Benninger

Customized textile solutions

BENNINGER

KÜSTERS
Member of the Benninger Group

Benninger AG

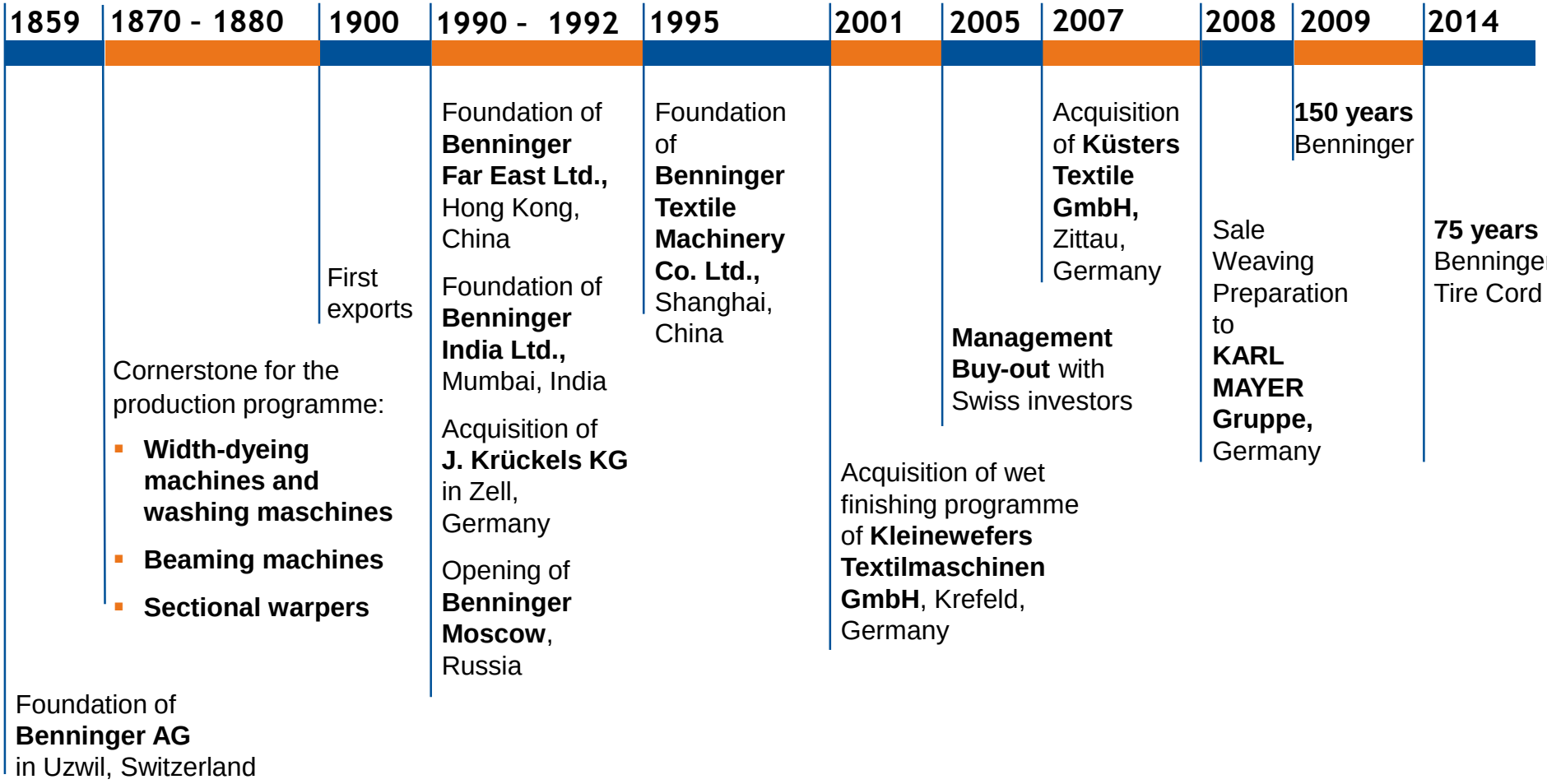
Tire Cord

Textile Finishing

Automation

A success story spanning more than 150 years

Future needs origin



Benninger Tire Cord

>75 Years of World-Class Tire Cord Dipping Lines

First tire cord line delivered in 1939 to Dunlop, Hanau, Germany

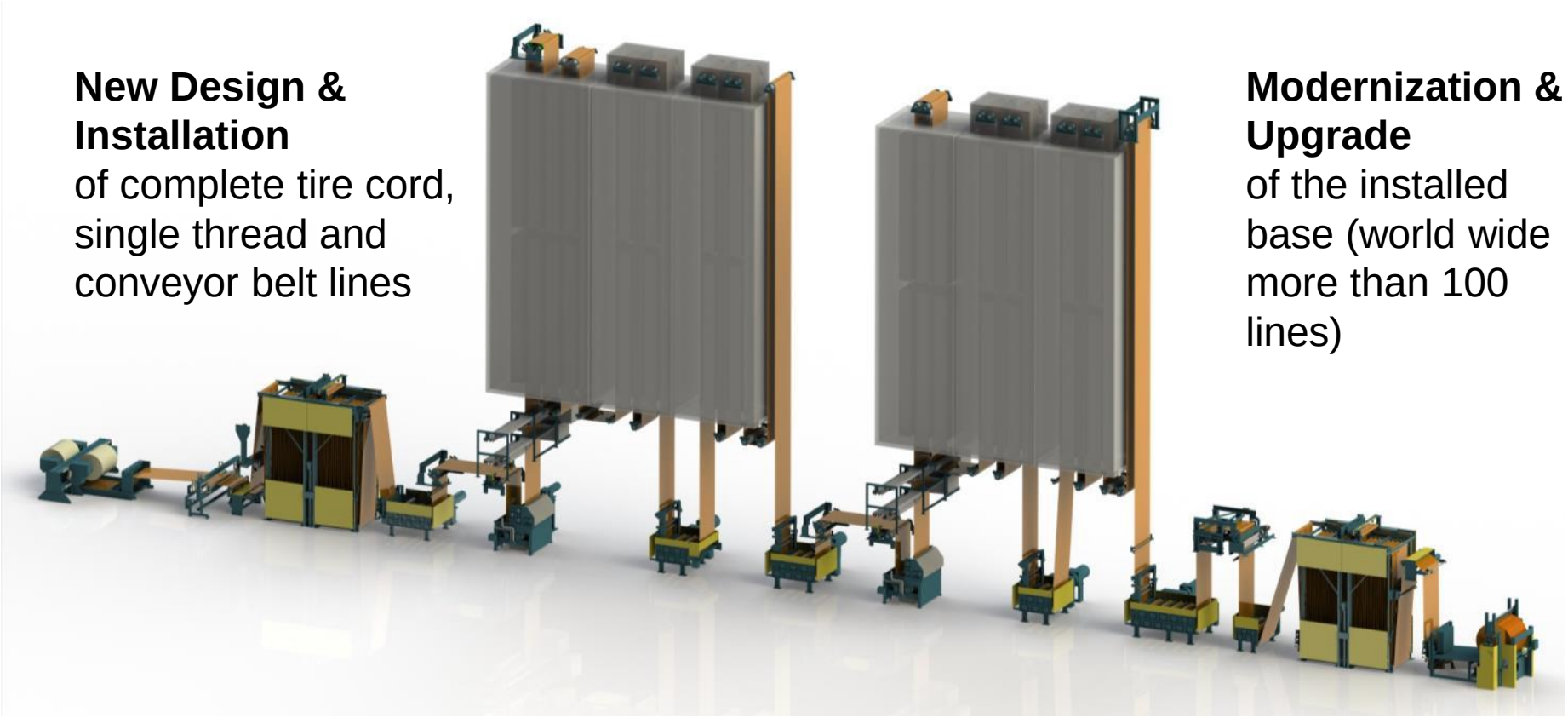
- Benninger Zell GmbH as TC Division of Benninger AG located in Zell, Germany
- The Leading provider of tire cord lines
- Approved by all named tire manufacturers
- Premium reliable lines for decades
- Highest level of safety standards
- Best in class control system and HMI

Reference customers for many years:

AB Svenskt Konstsilke · ITA · UNIROYAL · HELON POLYTEX · KOLON · CORDENKA · BRIDGESTONE · HYOSUNG CORPORATION · MICHELIN · Glanzstoff INDUSTRIES · WUXI TAIJI INDUSTRY CO.,LTD. · KORDÁRNA · HALEAD 海利得 · SABA Tire Cord · Tire Cord Co. · Continental Semperit, Uniroyal-Englebert · FORMOSA TAFFETA CO., LTD. · UNIFULL 尤夫股份 · PIRELLI Metzeler · OTIZ · 亚东工业(苏州)有限公司 ORIENTAL INDUSTRIES (SUZHOU) LTD. · MADURA INDUSTRIAL TEXTILES · KC · KIAN CORD Tire Cord Mfg. Co. · GRODNO KHIMVOLOKNO · GOODYEAR Kelly, Fulda · KORDSA GLOBAL · DUNLOP · OAO "Chernigovskoye KHIMVOLOKNO"

Benninger Tire Cord
Line and modernization business

New Design & Installation
of complete tire cord, single thread and conveyor belt lines



Modernization & Upgrade
of the installed base (world wide more than 100 lines)

Solutions for treatment of all technical textiles and applications (glass, carbon, etc.)

Mixing units for impregnating solutions and other chemicals

Calender accessories

BENNINGER Winding solutions

Optimized for a perfect fabric treatment

Let-Off solutions:

- solid design for heavy rolls (Ø 2 m, up to 2 tons)
- precise and constant tension control with AC motors
- minimized maintenance efforts
- conveyor belt feeding support
- roll diameter monitoring system

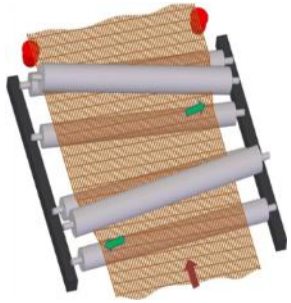
Wind-up solutions:

- own-weight decoupled of the raising-up fabric roll up to 2 tons
- "star free" edge build-up (L-shape)
- integrated guiding devices
- quick, easy and safe roll change by automatic kick-out function
- integrated crosscutting

BENNINGER Fabric Guiding Devices

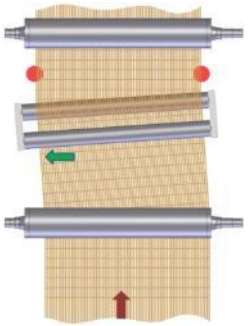
Highest precision for a perfect fabric quality

Full Width Spreader



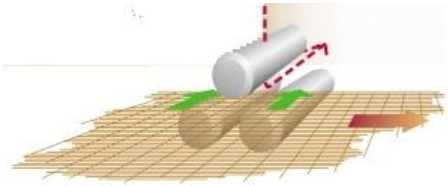
Spreading fabric under high tension in front of Pull Roll Stands and between Heating Zones

Center Guide



Keeps fabric in center at accumulator inlets and outlets as well as before the Winder

Trio Canter



Spreading fabric and keeping L-shape edges in front of each Dip Station and Winder

Duo Expander

Spreading fabric under low tension at low tension Pull Roll Stands and before Winder and big Accumulators

Textile Finishing
Leading wet processing technology




Benefits Textile Finishing

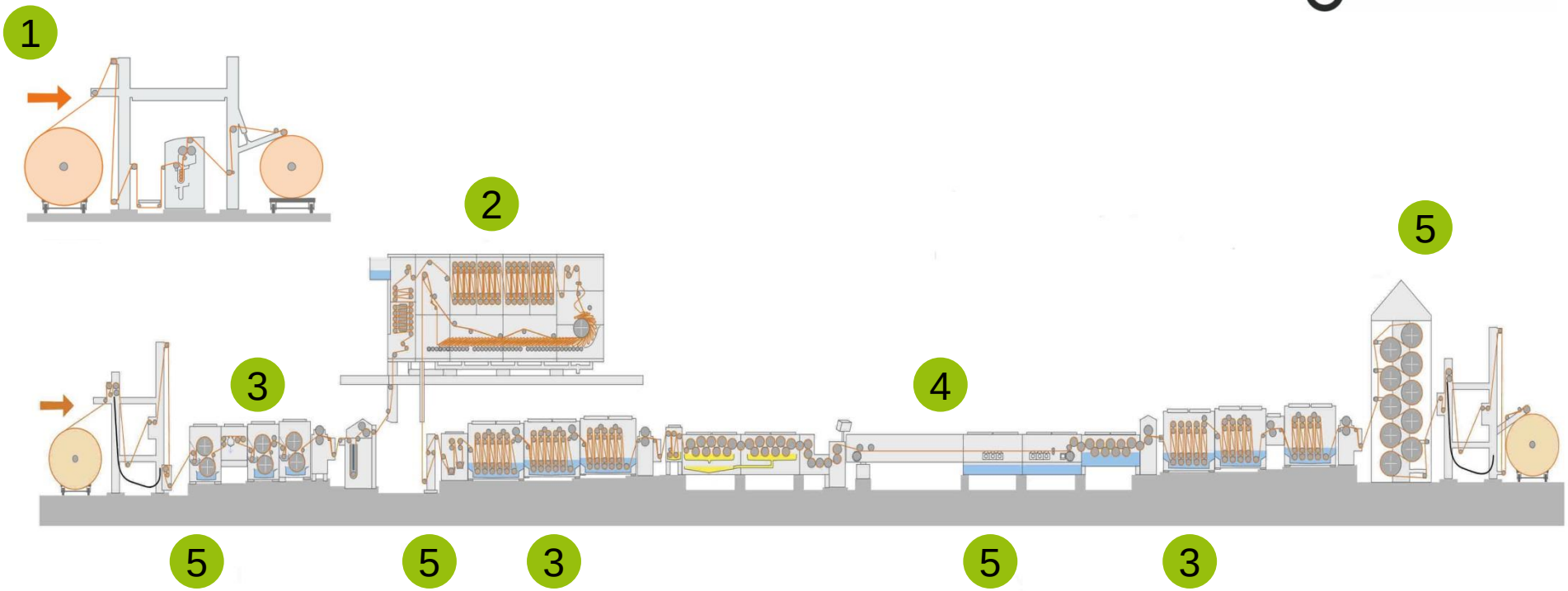
Top fabric quality at lowest possible production cost
Increased efficiency

Ensuring ecological standards

Lowest energy consumption

Always up-to-date with the latest scientific findings
Customized solutions to customer's individual needs

Benninger finishing solutions



1	CPB dyeing solution	5	Resource Management
2	Bleaching technology		- Heat recovery
3	Efficient washing technology		- Lye recovery
4	Mercerizing technology		- Waste water recovery

Textile Finishing

BEN-WASH

- Excellent washing performance
- Minimum water consumption
- High energy efficiency

BEN-COLOUR

- High reproducability
- Even dyeing results
- Low energy consumption (CPB)

BEN-BLEACH

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

Textile Finishing

BEN-DIMENSA

- Improved dimensional stability
- Higher dye yield
- High lustre level
- For woven fabric and knitwear

BEN-ECO

- Caustic recovery system
- Heat recovery system
- Waste water recycling and «zero discharge» solutions
- Energy-efficient drive technology

Textile Finishing

KNIT-LINE

- Smoother, glossy fabric surface
- 25-30% lower variable costs
- CPB dyeing with reactive dyes possible
- High productivity (25 tons/d)
- No enzyme treatment necessary
- Crease-free relaxation of synthetic and elastane fibres

TECHNICAL TEXTILES

- Up to 5400 mm fabric width
- Crease-free
- Suitable for woven, knit and non-woven
- Controlled fabric shrinkage
- Excellent washing effect

Why Benninger?

Core competences	- Comprehensive process know-how including process consulting and project planning - Innovative and reliable products - Customer-focused service through start-up support and individual problem solutions
Sustainability	- Investing in the development of high-quality products - Ecologically responsible processes (recycling of waste water, reduction of waste heat and precious raw material)
Tradition	- Long established Swiss company with a global presence and its own branches in Asia's and Europe's most important markets

Thank you for your attention!!