

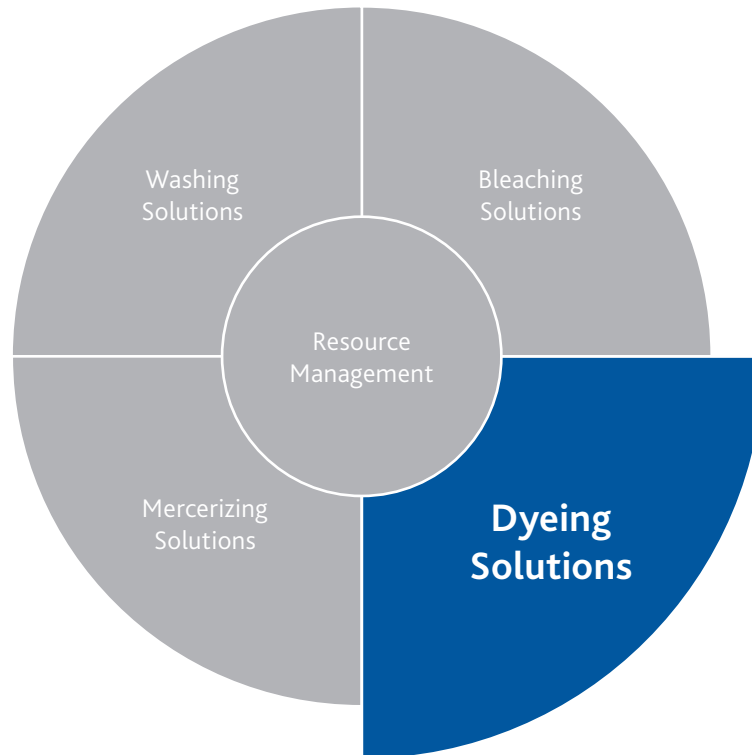


BENNINGER

**Dyeing
Solutions**

Woven Line

Leader in wet textile finishing



BEN-COLOR

The complete program for continuous and CPB dyeing

- High reproducibility
- Even dyeing results
- Low energy and water consumption
- High fastness properties
- No salt



BEN-WASH

The complete range for all washing processes

- Excellent washing performance
- Minimum water consumption
- High energy efficiency
- Up to 50% water and steam savings in comparison to the exhaust process



BEN-BLEACH

Continuous desizing and bleaching in one step

- High productivity
- Best pre-treatment results
- 30% lower production costs



BEN-DIMENSA

Highest quality mercerizing and caustification for maximum luster, dimensional stability and dye yield

- Improved dimensional stability
- Higher dye yield
- High luster
- For woven fabric and knitwear
- Silky, soft feel



BEN-ECO

Environmental protection and cost savings by recovering energy and resources

- Caustic recovery systems
- Heat recovery
- Waste water recycling and "zero discharge" solutions
- Energy-efficient drive technology
- CO₂ reductions by the use of the latest technologies

Customized textile solutions

Mission

Customized

Benninger supplies tailored process solutions with innovative and reliable products as well as comprehensive know-how in textile process engineering, always based on close collaboration and communication with our clients.

Textile

Our concepts are fully geared to the textile applications of our customers. With its many years of experience and comprehensive textile competence, Benninger creates long-term added value for its customers. Benninger is backed by a large number of reference installations for each of the individual applications.

Solutions

Benninger is an integral solution provider. We plan and implement technologically optimized and individual process and system solutions. We are a trustworthy and reliable partner throughout the entire life cycle of the plant.

Sustainability

For Benninger, assuming responsibility is a matter of course. We are committed to sustainability – for example by investing in the development of high-quality products as well as ecologically efficient processes. We actively save water, energy, chemicals and we also focus on recycling waste water, exhaust heat and valuable materials. Integral consideration of the relevant factors is equally as important to us as the balance between ecological and economic concerns.

With regard to sustainability, Benninger has central obligations. Wherever possible we work with maximum environmental awareness and conserve resources. We are aware of our social responsibility towards communities, consumers and our employees. We continuously improve our economic performance and support the sustainability aims of our customers.

Customer benefits

Our clients do not need products, they need solutions. At Benninger, customer benefits and needs are the central focus of all activities. High quality, process know-how, many years of specialist competence, unique application know-how, local availability and flexibility make us a reliable solution provider for the textile industry.

Our range of goods and services is continuously optimized and supplemented. We have tremendous innovative power, a high level of specialist and process expertise and have installed a large number of systems. New findings are continuously included into the development of solutions – always with the aim of enhancing the success of our customers. We improve the entire value-added chain of our customers by observing the process life cycles, and with quality products and a comprehensive range of services guarantee efficient and reliable plant operation.

Tradition

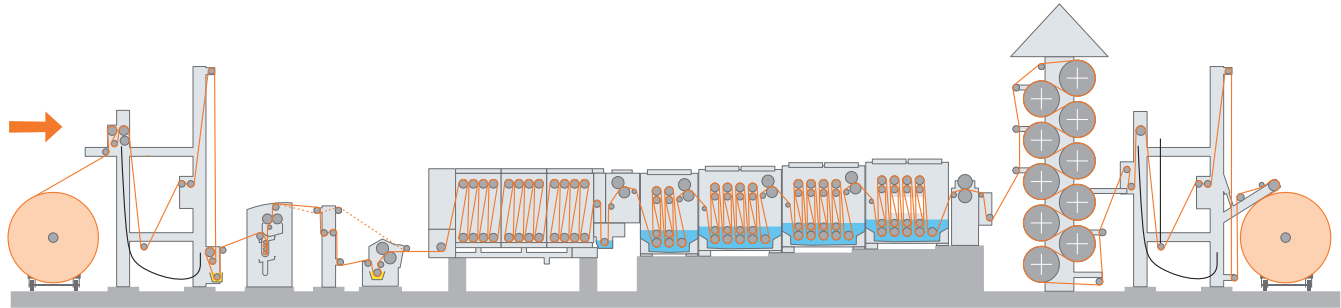
The future is rooted in the past. There is hardly anything more important than one's own history, as the innovations and business relationships of today and tomorrow are founded on the experience and know-how gained in the past. Benninger has been a global benchmark for competence and outstanding performance in wet textile finishing for more than 150 years. We always feel bound to our cultivated tradition of continually improving our services, products and processes so that the Benninger brand will continue to stand for quality, reliability and vision in the future.

As a company with international operations we are proud to support our customers on a basis of partnership and carry Swiss values such as high quality, reliability and trustworthiness out into the world.



An optimum solution for every application

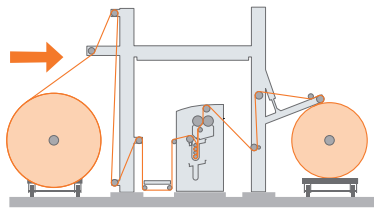
Fully continuous PAD-STEAM process



Continuous dyeing of cotton
With reactive and sulphur dyes,
or vat wet/wet

Maximum productivity
Very good fastness properties
High dye yield

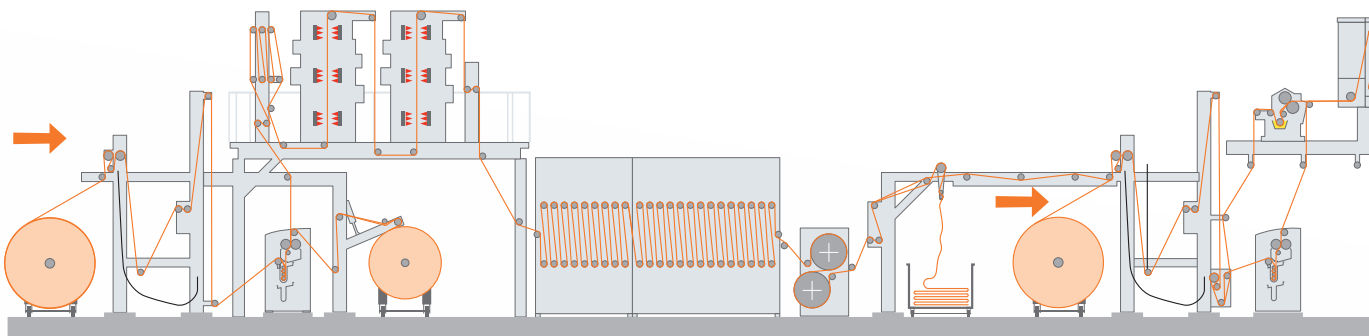
CPB dyeing station



Cold pad batch process CPB
Dyeing of cotton with reactive dyes

Minimum production costs
Also suitable for short lots
High fixation rate

Fully-continuous PAD-DRY and PAD-STEAM processes



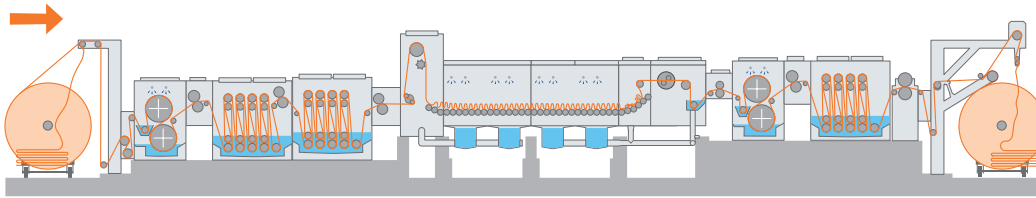
Pad-dry and pad-steam processes for continuous
dyeing of cotton with reactive and vat dyes as well as
cotton/polyester with disperse dyes

High degree of flexibility
For long batch lengths
Very good fastness properties

FACTS

- Full product range for continuous dyeing
- Even dyeing results
- Very good dye fastness properties
- Short throughput times
- High productivity
- Universal and versatile system
- Crease-free
- High reproducibility

Combined drum and roller vat washing machine



Washing after CPBDyeing
Washing after Printing



High washing, water and
rubbing fastness



PROCESS RANGE

Dyeing technology from one source

Dye class	Process	Substrate	1 Küsters DyePad	2 AIR PASSAGE	3 THERMRAY IR PRE- DRYER	4 THERMFIX HOTFLUE	5 THERMFIX HOTFLUE	6 Küsters DyePad	7 AIR PASSAGE	
Reactive dyes	COLD-PAD BATCH	Cotton							Dyestuff Alkali	→
	PAD-DRY/ PAD-STEAM		Dyestuff	Penetration	Pre-drying	Drying	→			
	PAD-STEAM all in								Dyestuff Alkali	→
	PAD-DRY/ Thermofix		Dyestuff Alkali	Penetration	Pre-drying	Drying	Thermofixing	→		
	PAD-HUMIDITY CONTROL		Dyestuff Alkali	Penetration	Pre-drying	Wet fixing	→			
Vat dyes	PAD-DRY/ PAD-STEAM	Cotton	Dyestuff	Penetration	Pre-drying	Drying	→			
	PAD-STEAM (wet/wet)								Dyestuff	Penetration
Sulphur dyes	PAD-STEAM single bath	Cotton							Dyestuff Reduction agent	→
Naphtol dyes	PAD-STEAM Pad Develop	Cotton	Naphtolate	→	Electrical pre-drying	Drying	→	Dyeing salt	→	
Reactive/ disperse dyes	DRY-PAD- THERMOSOL	Cotton/ Polyester	Dyestuff	Penetration	Pre-drying	Drying	Thermosoling	→		
Vat/ disperse dyes	PAD-STEAM	Cotton/ Polyester	Dyestuff	Penetration	Pre-drying	Drying	Thermosoling	→		

Comprehensive know-how

With the BEN-COLOR process range Benninger supplies overall solutions for continuous dyeing at the highest technical level and fully satisfies all requirements.

Flexible layouts

The systems can be flexibly designed for all dyeing processes and extended at any time. A DyePad unit and an EXTRACTA washing plant are sufficient for dyeing 100 % cotton by CPB.

With the DyePad padder or a Booster and a REACTA dyeing steamer the CPB system becomes a PAD-STEAM dyeing system. A Pad-Dry dyeing system, a drying section with IR pre-dryer and HOTFLUE THERMOSOL are also required for cotton and cotton/polyester.

	8 BOOSTER	9 REACTAsteamer	10 EXTRACTA
		Batching	Rinsing and soaping
	Alkali	Steaming	Rinsing and soaping
		Steaming	Rinsing and soaping
			Rinsing and soaping
			Rinsing and soaping
	Reducing agent	Steaming	Oxidation and soaping
n	Reducing agent	Steaming	Oxidation and soaping
		Steaming	Oxidation and soaping
		Air passage	Rinsing and soaping
	Alkali	Steaming	Reductive cleaning and rinsing
	Reducing agent	Steaming	Oxidation and soaping

FACTS

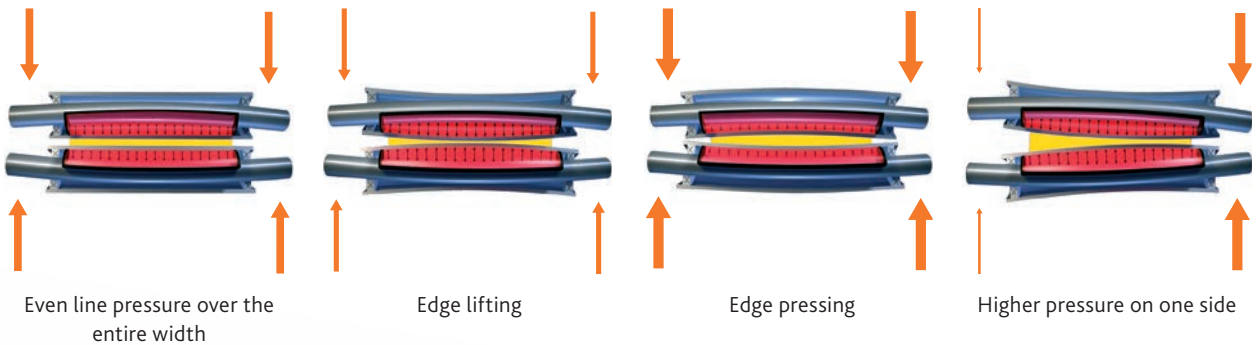
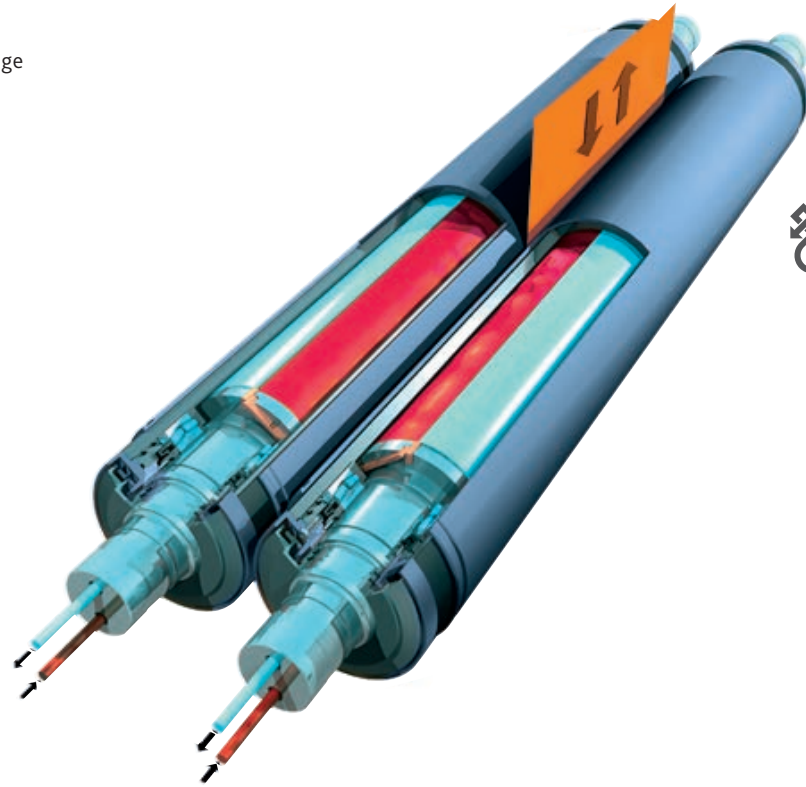
- Full product range for continuous dyeing
- Even dyeing results
- Very good dye fastness properties
- Short throughput times
- High productivity
- Universal and versatile system
- Crease-free
- High reproducibility

S-ROLLER TECHNOLOGY

Reproducible results

S-roller

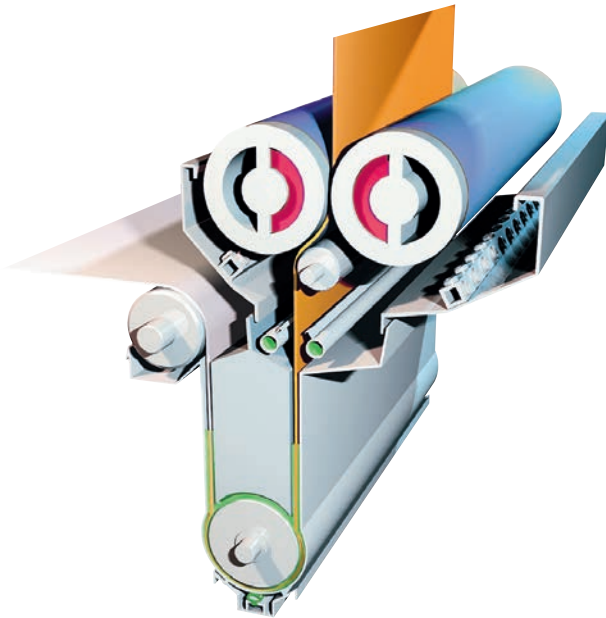
Maximum correction range



Technical data	333.11	333.17	222.20
Number of S-rollers	2	2	2
Fabric width (mm)	1600–2600	2400–3600	3800–5200
Diameter of the S-rollers (mm)	220	300	350
linear pressure (N/mm)	10–50	10–40	12–40

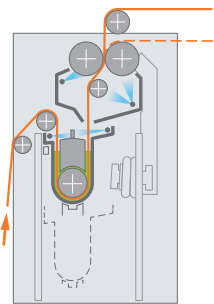
KÜSTERS DyePad

Dyeing without compromises

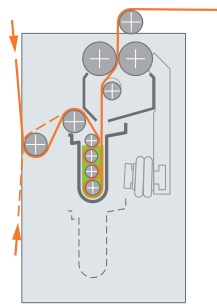


S-roller padder

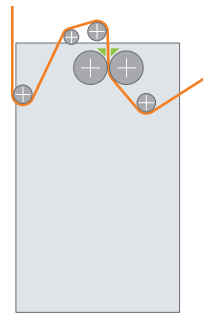
Optimum padder configuration for all applications



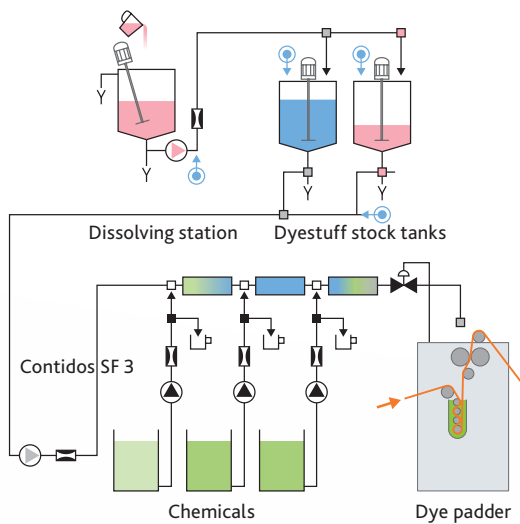
For woven fabric and knitwear with quick cleaning



For woven fabric without quick cleaning



For nip dyeing



FACTS

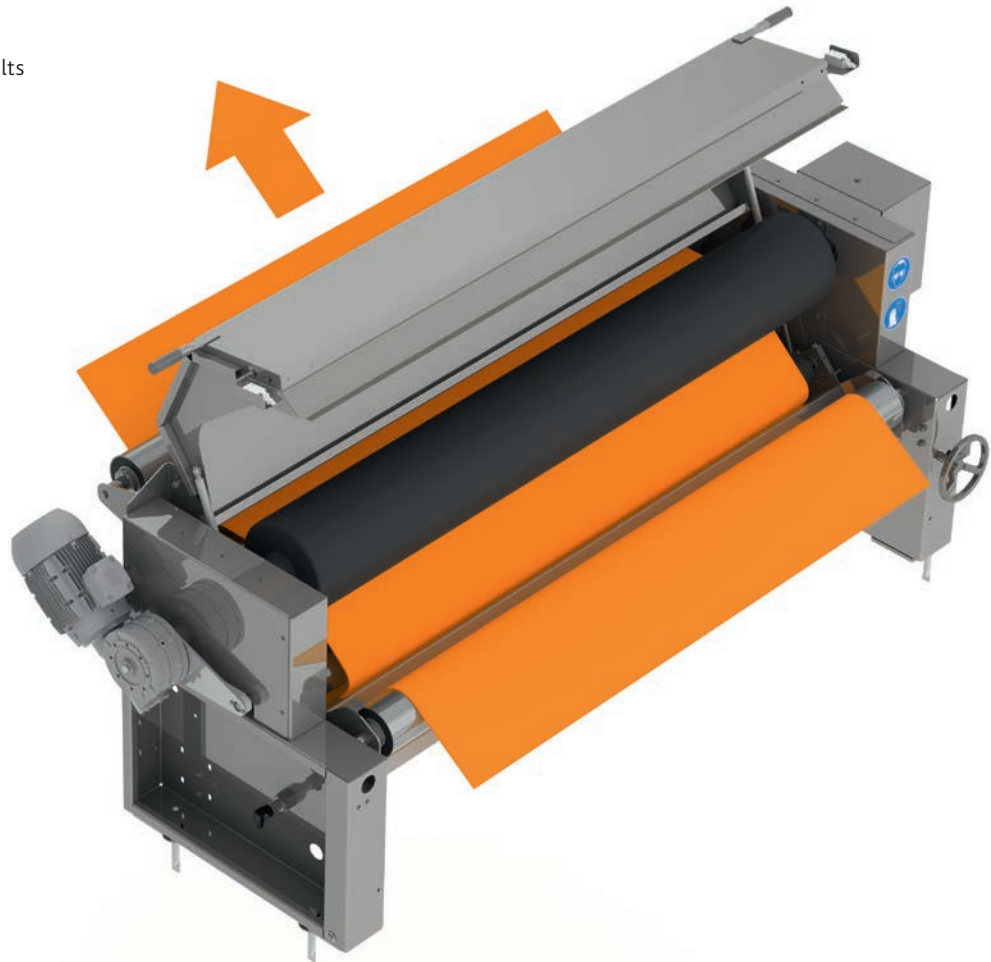
- High reproducibility
- Lower waste water contamination due to low liquor content
- Even, linear liquor application due to two deflection-controlled rollers
- Very low energy consumption
- Minimum liquor content during nip dyeing
- Low investment costs

BOOSTER

Controlled chemical application

Booster

For uniform dyeing results



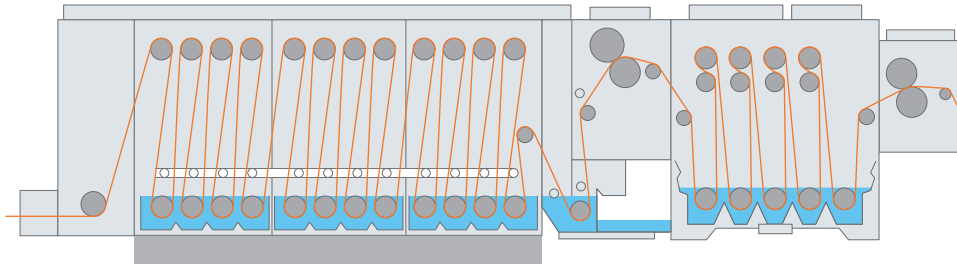
The special squeezer of the BOOSTER guarantees uniform liquor pick-up irrespective of the speed and fabric weight. The linearity of the squeezing nip is still ensured in spite of the freely adjustable contact pressure. The liquor pick-up ranges from 70–130 %.

FACTS

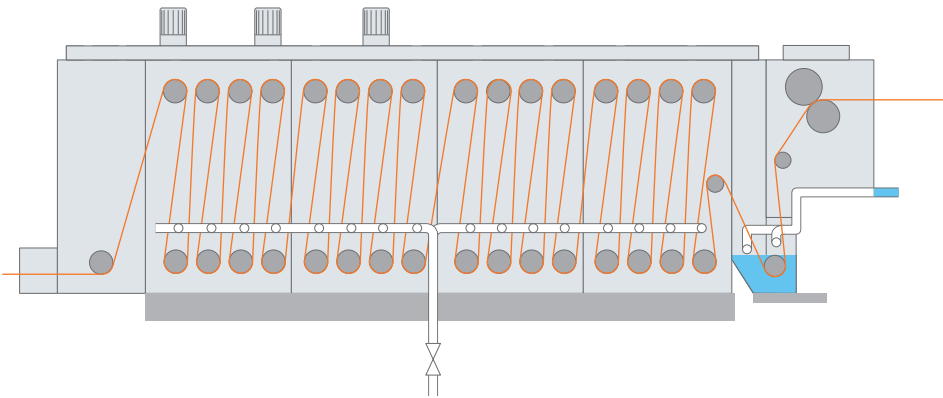
- Cylindrically ground soft rubber rollers
- Excellent accessibility
- Very easy to clean
- Moveable liquor displacer
- Chemical feed across the entire width

REACTA DYEING STEAMER

Perfect dyestuff fixation



Bi-functional dyeing steamer for steaming and washing



Standard dyeing steamer

Perfect dyestuff fixation in the REACTA

Constant saturated steam conditions in the steamer are the basic requirement for perfect dyeing and reproducibility.

The Benninger steam conditioning unit always supplies constant and saturated steam to the REACTA dyeing steamer. The design of the steamer and monitoring of the steam conditions guarantee that the steamer is absolutely air-free. Minimum deviations immediately trigger automatic correction of the steam supply.

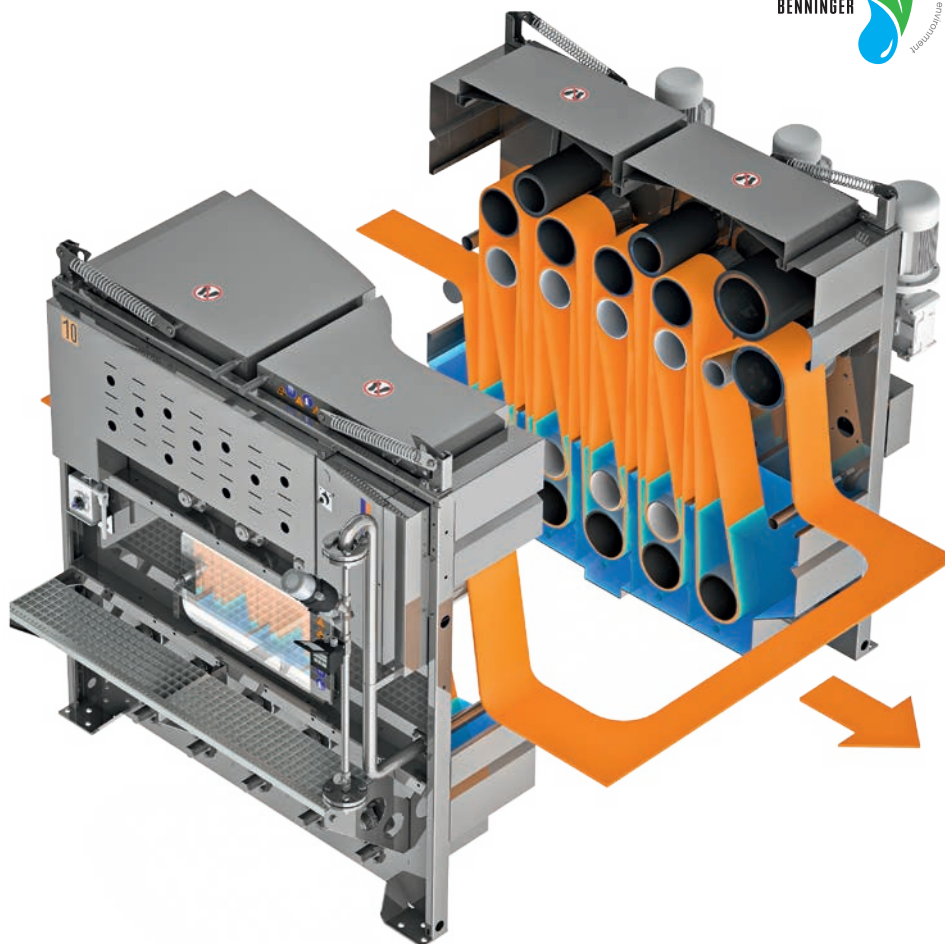
FACTS

- High reproducibility
- High process reliability (guaranteed saturated steam conditions)
- Airfree
- Tension-free and crease-free fabric transport
- High efficiency due to bi-functional design
- Short downtimes
- Optimum automatic cleaning
- Temperature-controlled water seal
- Good accessibility, no dead zones, large windows
- Roof heating

EXTRACTA

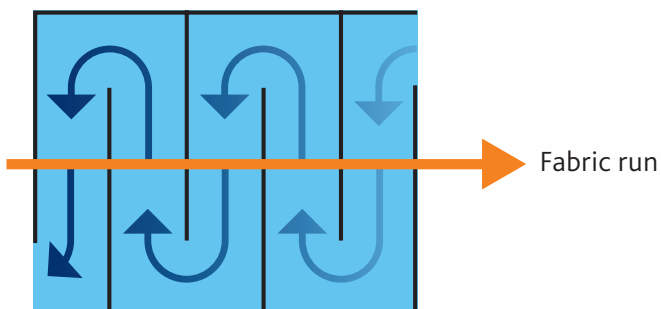
High washing efficiency due to the multi-chamber system

Roller vat washing machine for woven fabric



Counterflow principle

The meander counterflow configuration permits a concentration gradient. The washing process is divided into several washing steps that are repeated. The washing results can therefore be calculated on the basis of models and guaranteed.



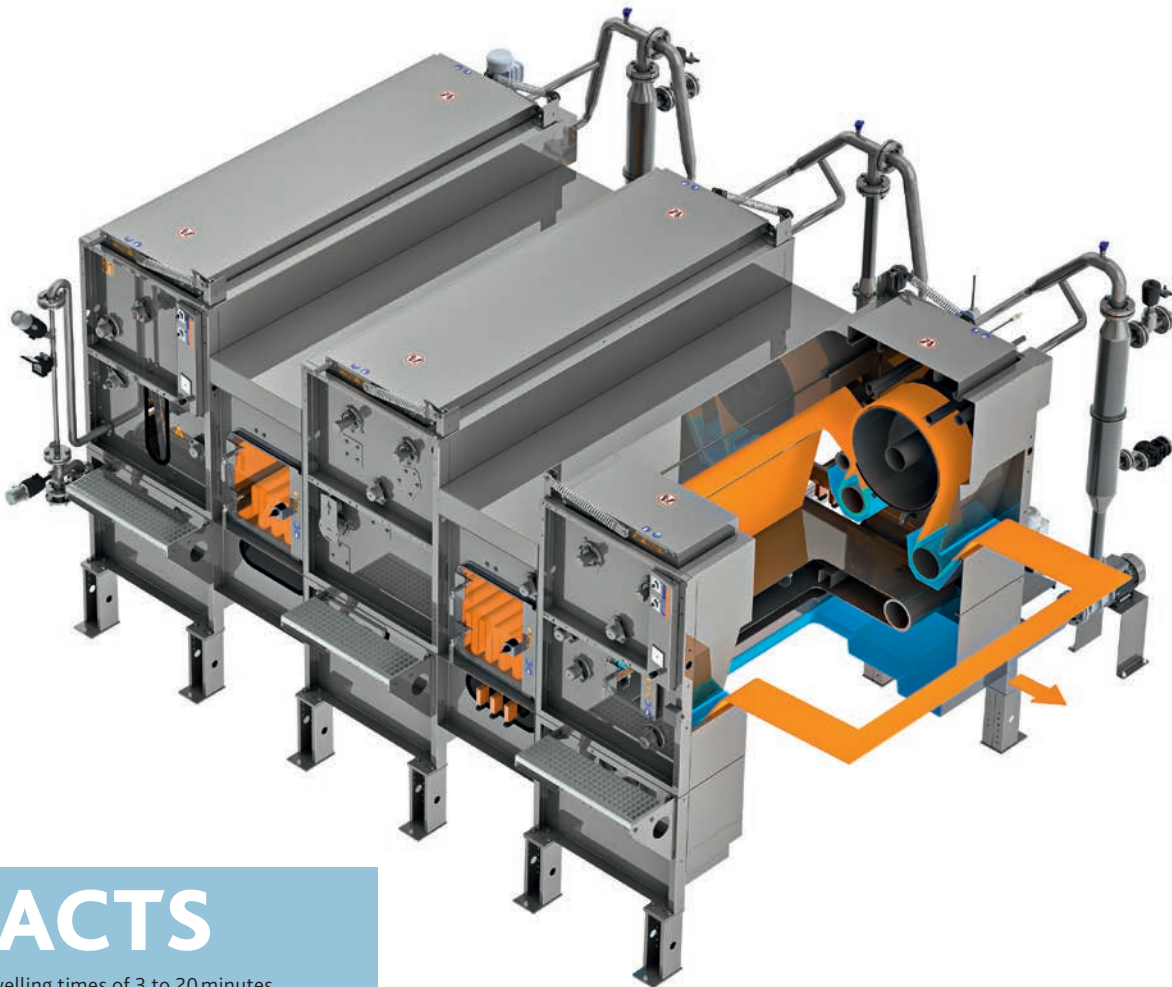
FACTS

- Washing in repeatable steps with liquor separation
- Calculable washing effect
- Low water and energy consumption
- Crease-free fabric run
- Steamtight
- Can be used for all high-performance washing tasks and also combined with waste water recycling or partial flow disposal
- Can be combined with all Benninger washing units

TEMPACTA

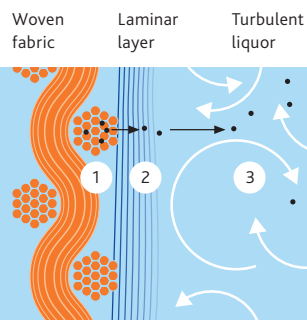
Washing through to the core

Washing and dwelling unit
for reaction, relaxation and soaping processes



FACTS

- Dwelling times of 3 to 20 minutes guarantee successful washing results
- Washing at boiling point
- Washing assistance or intermediate rinsing processes with drum washing technology
- Can be combined with steam blade for intensifying the mechanical washing effect
- High modularity
- Suitable for lightweight and thin fabrics as well as heavy fabrics
- Suitable for diffusion washing processes (fastness wash) and for relaxation
- Can be combined with all Benninger washing units



- 1 Migration from the core
- 2 Migration through the laminar layer
- 3 Hydrolisate discharge (evacuation)

WHAT ARE THE BENNINGER ADVANTAGES?

Benninger – your partner for textile finishing!

Technological competence

Benninger is distinguished by its comprehensive process know-how in both application consulting and project planning as well as by its close communication with customers throughout the entire life cycle of the installed plants. With its focus on engineering and a high standard of technical competence, Benninger is a recognized global pioneer in technology.

- High technology and application expertise
- Process consulting and project planning
- Sustainable resource management
- Carbon footprint
- Best available techniques (BAT)

System solutions

As the leader in its line of technology, Benninger provides competent advice and supplies innovative and effective product solutions to the required quality standard by the agreed deadline for a fair market price, backed by reliable, first class customer service.

- Complete product range (woven and knit)
- High process reliability and lower operating costs
- Performance guarantee / Payback calculation
- Technology trends and product innovation
- Premium-quality OEM components



After-sales service – full service

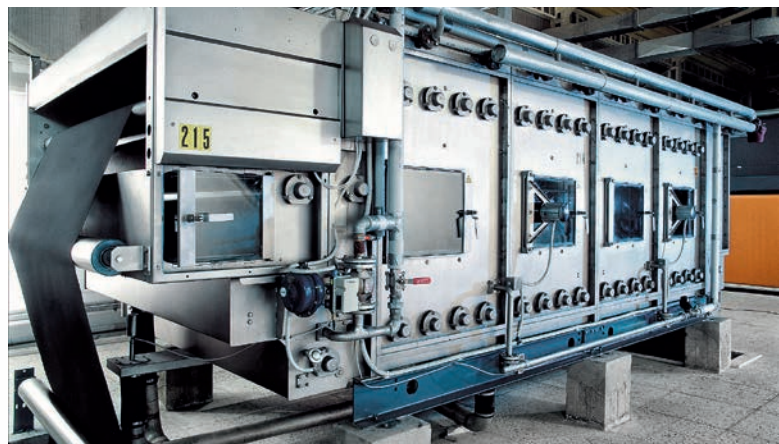
With Benninger you are always in good hands. Specialists are always at your disposal at the Benninger service centers and provide competent, prompt customer service. Regular maintenance by expert technicians minimizes unexpected downtimes and, as experienced instructors, they pass on their know-how. In addition, the specialized spare parts service team guarantees fast and reliable supply of original Benninger spare parts, rounding off the range of Benninger services.

- Customer-oriented service solutions
- Preventative maintenance (service contracts)
- Fast on-site service
- Competent help desk (software and hardware)
- Technical audits
- Customized modernization solutions
- Original Benninger spare parts (warranty)
- Customer training

Development cooperation and partnerships

Benninger is distinguished by its process and customer orientation, focus on the demands of the market and its customers, as well as continuous and systematic improvement. All this ensures customer confidence and satisfaction. Benninger – your partner for textile finishing!

- High specialist competence
- Consistent customer orientation
- Reliability and integrity
- Local representation in strategic markets
- Large number of reference installations
- Excellent reputation and long-standing customer relationships
- Goal-oriented development cooperation



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