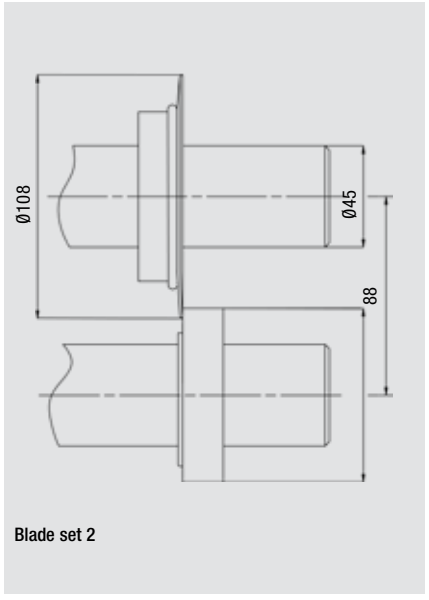
For light materials, such as textiles, this version with a sprung top blade offers a very economic solution.

Blade set 3

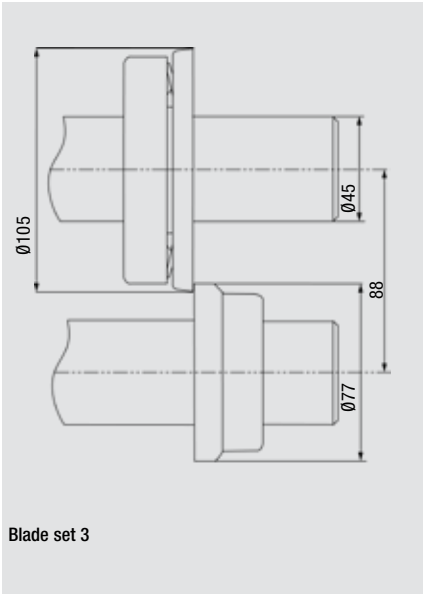
The blade set is particularly suitable for thick materials, such as carpets or felt, as the top and bottom blades are designed as bowl blades.



Blade set 1



Blade set 2

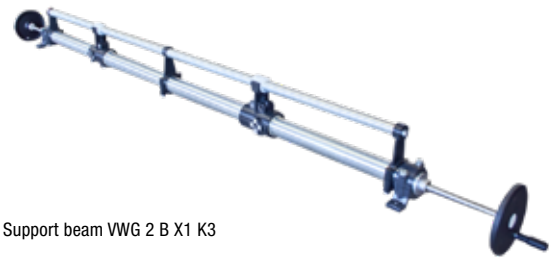


Blade set 3

Positioning of web cutting device

Support beam VWG 2

+ Simple positioning of the web cutting device using a hand wheel
+ Symmetrical position of both devices
+ Individual position of each device with hand wheels on both sides
+ Motorized position available as an option



Support beam VWG 2 B X1 K3

X1 Pedestal bearing

X2 Internal flange bearing

X3 External flange

Selection table

Support beam VWG 2

Type	Positionierung I Sliding guides	Assembly	Surface
VWG A-X1-K3	Symmetrically adjustable	Pedestal bearing	Chrome-plated
VWG A-X2-K3		Internal flange bearing	Chrome-plated
VWG A-X3-K3		External flange bearing	Chrome-plated
VWG B-X1-K3	Individually adjustable separately	Pedestal bearing	Chrome-plated
VWG B-X2-K3		Internal flange bearing	Chrome-plated
VWG B-X3-K3		External flange bearing	Chrome-plated
VWG AB-X1-K3	Individually and symmetrically adjustable	Pedestal bearing	Chrome-plated
VWG AB-X2-K3		Internal flange bearing	Chrome-plated
VWG AB-X3-K3		External flange bearing	Chrome-plated

Web cutting device BTB 01 assembled on support beam VWG 2 B

Support beam VS 60

+ Precise linear guide with DC geared motor and incremental encoder
+ Positional accuracy ±0.5 mm
+ Optimized for follow-up and positioning of cutting devices

Linear unit VS 60

Technical data

Blade follow-up with VS 60

Linear Unit VS 60

Positional accuracy		±0.5 mm (material-dependent)
Nominal actuating travel		200 – 3000 mm (100 mm gradation)
Nominal actuating speed		1 – 55 mm/s adjustable
Nominal support load		500 N
Nominal actuating force		500 N
Ambient temperature		10 to 50 °C
Operating voltage	Nominal value	24 V DC
	Nominal range	20 – 30 V DC
Current consumption		3.4 A DC (per positioning unit)
Incremental encoder resolution		0.03 mm/increment
Weight Basic element with 200 mm actuating travel		9.7 kg
	Per 100 mm	0.7 kg
Protection class		IP 54

Edge cut on tenter

Function
The top blade is powered via a geared motor and carries the spring-mounted bottom blade.

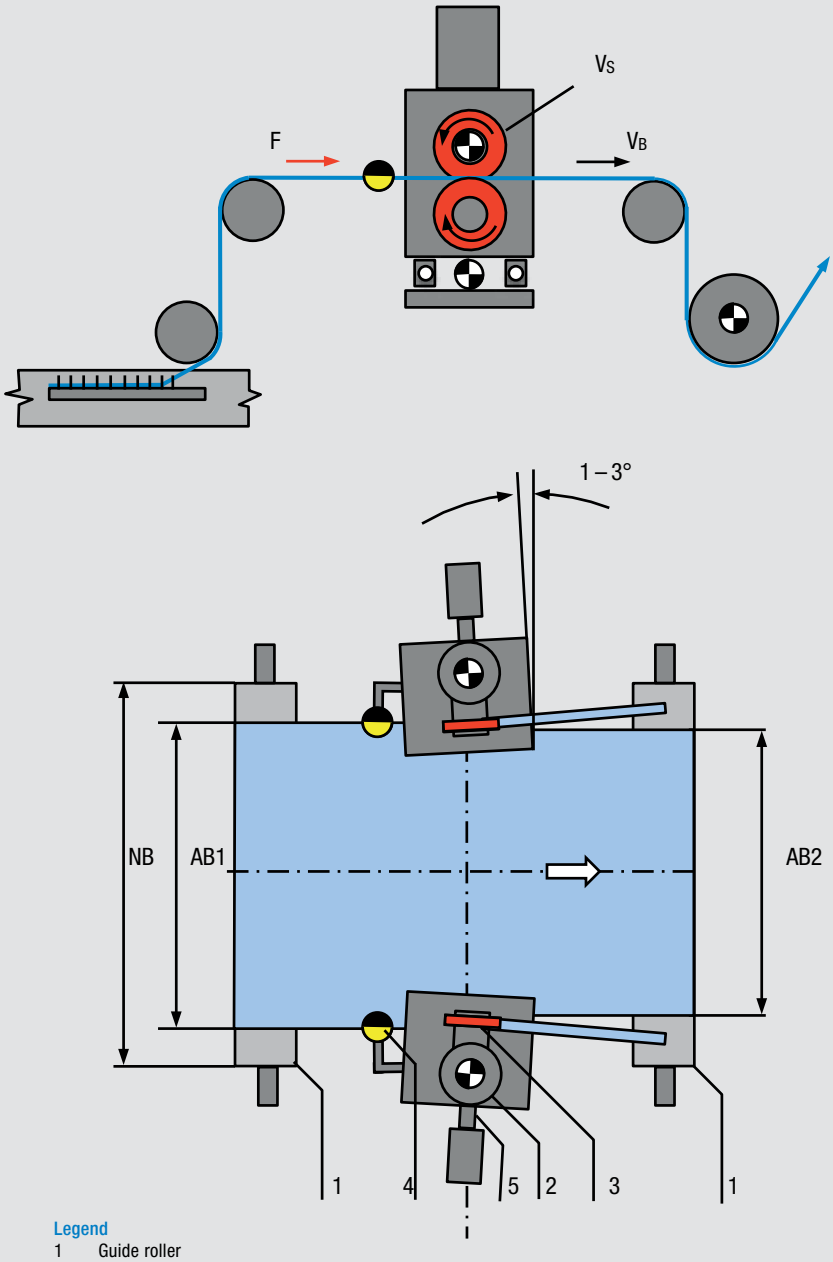
The device is positioned in a user-friendly manner using a motor at the touch of a button or with automatic follow-up according to the web edge.

Minimal edge waste is only achieved when the web edge is fully unrolled. E+L can offer an integrated mechanical spreading unit (E+L patent) for this and, alternatively, a pneumatic solution.

Noise-dampened side channel compressors are available for the removal of any edge waste.

Area of use
Outfeed tenter
Compactor
Sanforizing systems

Application
At the end of the machine, the web is removed from the pins with an initial path roller. Two further path rollers form the cutting level. See graphic alongside



Legend

1	Guide roller
2	Rotary current drive
3	Shear cut
4	Edge sensor
5	Actuator for follow-up
AB1	Operating width
AB2	Operating width after edge cutting
NB	Nominal width
F	Web tension
V_B	Web speed
V_S	Cutting speed

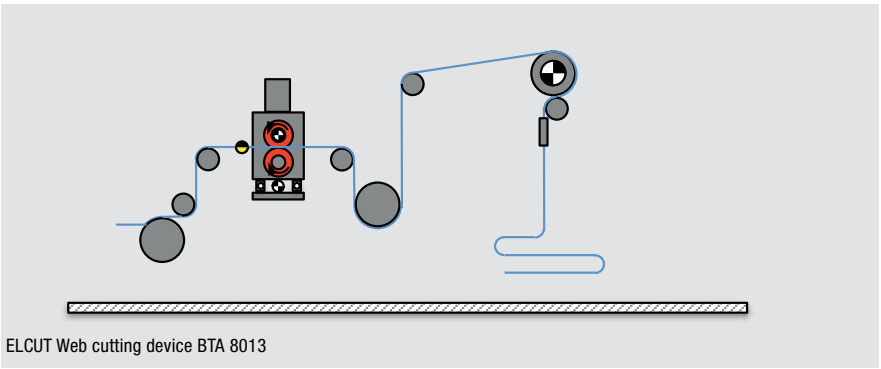
Web cutting device BTA 80

Web cutting device BTA 80

+ Edge cutting system for edge cutting of knitted fabrics
+ Minimum edge waste through cutting outside the pin chain
+ On the standard system, the cutting speed is set at 60 m/min
+ With a frequency converter between 30 and 110 m/min
+ Reliable and fault-free shear cut for minimum waste
+ Spring-mounted bottom blade driven by the top blade
+ Contact pressure on the bottom blade preset by E+L for excellent cutting and extremely high blade service lives
+ Simple blade changing without readjustment of the contact pressure
+ The necessary lubrication of the blades is carried out a wick lubrication system

ELCUT Web cutting device BTA 8013

ELCUT BT 8013 web cutting device at the tenter outfeed



ELCUT Web cutting device BTA 8013

Selection table

Web cutting device BTA 80

Type	Scraper	Positioning	Follow-up control
BT 8001	pneum.	X	
BT 8003	pneum.		X
BT 8011	mech.	X	
BT 8013*	mech.		X

* Standard

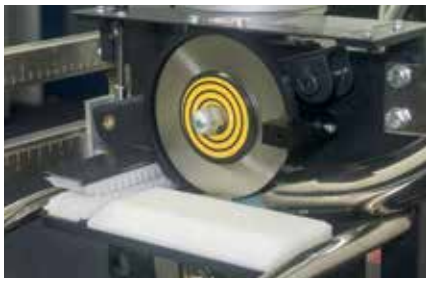
Technical data

Web cutting device BTA 80	
Web types	Woven and knitted fabrics, technical textiles
Cutting speed	max. 60 m/min (Standard) 30 – 110 m/min (with frequency converter)
Operating voltage, cutting motor	220 – 240/380 – 420 V 50 Hz 254 – 277/440 – 480 V 60 Hz
Current consumption	1.32/0.76 A
Nominal power	0.25 kW per cutting unit
Operating voltage, actuating motor	24 V DC
Actuating speed	8 mm/s
Actuating travel	±65 mm
Blade diameter	120 mm
Protection class	IP 54
Ambient temperature	+10 to +50 °C
Weight	40 kg per device

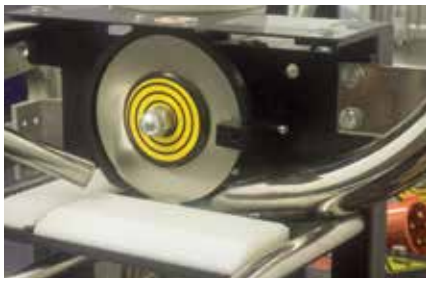
Web cutting device BTA 80

Spreading device

+ The patented mechanical edge spreading device optimizes the edge waste.
+ Adjustable contact pressure
+ Spring-loaded top plate lifts off for thick seams
+ No dust or fluff on mechanical edge spreading device
+ Optionally, a pneumatic edge spreading device is available



Mechanical spreading device



Pneumatic spreading device

Suction device BT 7700-15

+ Automatic extraction of the edge strips through noise-reduced side channel compactor with Venturi nozzle

Suction device BT 7700-15

Technical data

Suction device BT 7700-15	
Flow rate	approx. 3 m³/min
Operating voltage	200 – 240/345 – 415 V 50 Hz 220 – 275/380 – 480 V 60 Hz
Current consumption	9.7/5.6 A 50 Hz 11.0/6.5 A 60 Hz
Nominal power	2.2 kW 50 Hz per device 2.5 kW 60 Hz per device
Nominal rotation speed	2860/3440 rpm
Operating pressure	Approx. 140 mbar
Ambient temperature	+10 to +50 °C
Noise (at a distance of 1 m)	78 dB per device
Protection class	IP 54
Weight	Approx. 63 kg per device
Ambient temperature	+10 to +50 °C

Web cutting device BTA 80

Follow-up control

+ Automatic blade follow-up in reference to web edge
+ Broadband infrared edge sensor with 158 mm measuring range and 0.1 mm resolution
+ Precise proportional follow-up with digital position controller
+ Even highly transparent textile web edges can be detected safely
+ Integrated direct current drive for the positioning of the cutting device

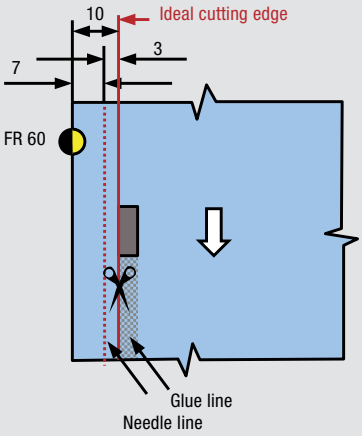
Operation

+ The operation remote from the cutting device at the press of a button guarantees simple optimization of the cutting result
  - » Automatic/manual operation mode
  - » Alteration of the cutting position
  - » Free outward movement for setting up

Sensor FR 6011

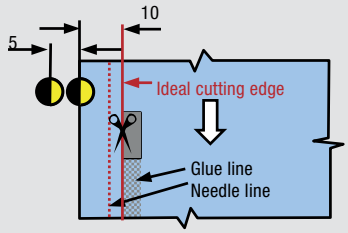
Controller DC 9156

Optimum cutting position with a proportional follow-up control

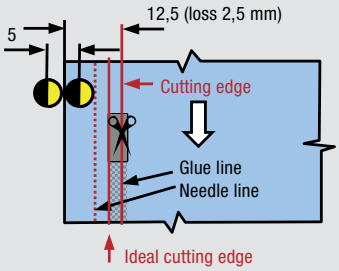


Cutting edge of competitors' systems with light barrier

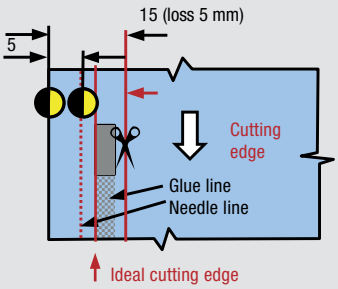
Web edge at right light barrier



Web edge centered in relation to the light barrier

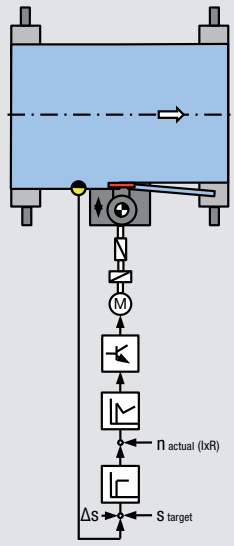


Web edge at left light barrier



Control structure for follow-up controller

Besides a positioning controller for the cutting device, the cascaded control structure for proportional actuators also features a speed and current controller for the actuator.



Technical data

Follow-up control	
Positional accuracy	±1 mm
Sensor measuring range	±79 mm
Operating voltage Nominal value Nominal range (ripple included)	 24 V DC 20 – 30 V DC
Max. current consumption	2.5 A
Ambient temperature	+10 to +50 °C

Questionnaire

General data

Customer			
Street			
Zip code		**City/town**	
Country		**Internet**	
Phone		**Fax**	
Contact person			
Phone		**e-mail**	
Project			

Technical data

Machine type				
Make				
Position on the machine				
Web type	❑ Woven fabrics ❑ Paper	❑ Knitted fabrics ❑ Foil	❑ Non-woven fabric ❑	❑ Carpet
Web width	Min. _____ mm		Max. _____ mm	
Web thickness	Min. _____ mm		Max. _____ mm	
Web weight	Min. _____ gr/m²		Max. _____ gr/m²	
Tube diameter	Min. _____ mm		Max. _____ mm	
Web speed	Min. _____ m/min		Max. _____ m/min	
Operation status	❑ Dry	❑ Moist	❑ Wet	❑
Ambient temperature	_____ °C			
Ambient conditions	❑ Dry	❑ Dusty	❑ Wet	❑
Control voltage	❑ 24 V DC		❑ V	❑ Hz
Operating voltage	❑ 3x V	❑ Hz		

Specification of cutting unit

❑ **Center cut with BT 02**	Number of center cuts::		
❑ **Tube cut with BT 25**	Mounting position	❑ Standing	❑ Hanging
	Control unit	❑ With housing	❑ Assembly kit
	Fan for tube opening	❑ With	❑ Without
❑ **Edge cut on tenter with BT 80**	Follow-up control	❑ With	❑ Without
	Spreading	❑ Mechanical	❑ Pneumatic
	Suction device	❑ With	❑ Without
	Variable cutting speed with frequency converter	❑ With	❑ Without

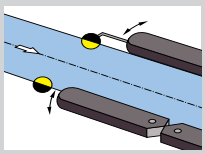
❑ **Edge cut with BT 01**	Edge strip width	mm		
	Web run		❑ Horizontal	❑ Vertical
	Cutting speed		❑ Fixed	❑ Variable
	Control unit		❑ With housing	❑ Without housing
	Target speed value		❑ With E+L tachogenerator	❑ Customer-side 0 – 10 V DC
	Support beam version	❑ Individually adjustable	❑ Symmetrically adjustable	❑ Individually and symmetrically adjustable
	Support beam fastening	❑ Pedestal bearing	❑ Flange bearing, inner	❑ Flange bearing, outer
	G-dimension, support beam	mm		

Application

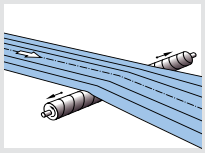
Comments

Date		**Issuer**	

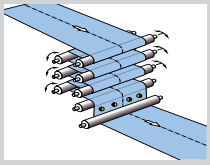
Other products for the textile industry



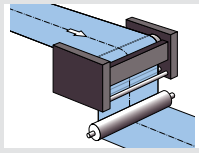
ELFEED – Tenter infeed systems



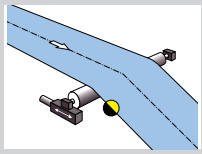
ELSPREADER – Web spreading systems



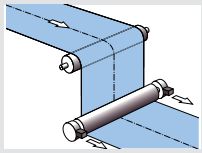
ELSTRAIGHT – Textile straightening systems



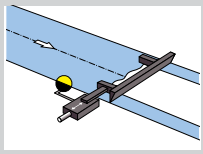
ELSMART – Web guiding systems



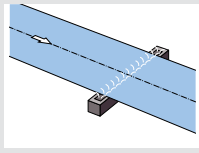
ELBANDER – Conveyor belt control systems



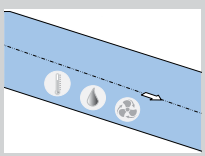
ELTENS – Web tension control systems



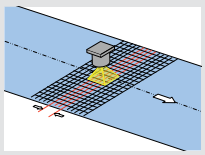
ELPOSER – Positioning and follow-up control systems



ELMETA – Metal detection systems



ELMAT – Process control systems for tenters



ELCOUNT – Thread counting systemd

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