



Nonwovens  
Hydroentanglement Systems



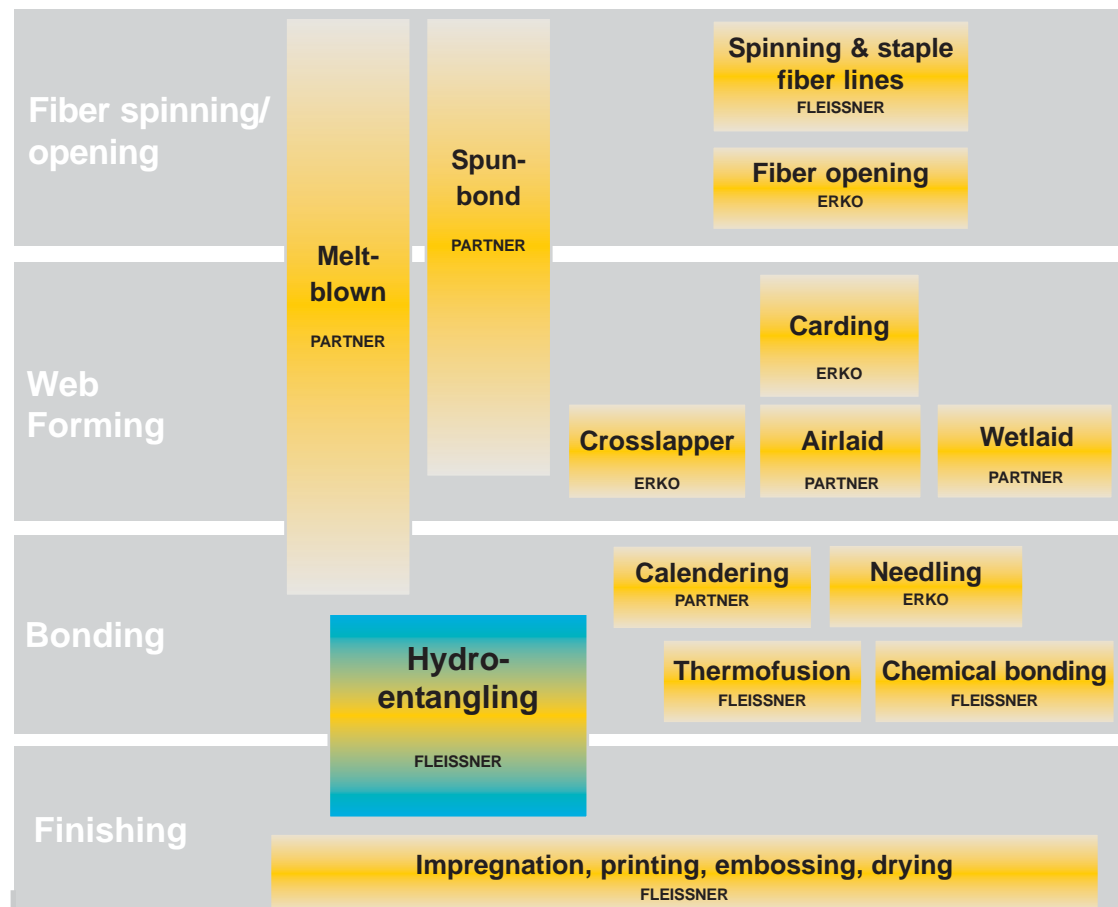
**HELIXNER**



## Hydroentangling Process

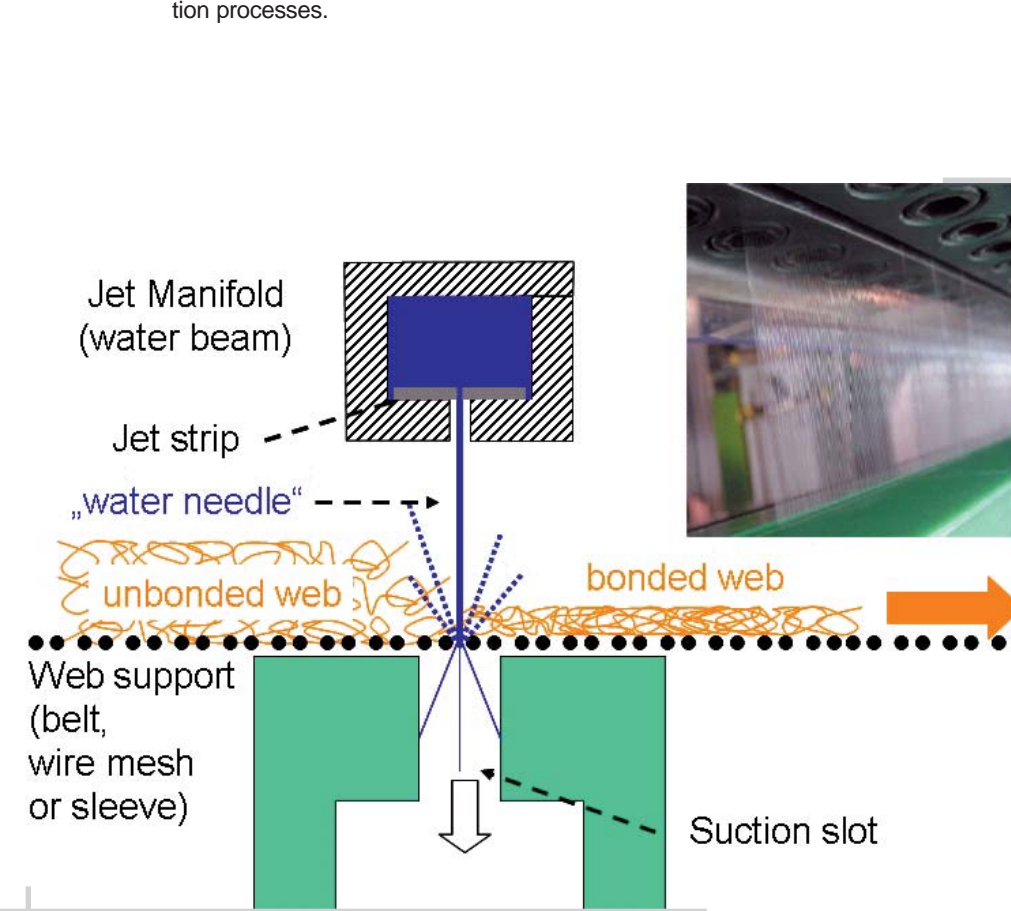
In the world of nonwovens processing Fleissner and the entire Trützschler Group provide you with an almost complete product portfolio. Whereas ERKO is strong in opening and web forming, Fleissner is market leader for bonding and finishing equipment. With more than 10 years' experience and 80 industrial installations, the Fleissner hydroentanglement technology will provide our customers with the finest products for the demands of their markets.

Almost any combination of material is possible. Hydroentangling is more than just bonding, it will create individual products for our customers with the innovative Fleissner shells for perforation, embossing or structuring of their choice.



## Functional Principle

Special pumps generate water pressures of up to 400 bar. The water is equally distributed in jet manifolds of the required working width and fed through jet strips with holes of less than 0.15 mm, forming a water curtain. The water jets hit the unbonded web with a velocity of up to 350 m/s. Water is sucked through nonwovens/textiles and subsequently recycled in individually designed filtration processes.



Water

**Spunlace Products -  
Soft, strong and  
environmentally  
friendly**

# Products



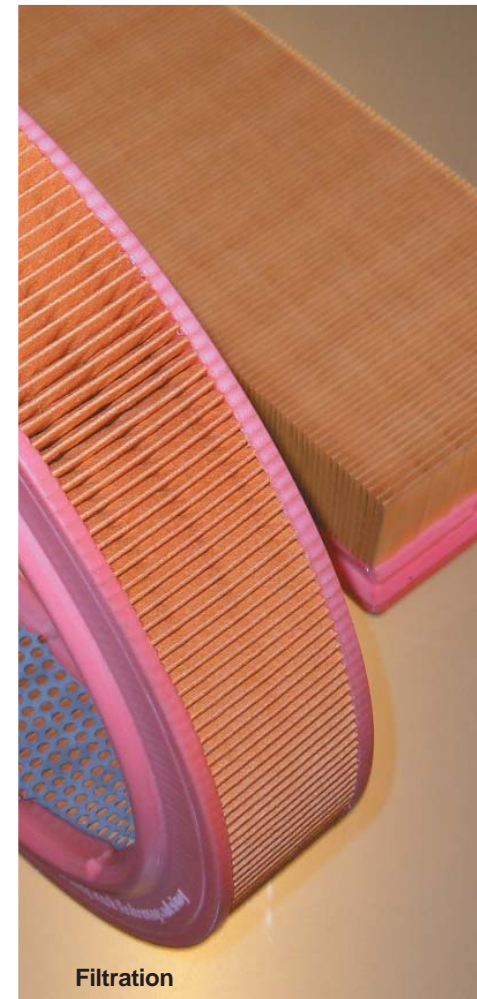
Cotton Pads



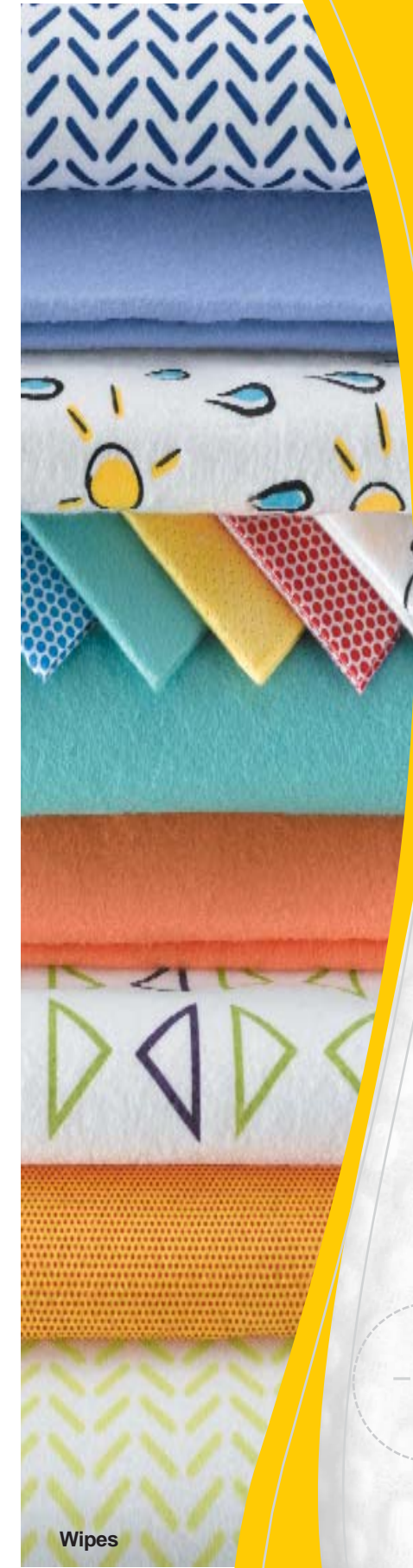
Interlinings



Synthetic  
Leather



Filtration



Wipes



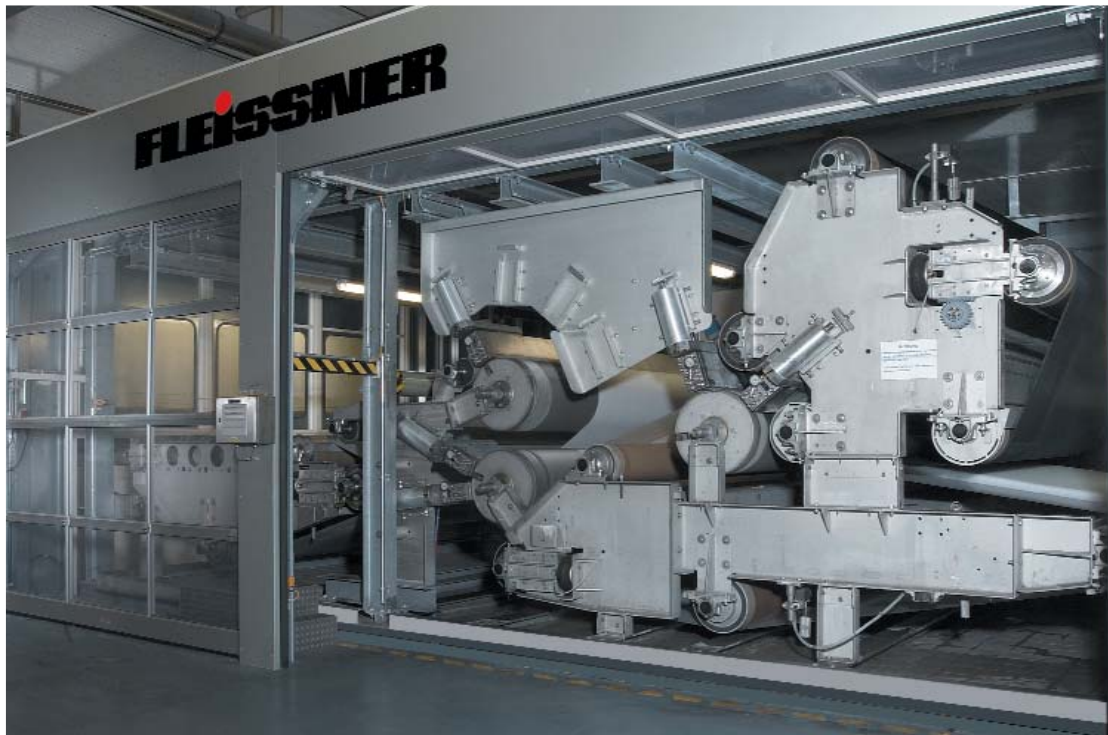
Automotive industry



Medical products



Hygienic products



Fleissner AquaJet of 3.6 m working width for polyester and polyester blends of medium and heavy weight. The line consists of opening, card, crosslapper, AquaJet, dryer, winder. Applications are multipurpose such as automotive, filtration and others.

# Production lines **AquaJet**



Fleissner AquaJet of 3.6 m working width for the production of two layer products and special wipes with unwinder on top.



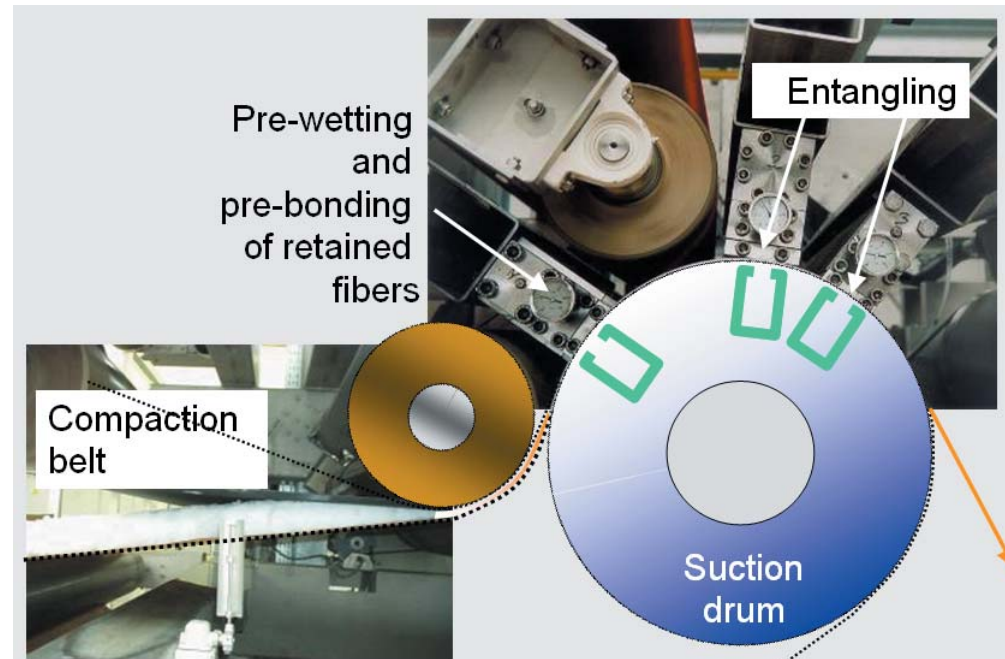
Fleissner AquaJet of 3.6 m working width for a two layer product of medium weight consisting of an electro spun nanoweb and a polyester (splittable fiber type) web. Applications are artificial leather and premium sports textiles.

## FLEISSNER AquaJet

The AquaJet was first sold more than 10 years ago and has since been used for bonding of all kinds of nonwovens from low to very heavy weights.

The advantages of the Fleissner technology and specific benefits for the customers are as follows:

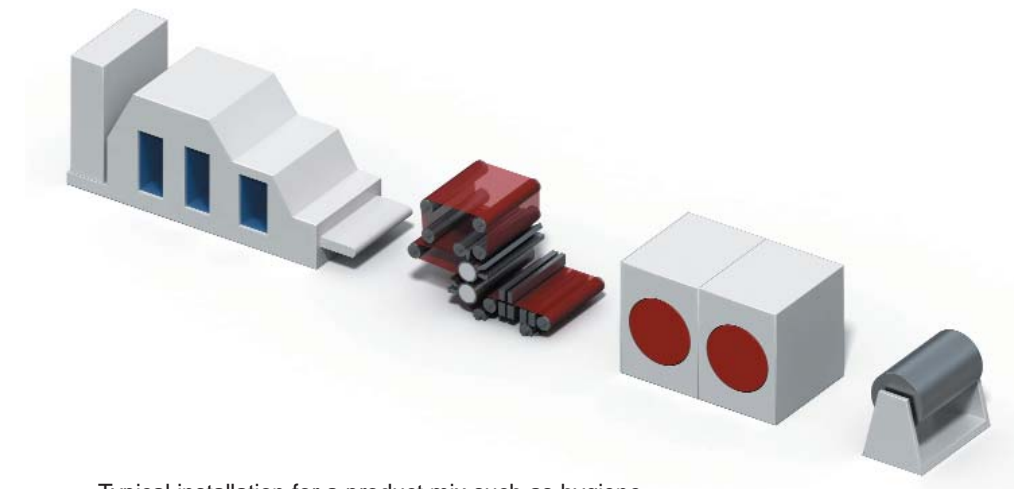
- Great experience proven through more than 80 installations worldwide
- Weight range from 20 to 800 g/m<sup>2</sup>
- Nonwovens from natural fibers, synthetic fibers and spunbond webs
- Standard speed range from 5 to 300 m/min, speeds of up to 900 m/min are possible for spunbond applications
- The only worldwide installation with working widths of more than 5 m is operated with FLEISSNER Jumbo AquaJet
- Max. pressures up to 400 bar
- Working widths range from 1.2 m to 5.4 m, with standards at 1.2 m, 1.8 m, 2.6 m, 3.0 m, 3.2 m, 3.6 m, 3.8 m, 4.35 m
- Max. entangling steps: Belt 1, Drum 1, Drum 2, Drum 3, Drum 4, Belt 2, special configurations with standard components are possible
- Preferred design for heavy weights is the patented FLEISSNER-belt-drum compaction system
- Standard belt-belt compaction up to 120 gsm



## Production lines for carded nonwovens based on Fleissner AquaJet technology

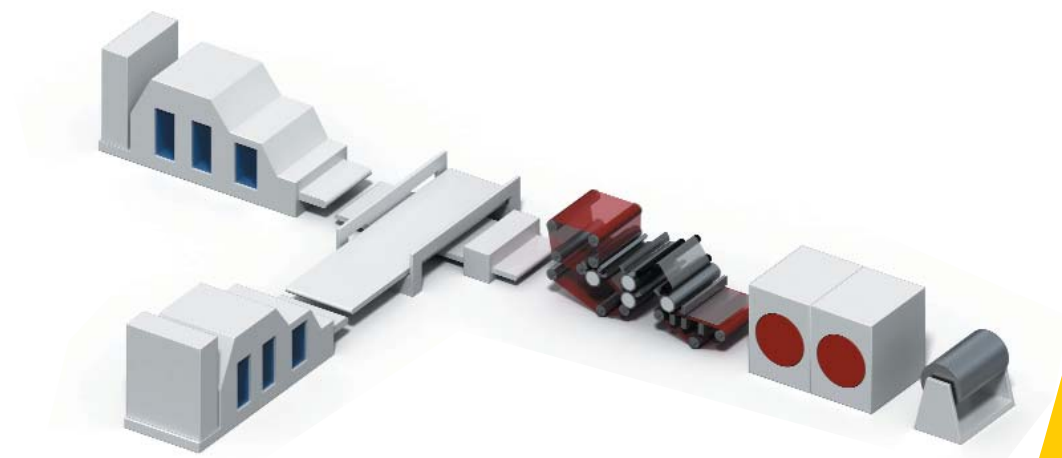
Typical installation for wipes (low weight, high speed, high throughput)  
TRÜTZSCHLER group is capable of supplying fiber opening and carding (ERKO) as well as hydroentanglement and dryer (FLEISSNER)

### 1 or more Inline card(s)



Typical installation for a product mix such as hygiene, sanitary, technical applications (medium and heavy weight, medium speed)

### 1 or more card(s) with crosslapper(s)

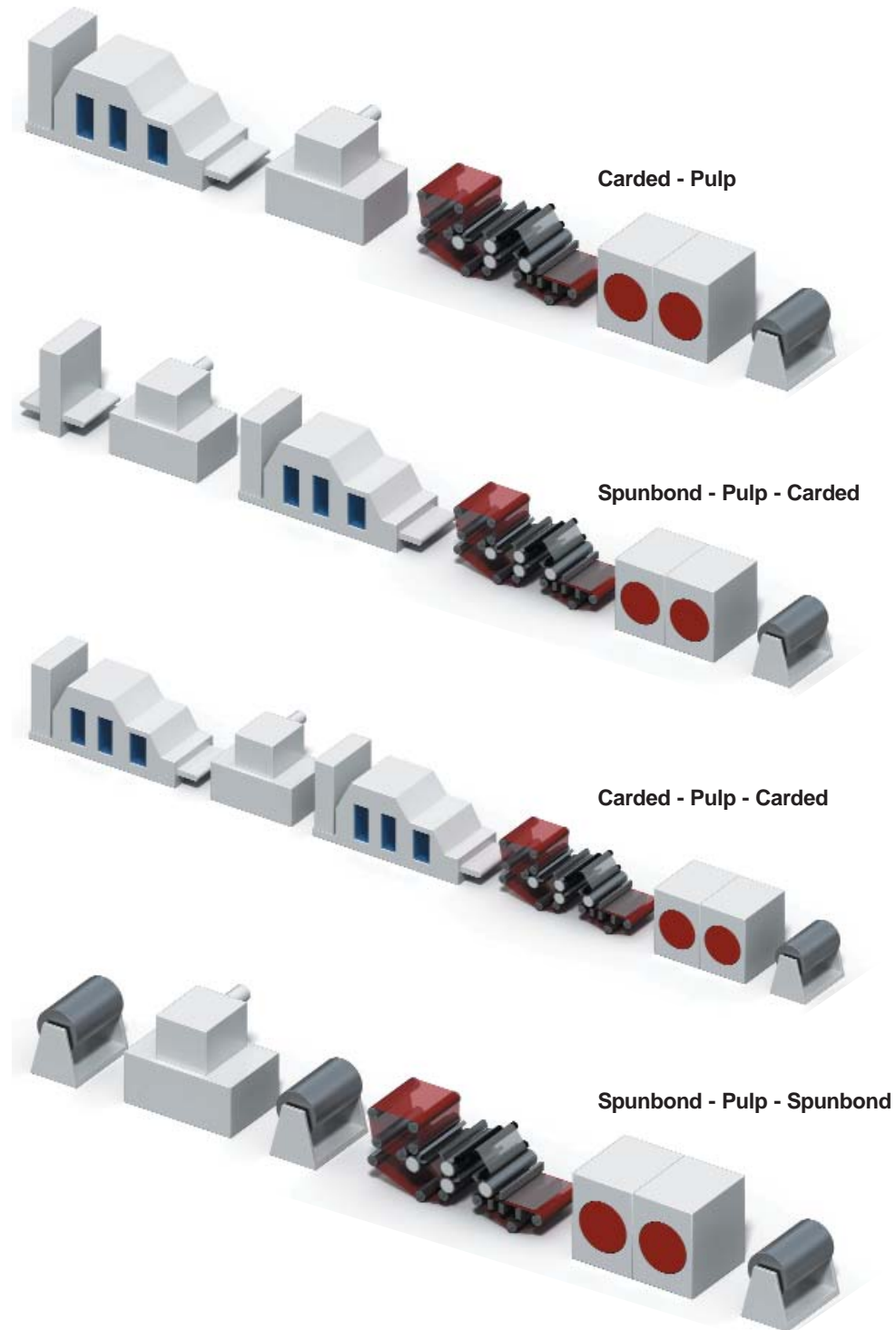


Lines

Spunlace  
AquaJet

## Production lines for multilayer nonwovens containing pulp based on Fleissner AquaJet technology

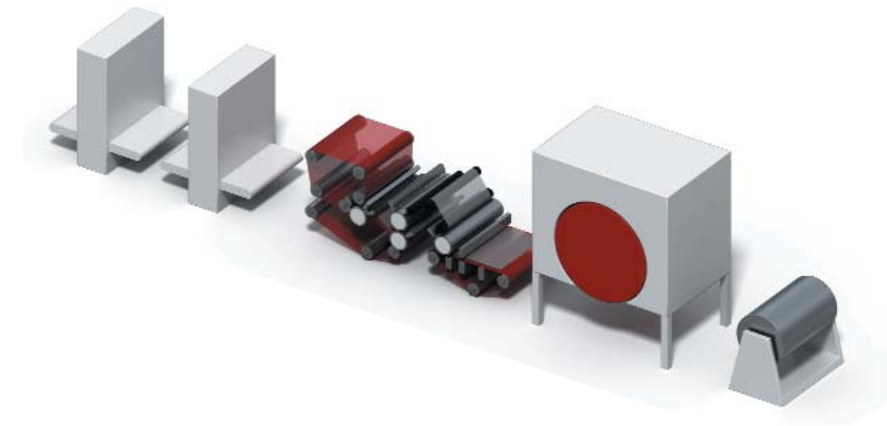
Typical applications are wipes and wet wipes at low weight and high speed



# Multilayer

## Fleissner Spunlace lines for spunbond webs

Characterized by extreme high speeds of up to 900 m/min at low weights for hygiene, agricultural and special applications with enhanced properties (softness) of the products



## Fleissner Spunlace lines for natural fibers e.g. cotton

- Waste recovery machinery for cotton from spinning mills (TRÜTZSCHLER)
- Bleaching and drying machinery of cotton (FLEISSNER)
- Opening of bleached cotton (ERKO)
- Web forming machinery (TRÜTZSCHLER or ERKO)
- Hydroentanglement (FLEISSNER)
- Drying (FLEISSNER)

## Fleissner Spunlace lines for special and innovative products

- Hydroentanglement of splittable PET or textiles and nanoweb
- Hydrospace applications
- Tissue applications
- Composites of textiles and nonwovens
- Hydroentanglement of geotextiles and roofing felts

## FLEISSNER LeanJet

The Fleissner LeanJet was newly designed for reduced production capacities at lower investment costs while maintaining a high web quality. Several of these lines are operating successfully, being characterized by the following features:

- Designed for one card before the LeanJet
- Consisting of drum or belt-belt compacting system
- Max. entangling steps: Belt 1, Drum 1, Drum 2, Belt 2
- Max. weight: 100 g/m<sup>2</sup>
- Max. speed of 150 m/min
- Working widths: 1.2 m, 1.8 m, 2.6 m, 3.6 m
- PET, PP, CV, cotton and blends
- Plain, perforated and structured products are possible



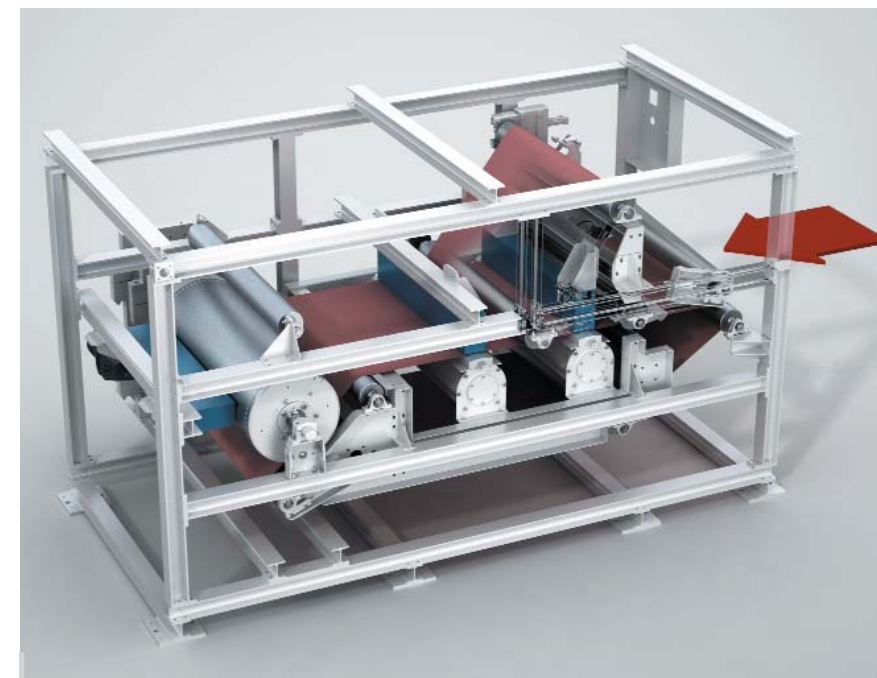
Lean

## FLEISSNER MiniJet

The newest member of the Fleissner water entanglement family is now standardized and commercially available.

It serves the need of institutes and other companies requiring research and development work, producers in niche markets, as well as "beginners" in the nonwovens world. The main features are:

- Working width of 500 and 1,000 mm
- Pressures up to 400 bar
- Speeds up to 55 m/min
- Max. entangling steps: Belt 1, Drum 1, Drum 2
- Ready-built for transportation, thus minimizing costs for erection and commissioning
- All synthetic and natural fibers can be accommodated
- Continuous process possible by adding the right selection of filter system for individual material specifications
- Commercially very attractive



Mini

# FLEISSNER SteamJet Technology

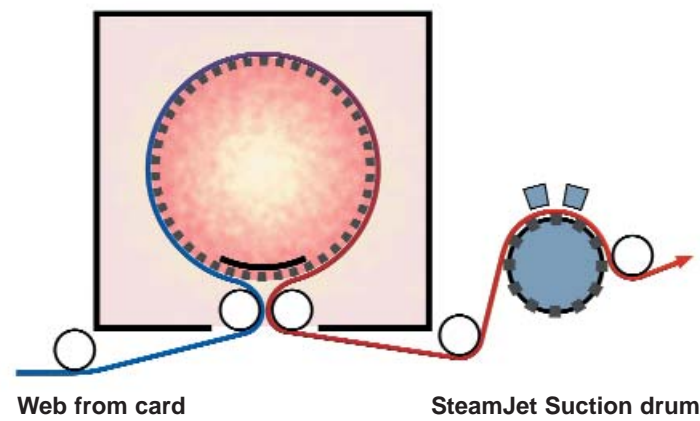
The Fleissner SteamJet was newly developed together with STFI Chemnitz. This machine bonds nonwovens by means of steam jets which are generated in steam heads with rows of holes similar to those in an AquaJet. The steam is overheated to prevent condensation in the product. Drying after the SteamJet is not required. SteamJet bonding offers the following advantages:

- Hydraulic and thermal bonding with simultaneous structuring or perforating
- Bonding from one or two sides on belts or drums
- Suitable for processing all kinds of synthetic fibers, filaments, blends with natural fibers.
- Web weights from 15 g/m<sup>2</sup> to more than 100 g/m<sup>2</sup> for multilayer products
- This process is particularly suitable for the production of nonwovens from fibers sensitive to water such as super-absorbent fibers and PVA
- Possible combination with thermobonding ovens for preliminary bonding and SteamJet for final bonding and structuring

New generations of products can be produced with this technology. For example:

### Thermobonded nonwovens additionally bonded and structured by a SteamJet

- Fleissner Thermobonder
- 2 SteamJets for bonding or structuring



The Fleissner SteamJet will complement the spunlaced products range by a new generation of completely new web qualities with special properties. This is the first new technology in the nonwovens industry after quite a long time which will strongly influence the market.

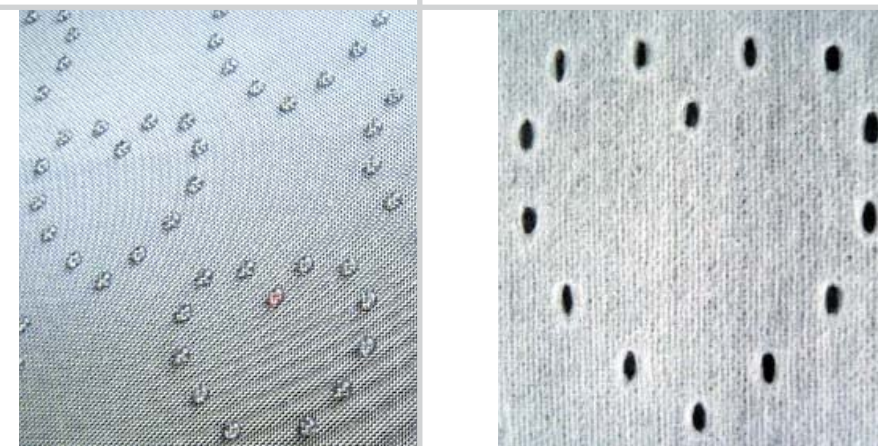
# Steam

## Perforation and Structuring

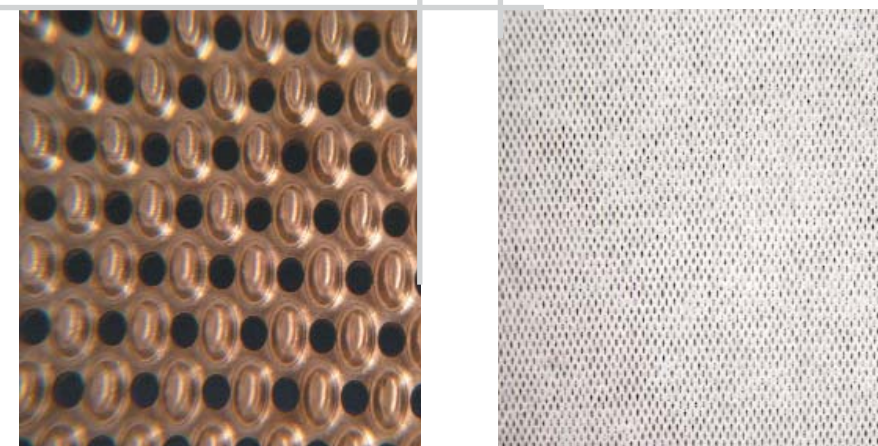
DOT technology for structuring



DOT technology for perforation



Nickel drum shell for perforation



**Nonwovens**  
**Textiles**  
**Man-Made Fibers**  
**Paper & Tissue**

Fleissner GmbH  
Beijing Lufthansa Centre  
Office Building  
50 Liangmaqiao Road  
Chaoyang District  
Beijing 100016 (PR China)

Fon: +86 (0) 10-646 510-40  
Fax: +86 (0) 10-646 510-42  
e-mail: fbj01@263.net

**AquaJet**  
**LeanJet**  
**MiniJet**  
**SteamJet**

Fleissner GmbH  
Wolfsgartenstr. 6 • D-63329 Egelsbach  
A company of Trützschler group  
Fon: +49 (0)6103-401-0 • Fax: +49 (0)6103-401-440  
e-mail: info@fleissner.de

Visit us at  
[www.fleissner.de](http://www.fleissner.de)

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