

Fiber and spinning  
preparation for

# recycled materials



# Sustainable yarn

Giving new life to textile waste reduces the environmental impact of our industry – and can provide attractive business models. Trützschler is able to provide a complete line-up of technologically leading machinery that is specifically developed for rotor and ring yarns from recycled materials.

Thanks to our partnership with Balkan Textile Machinery. INC.CO, we are closing the loop and supporting a circular economy by becoming the first full-liner in spinning preparation for recycling. Balkan's machines help to cut, mix and tear textile waste into fiber tufts that are then pressed into bales of secondary fibers which can be fed into the preparation process with Trützschler machines. Customers benefit from combined, perfectly finetuned, reliable and reproducible processes.



**truecycled**®



Get more info  
about TRUECYCLED  
on our website

## Top-notch fabric recycling

TRUECYCLED stands for state-of-the-art recycling installations from Trützschler that enable manufacturers to achieve a high-quality end-product from hard waste. The reproducible manufacturing process is based on Trützschler's technological recommendations and a Trützschler machinery line-up that ensures ideal results from recycled materials.





In a recent collaboration with a fashion company that aimed to make use of pre-consumer waste, Trützschler achieved a ring yarn containing 60% pre-consumer waste. A true TRUECYCLED product! Trützschler customers and partners can use the TRUECYCLED brand for both the process and the end-product, as long as it contains a significant amount of textile waste.

### Recycling of PET bottles

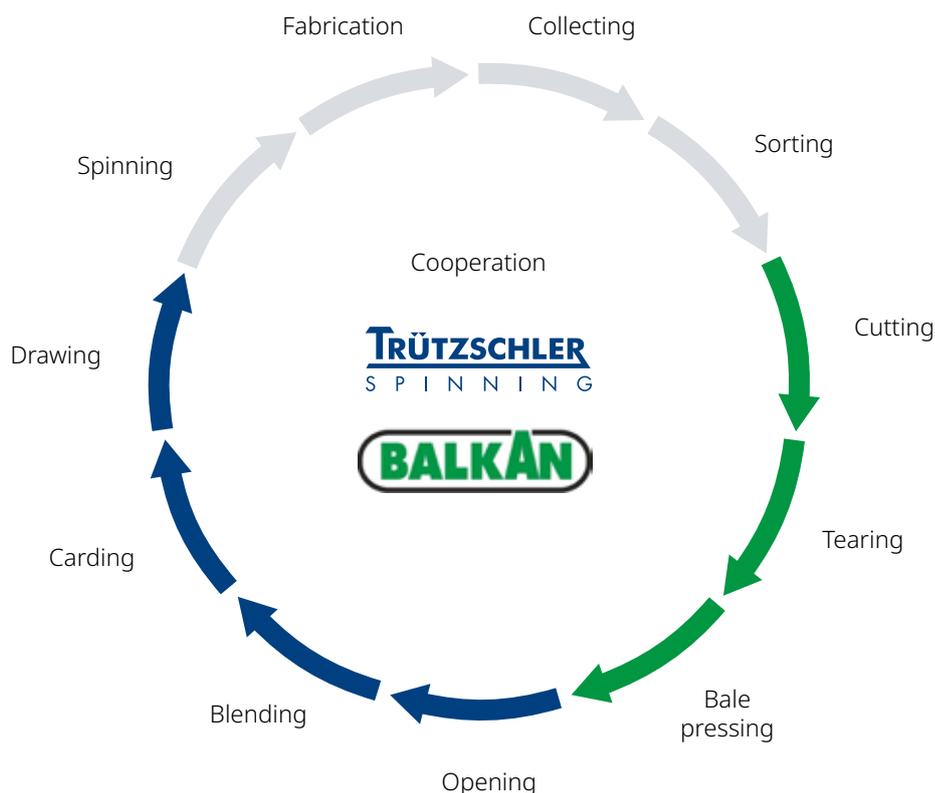
PET bottles can be shredded into flakes and the polymers can then be dissolved by melting. These dissolved polymers form the pulp that is used to produce new fibers or directly produce a new web. These reclaimed fibers can be processed on Trützschler spinning and nonwovens systems, just like virgin polyester.



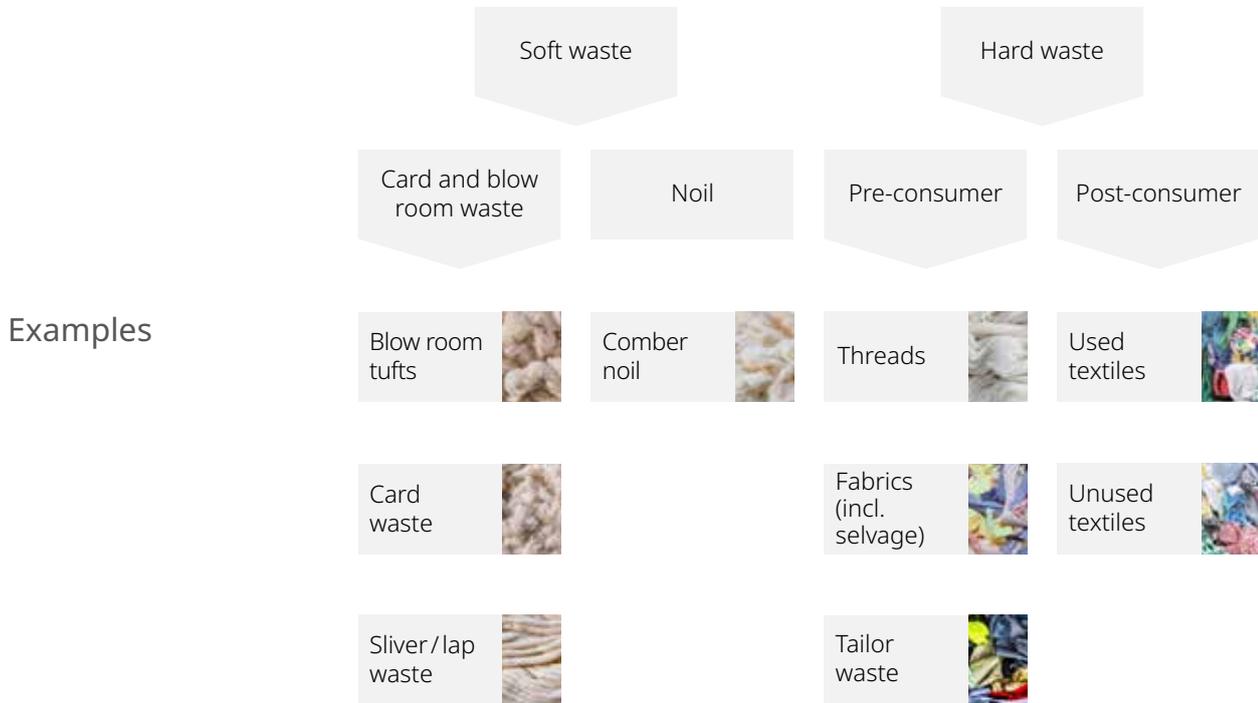
# Creating clarity for recycling

Upcycling, recycling, better utilization of raw materials... These are big buzzwords right now – but what do they really mean? For Trützschler, sustainability begins with preventing unnecessary cotton waste in spinning preparation using WASTECONTROL sensor technology. Trützschler machines also make it possible to utilize even highly soiled cotton separations (like those from the blowroom) for yarn manufacturing. Used and unused textiles are becoming an economical and sought-after raw material because they can be reprocessed into quality yarns with our technology.

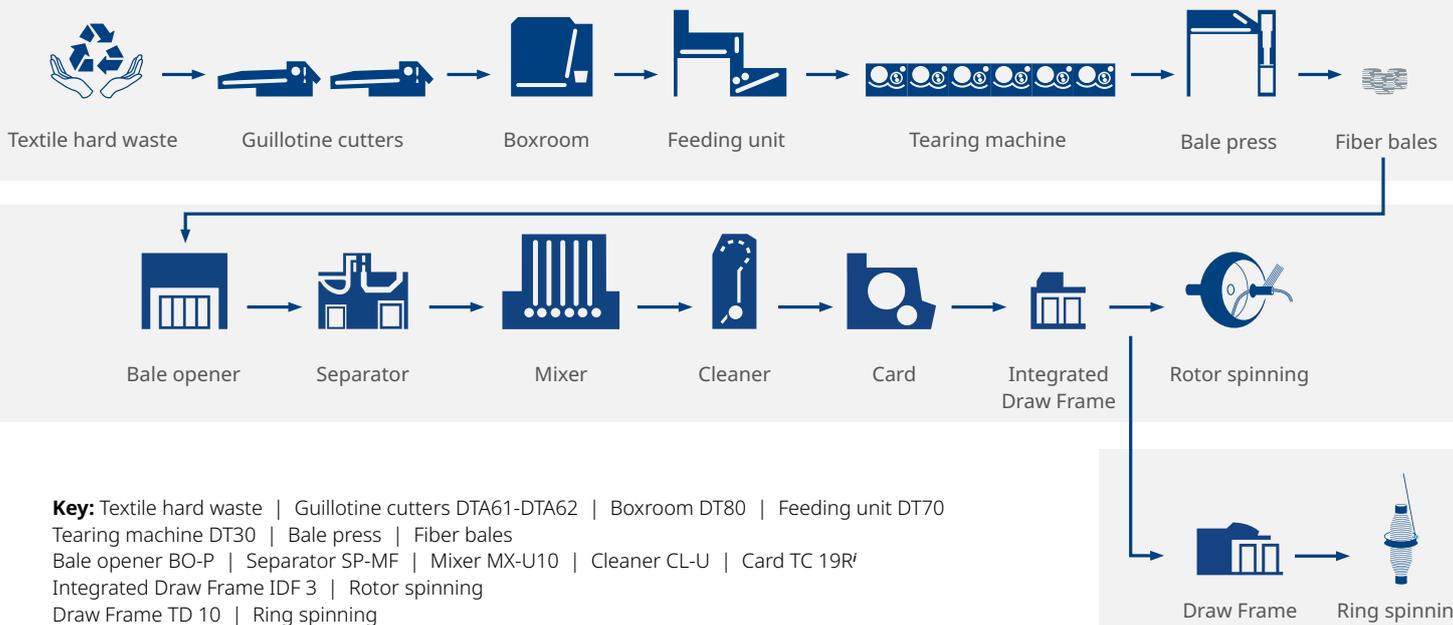
## Textile circular economy



## Type of textile waste



## An example of a state-of-the-art recycling process



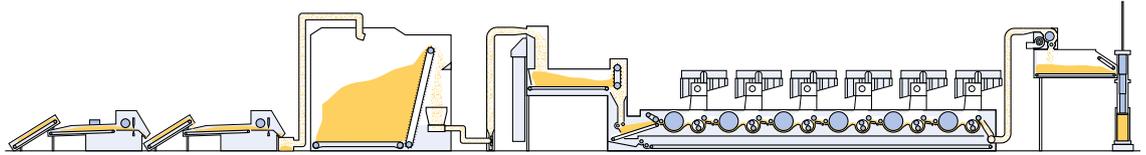
# A true match

## Trützschler and Balkan combine expertise for textile recycling

The cooperation with Balkan Textile Machinery.INC.CO completes our product portfolio for recycling by cutting, tearing and bale pressing solutions. This makes us the first full-liner in spinning preparation for recycling!

Thanks to our combined machinery expertise and technological knowledge, our customers can produce yarns at the highest possible quality level – and literally turn waste into value.





## Structure of a tearing line

The first step is the cutting of the textile hard waste. The starting material is cut into small pieces of fabric by two guillotine cutters. In a box room, the material is homogenized and stored in batches. The material is then evenly fed into the

tearing machine via the feeding unit. The material is disintegrated into fiber tufts via six cylinders that are equipped with needle bars. The fiber tufts are finally sucked off after the tearing machine and pressed in a bale press.



### Cutting

Two guillotine cutters cut the textile hard waste to the required size for the tearing machine. The first guillotine cutter is equipped with a metal detector. The second guillotine cutter stands 90° offset to the first one. This makes sure uniform pieces of fabric are cut.



### Tearing

The major machine of the tearing line consists of six tearing cylinders. With rising numbers of needle pins, the textile hard waste is gradually dissolved into fiber tufts. Speeds and distances can be adapted to the material.

# Optimum opening, cleaning & blending of secondary fibers

## Blowroom lines for recycling textile waste

The technological challenges in the processing of secondary fibers from shredded textile waste are considerable: All particles of yarn and woven fabric must be opened reliably or separated off. Trützschler blowroom lines for recycling feature flexible setting options and intelligent processes, facilitating perfect opening, cleaning and blending of synthetic and cotton secondary fibers. They also prevent unnecessary waste or new short fibers from being produced.



### Portal Bale Opener BO-P

25 – 40 % better blending: The Portal Bale Opener provides very large working widths of 2,900 mm and 3,500 mm for 5 to 6 bales next to each other. The two opening rolls with higher teeth density produces smaller tufts for a gentle opening process. This is the perfect foundation for homogeneous blending in the blowroom.



### Proper protection for lines: Multi Functional Separator SP-MF

Adding waste significantly increases the risk of foreign parts in the material. The SP-MF reliably detects heavy parts as well as metal parts and separates them off. If required, it can also be equipped with spark detection and extinguishing.



Maximum process reliability





### The perfect blend with Universal Mixer MX-U 10

The Mixer MX-U 10 features 10 chambers which are filled from above one by one and emptied simultaneously from below with 10 individual opening units. This principle guarantees that the blend has maximum homogeneity. It runs highly efficiently thanks to a closed air circuit which also uses the conveying air to transfer the tufts at the same time.



### Universal Cleaner CL-U, stainless steel version

This cleaner can be used for almost all types of cotton. It features integrated dust extraction which is important for rotor spinning. All material carrying parts are made of high-grade stainless steel. This equipment prevents the accumulation of reviving agent and thus makes for significantly more reliable fiber conveying.

**INOX**

Stainless steel equipment for reduced adhesion of reviving agent

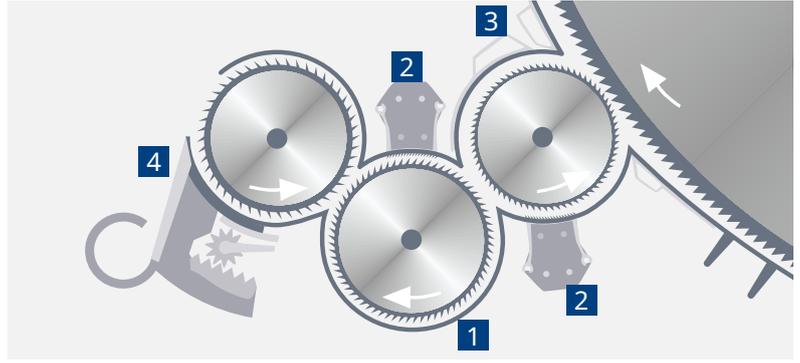


# Using textile waste intelligently

## The intelligent Card TC 19R<sup>i</sup> for Recycling

Spinning straw into gold? That's only possible in fairy tales. However, using textile waste to create new values is now reality: The intelligent Card TC 19R<sup>i</sup> for Recycling converts shredded textile waste into quality fiber slivers for new yarns.





## More quality and productivity

The intelligent card TC 19R<sup>i</sup> with the Gap Optimizer T-GO for Recycling automatically and precisely sets the carding gap to ideally suit the respective changing production conditions. The results achieved by customers show that this leads to quality and productivity increases in a double-digit percentage range.

## Gentle and effective tuft opening

The licker-in unit WEBFEED, with clothing licker-ins specifically developed for recycling, fixed carding segments and profile geometries, makes for optimum opening and cleaning of tufts from secondary fibers. The recycling blade improves the separation of foreign bodies and minimizes the loss of fibers suitable for spinning.

- 1 Three licker-ins with special clothings for recycling
- 2 Carding segments
- 3 Coated profiles with special geometry for recycling
- 4 Special mote knife for recycling



## Rugged and reliable in every application

Shredded waste can affect material-carrying components and lead to fiber adhesions and blockages. On the TC 19R<sup>i</sup> for Recycling this is unlikely: All material-carrying components are made of stainless steel. At the same time, the rugged construction guarantees reliable performance in demanding applications.

**INOX**

Stainless steel equipment for reduced adhesion of reviving agent



## Individual and flexible

The MULTI WEBCLEAN system facilitates quick, flexible and individual adjustment to different recycling applications. In the pre-carding and post-carding zones of the main cylinder, eight elements can be configured variably as carding strip, cover section or cleaning element with suction hood.



## Well advised and perfectly set

Trützschler has years of experience in textiles recycling. Our installations are characterized by particularly variable setting options. We support our customers with recommendations for ideal configurations and clothings.

# Clothings for recycling

## As individual as your application

The wide range of clothings from Trützschler Card Clothing has been specially developed and tailored for Trützschler machines and the designated applications. The high performance of the card TC 19R<sup>i</sup> for Recycling cannot be achieved without Trützschler clothings. Different aspects of the clothings are key, depending on which recycled material is to be processed.

### Requirements for shredded textile waste

The clothings can become clogged with fibers as a result of the different level of pre-opening of the recycled materials. This can be prevented with the right clothings with the appropriate front angle. Non-opened yarn or surface pieces can otherwise lead to poor yarn quality and, in the worst case, machine damage. When it comes to hard waste the long-term stability of the flat clothing plays a particularly important role. Thanks to the special manufacturing processes, clothings made by Trützschler Card Clothing achieve a durability unrivalled on the market.

### Suitable cylinder wires for recycling applications include

- T25.20.070.0636.12/X2 for high resistance and long lifetime
- T25.25.060.0727.13/X2 as the allrounder for high production speeds
- T20.25.050.0806.07/X2 for medium production speeds
- T17.30.050.0860.05/X2 for high quality applications





### Durability of clothings

By using high-strength steels for the clothings and constantly developing production processes further we ensure that the clothings have a long service life which measures up to the constantly improving production performance of our cards. The name SUPERTIP stands for this durability.



### Large range for various recycling applications – individual and flexible adjustment

Close cooperation with our customers and our global experience when it comes to the selection and use of our clothings has led to a specification depth which facilitates the individual selection of clothings for every application in the field of recycling.

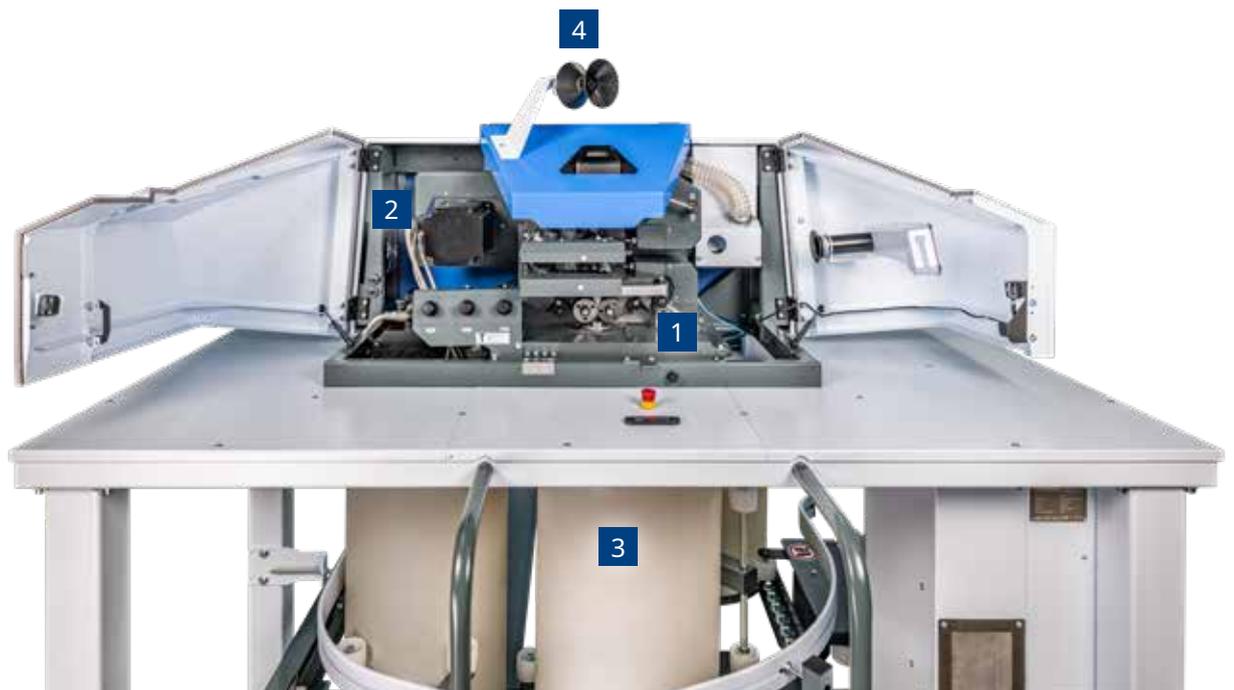


### Latest developments

The latest developments include a specially designed cylinder clothing T20.20.060.0717.07/X2 for high content of cotton (virgin / recycled), a particularly stable flat top PRECISETOP 45R for coarse yarns and a high content of recycled material (also available in CLASSICTOP and MAGNOTOP version) and carding strips with specially designed tooth geometry for a high and stable carding performance, even with demanding recycled materials.

# New generation: The IDF 3

IDF 3 offers a range of innovative features that give customers even better quality, efficiency and handling – as well as accelerated can change times and improved productivity.



The new measuring system



Easy accessibility to everything



Can changer becomes a game-changer



QUICK START saves valuable time during automatic piecing



## The shortest path to perfect yarn quality

With its gentle and secure fiber guidance while drafting, the IDF 3 delivers perfectly homogeneous sliver. This further stabilizes the drafting process and significantly reduces yarn imperfections.



## Higher productivity, lower costs

Can changing speeds stay at the high level of 300 m/min – resulting in four-times faster delivery speed during can change and 3% efficiency increase. Operating costs are reduced due to decreased consumption of compressed air.



## Easier than ever to operate

Save time for the things that matter: QUICK START the IDF 3 after sliver breaks. The user-focused new design allows easy access to every part because the IDF opens up fully.





# The seamless access to your digital world of Trützschler

With our innovative digital solutions and unparalleled service, you are ready to take your production processes to the next level. Our single sign-on feature gives you complete access to all of our services without the hassle of multiple logins. Our apps work together to make your life easier and more efficient. Try our platform and experience the convenience of having everything you need in one place!

## My Mill

Save time and costs with quick data collection and background monitoring that enables you to focus on things that really need your attention. Transparent data analysis and internal benchmarking improve performance and reduce maintenance needs. Make data-based decisions and optimize your processes!

## My Wires

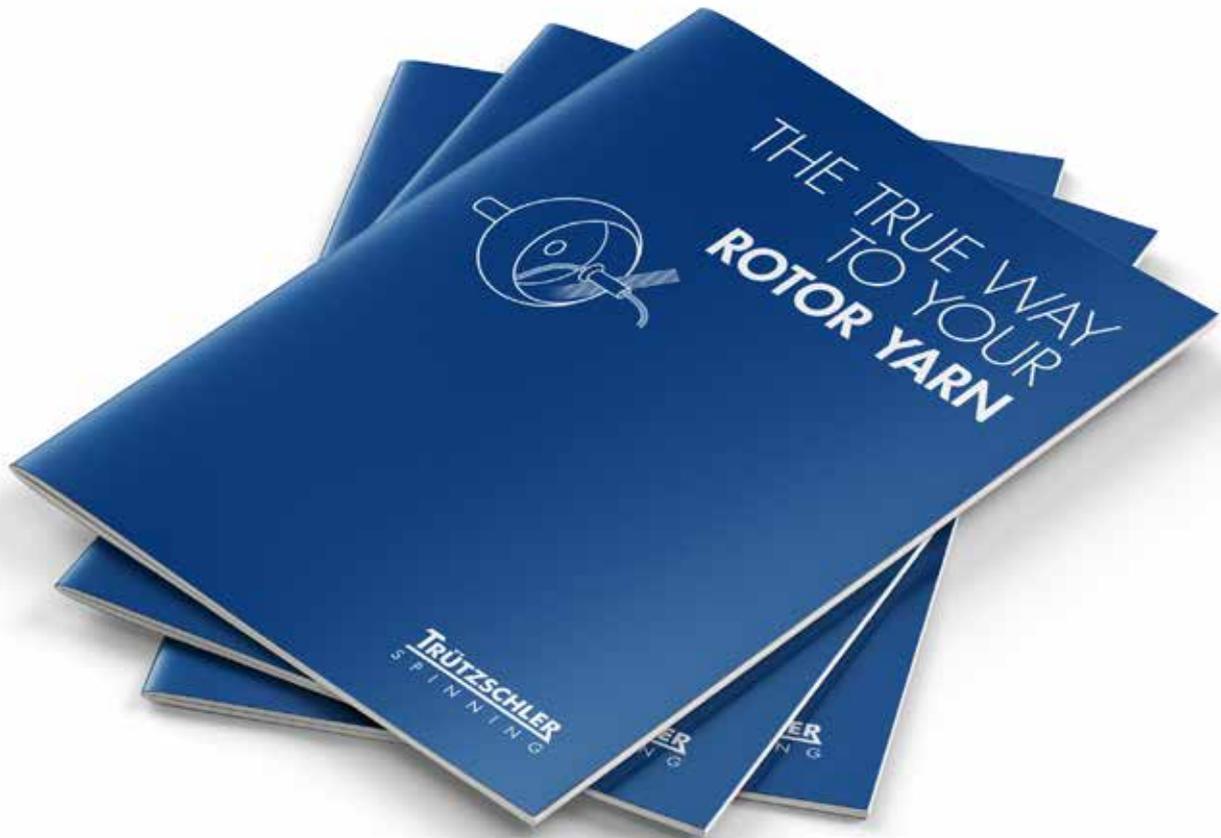
Don't get your wires crossed: Digitize your clothing management in just a few minutes, from clothing condition to service and maintenance. Best of all: It's free of charge! Automatically track your wire wearing, no matter which manufacturer you bought it from. Plan your maintenance efficiently and organize repeat orders with ease.

## Training

Speed up troubleshooting of machine downtimes with our new online training platform. It enhances your skills quickly from anywhere, anytime to unlock the full potential of your machines.

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**TRÜTZSCHLER**  
S P I N N I N G

Fiber preparation installations: Tearing line · Bale openers · Mixers  
Cleaners/Openers · Foreign part separators · Dust separators · Tuft blenders  
Waste cleaners | Cards | Draw frames | Combing machines |  
Digital Solutions

**TRÜTZSCHLER**  
N O N W O V E N S

Bale openers/mixers | Card feeders | Cards/crosslappers  
Wet-laying lines | Hydroentangling, needle-punching, thermo- and  
chemical bonding lines | Finishing, drying, winding machinery |  
Digital Solutions

**TRÜTZSCHLER**  
M A N - M A D E F I B E R S

Carpet yarn systems (BCF) · Industrial yarn systems |  
Digital Solutions

**TRÜTZSCHLER**  
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Metallic wires: Cards · Cards long staple · Cards Nonwovens  
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