Dyeing Solutions
Woven Line
Leader in wet textile finishing

**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

**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-COLOR**
The complete program for continuous and CPB dyeing
- High reproducibility
- Even dyeing results
- Low energy and water consumption
- High fastness properties
- No salt
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.

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.

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.

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
An optimum solution for every application

**Dyeing Solutions Process Workflow**

**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 CPB dyeing
Washing after Printing

High washing, water and rubbing fastness
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.
### 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

<table>
<thead>
<tr>
<th></th>
<th>8 BOOSTER</th>
<th>9 REACTAsteamer</th>
<th>10 EXTRACTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batching</td>
<td><strong>Rinsing and soaping</strong></td>
<td><strong>Rinsing and soaping</strong></td>
<td><strong>Rinsing and soaping</strong></td>
</tr>
<tr>
<td>Alkali</td>
<td><strong>Steaming</strong></td>
<td><strong>Rinsing and soaping</strong></td>
<td><strong>Rinsing and soaping</strong></td>
</tr>
<tr>
<td>Steaming</td>
<td><strong>Rinsing and soaping</strong></td>
<td><strong>Rinsing and soaping</strong></td>
<td><strong>Rinsing and soaping</strong></td>
</tr>
<tr>
<td>Reducing agent</td>
<td><strong>Steaming</strong></td>
<td><strong>Oxidation and soaping</strong></td>
<td><strong>Rinsing and soaping</strong></td>
</tr>
<tr>
<td>Reducing agent</td>
<td><strong>Steaming</strong></td>
<td><strong>Oxidation and soaping</strong></td>
<td><strong>Rinsing and soaping</strong></td>
</tr>
<tr>
<td>Reducing agent</td>
<td><strong>Steaming</strong></td>
<td><strong>Oxidation and soaping</strong></td>
<td><strong>Rinsing and soaping</strong></td>
</tr>
<tr>
<td>Reducing agent</td>
<td><strong>Steaming</strong></td>
<td><strong>Rinsing and soaping</strong></td>
<td><strong>Reductive cleaning and rinsing</strong></td>
</tr>
<tr>
<td>Reducing agent</td>
<td><strong>Steaming</strong></td>
<td></td>
<td><strong>Oxidation and soaping</strong></td>
</tr>
</tbody>
</table>
S-ROLLER TECHNOLOGY
Reproducible results

S-roller
Maximum correction range

Technical data

<table>
<thead>
<tr>
<th></th>
<th>333.11</th>
<th>333.17</th>
<th>222.20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of S-rollers</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Fabric width (mm)</td>
<td>1600–2600</td>
<td>2400–3600</td>
<td>3800–5200</td>
</tr>
<tr>
<td>Diameter of the S-rollers (mm)</td>
<td>220</td>
<td>300</td>
<td>350</td>
</tr>
<tr>
<td>Linear pressure (N/mm)</td>
<td>10–50</td>
<td>10–40</td>
<td>12–40</td>
</tr>
</tbody>
</table>
KÜSTERS DyePad
Dyeing without compromises

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

S-roller padder
Optimum padder configuration for all applications
<p><strong>BOOSTER</strong>
Controlled chemical application</p>

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

---

**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

---

**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.
**EXTRACTA**

High washing efficiency due to the multi-chamber system

**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**
- Dwell 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
Headquarters
Switzerland
Benninger AG
9240 Uzwil, Switzerland
T +41 71 955 85 85
F +41 71 955 87 47
info@benningergroup.com

China
Benninger Trading (Shanghai)
Co. Ltd.
Shanghai 200051, P.R. China
T +86 21 6237 1908
F +86 21 6237 1909
benchina@benningergroup.com

India
Benninger India
Private Ltd.
Mumbai 400 014, India
T +91 22 2417 5361
F +91 22 2417 5362
benindia@benningergroup.com

Germany
Küsters Textile GmbH
02763 Zittau, Germany
T +49 3583 83 0
F +49 3585 83 303
kuesters@benningergroup.com

Germany
Benninger Zell GmbH
79669 Zell i.W., Germany
T +49 7625 131 0
F +49 7625 131 298
tirecord@benningergroup.com

Germany
Benninger Automation GmbH
79669 Zell i.W., Germany
T +49 7625 131 0
F +49 7625 131 288
automation@benningergroup.com