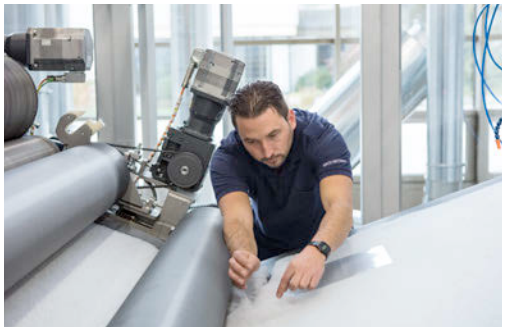
GROZ-BECKERT

Felting

Staple fiber needle punch line – from fiber to needle punched nonwoven

Groz-Beckert as your development partner

As a partner for development, and with its staple fiber needle punch line, Groz-Beckert has expanded its application consulting. This line is available in various utilization options to customers and partners for tests and joint projects in both needle and textile development. Customers moreover benefit from improved consulting and optimized products through Groz-Beckert's own in-house building of process knowledge. Emphasis is also placed on optimization of customer products and customer processes. The new line also provides customers with the option to produce small batch productions. Groz-Beckert's comprehensive concept helps to prevent resource bottlenecks and downtimes on customer lines.



Utilization concept

- Customer projects/trials/joint development
- Small batch production
- Own projects
- Groz-Beckert Academy, universities, etc.

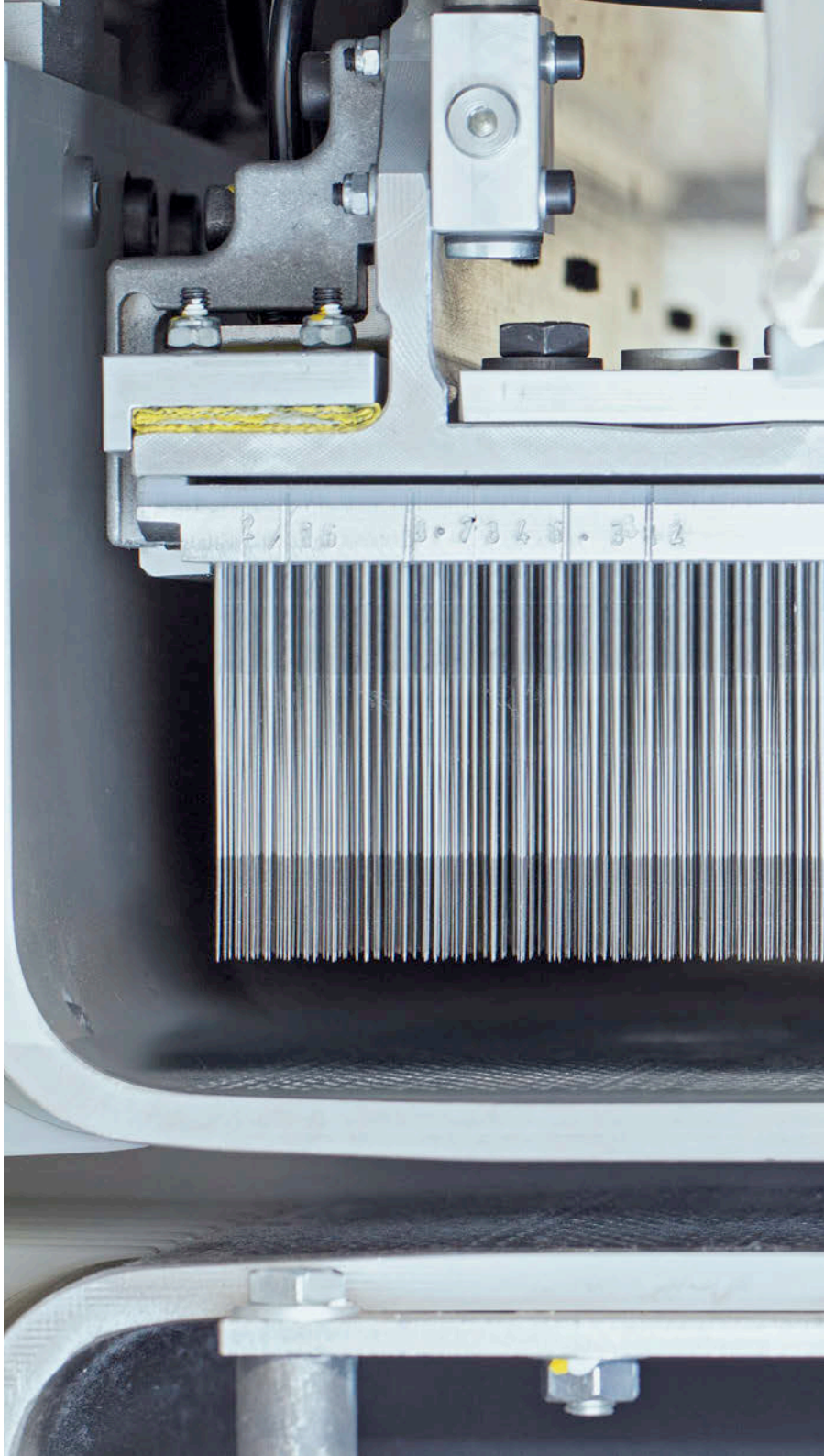
Contents

The Technology – from fiber to nonwoven

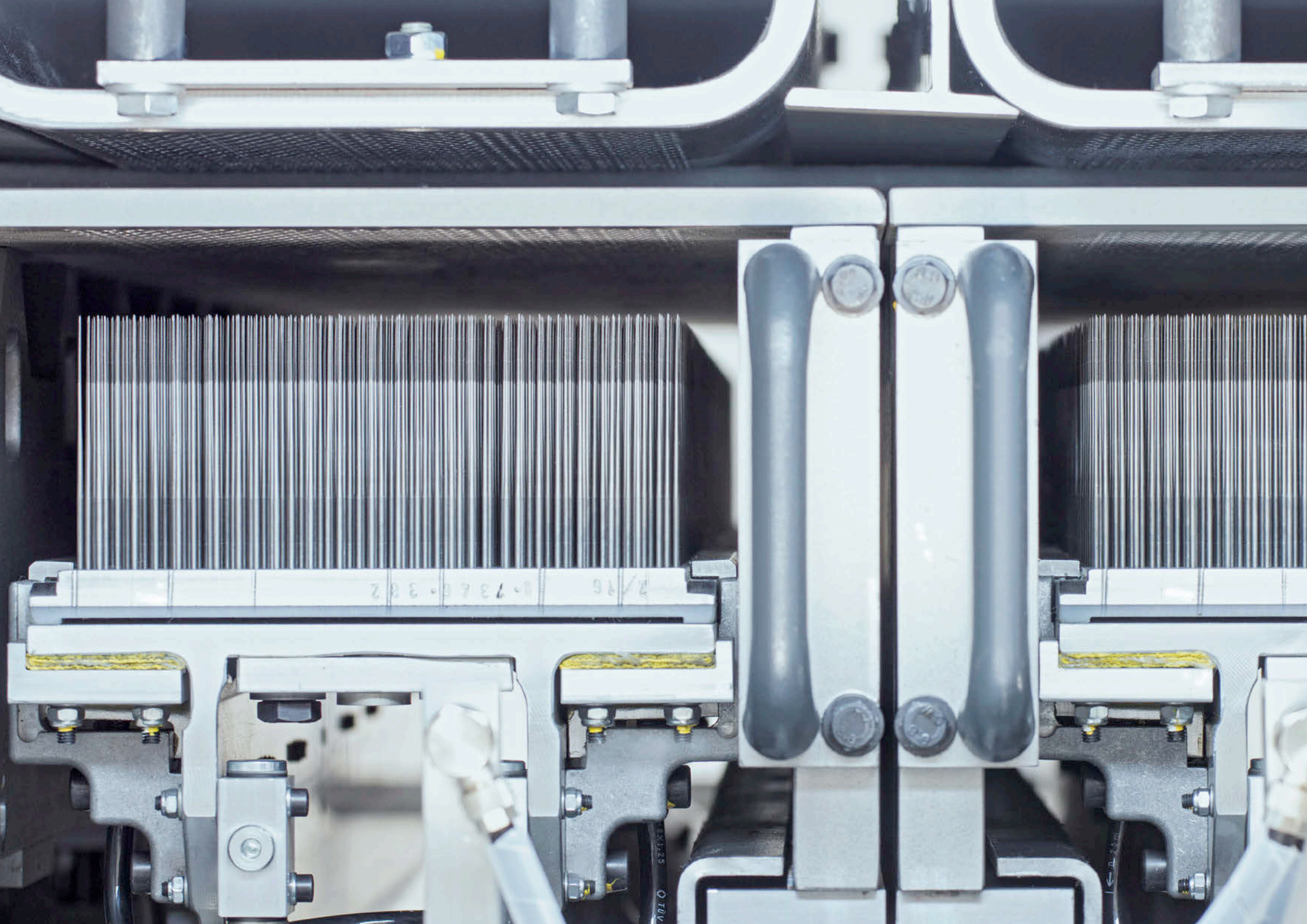
Nonwovens are textile fabrics made entirely or in large part from fibers. At the Groz-Beckert Technical Center Felting fibers are mechanically bonded by needle punching, which means continuous process from fiber to needle punched nonwoven.

Fibers enter the line in the form of bales. Bale openers gently open the firmly compressed fibers. In subsequent steps the fiber tufts are purposefully opened, blended, separated and then pre-opened. Using the components dosing opener, card feeder and suction conveyor belt, the fibers are uniformly fed in. Then the fiber flock mat, its weight and uniformity ensured by an electronic belt weigher, is fed into the take-in rollers of the nonwoven card. The card opens the fiber tufts to individual fibers and, using various roller combinations, merges them together into a uniform fiber web. This fine fiber web is layered in the downstream crosslapper to a defined width and number of layers until the necessary fabric weight has been reached.

Subsequently, the web can be stretched by a web drafter in order to adapt the fiber orientation and fabric weight to the requirements of the end product. A special compression and feeding system also optimally feeds bulky nonwovens into pre-needling. During needling the loose fibers are reoriented and entangled with the help of needles with barbs on their working parts. This increases the friction between the fibers and also the strength of the whole fabric. The nonwoven fabric is then wound up.



Needle punch unit of a Dilo DI-LOOM OD-II 20



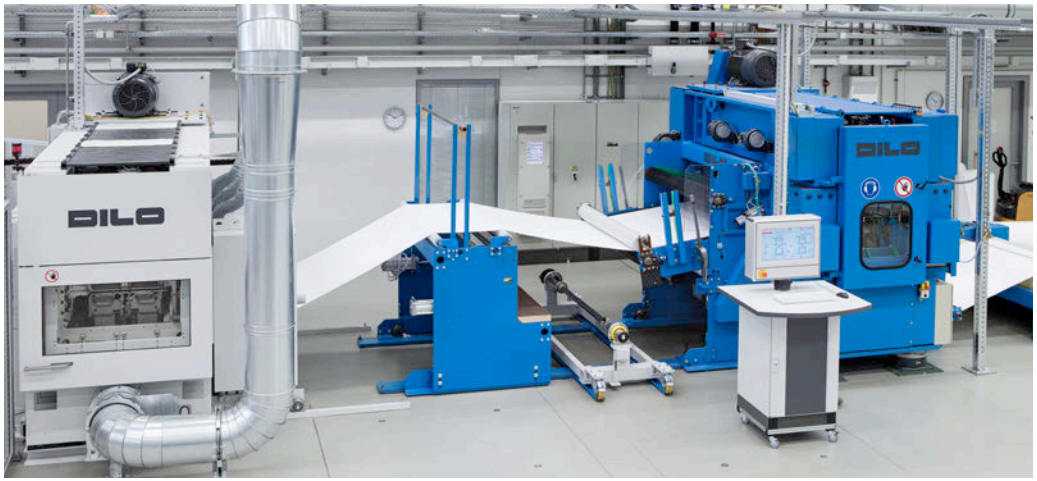
Total line configuration

The line can manufacture felts with fabric weights from 50 to 1,500 g/m² and a width of 1,500 mm at pilot plant scale. Synthetic fibers such as polypropylene (PP), polyester (PES) and polyamide (PA) can be processed, as well as regenerated fibers such as viscose (CV), and natural fibers such as high-tensile and inorganic fibers. The line is primarily laid out for applications with a fineness range of 0.9 to 17 dtex and a fiber length of maximum 90 mm. Coarse fibers can be processed within limitations, for example, the line reaches a throughput of up to 400 kg/hour for a polyester blend with 6.7 dtex

Fiber opening

Nonwoven card with crosslapper and web drafter

With a range of more than 1,200 active needle types, Groz-Beckert offers many opportunities for nonwoven manufacturers to further improve their products in such sectors as automotive, filtration, geotextiles and synthetic leather, as well as the development of completely new products. Optimization potentials tend toward surface enhancement and increased tensile strength (textile physical properties), reduction in fiber material consumption and general improvement of the production process. Furthermore, there is an option to climate control the technical center in accordance with customer requests in order to simulate specific production conditions. In addition to the use of the line, Groz-Beckert offers production-specific testing. Density, thickness and fabric weight, as well as air permeability, tensile strength and the web profile can be directly tested in the Competence Center Felting Technology. This helps to be able to and adapt production parameters during the trial if needed. Penetration force, for instance, can also be measured.



Needling

Measuring of penetration force

Textile and/or metallurgic tests can also be performed in-house. Short paths facilitate fast response times, interdisciplinary expertise and synergy effects within the Technology and Development Center (TEZ).

Specifications:

- End product: 50–1,500 g/m² automotive fabrics, filters, geotextiles
- Material: synthetic, regenerated and natural fibers, as well as high-tenacity and inorganic fibers
- Fiber fineness: 0.9–17 dtex
- Fiber length: 38–90 mm

Utilization options – flexibility from fiber to needled nonwoven

With the staple fiber needle punch line, Groz-Beckert offers its customers four utilization options:

Utilization option 1:
Use of the entire line

From fiber bales to main needling, all line components can be used.

Fiber opening and blending > fine opening > nonwoven card > crosslapper > web drafter > pre-needling > main needling > winding

Utilization option 2:
Utilization of the line beginning with the feeding point of the web drafter

For testing different tensile strengths, for example, in this option the pre-bonded web is fed beginning at the web drafter, before then reaching the needling zones.

Web drafter > pre-needling > main needling > winding

Utilization option 3:
Utilization of the line beginning with the feeding point of pre-needling

After feeding in a slightly pre-needled fabric, it can be pre- and main needled.

Pre-needling > main needling > winding

Utilization option 4:
Use of main needling

After feeding in a pre-bonded web, needling tests can be carried out.

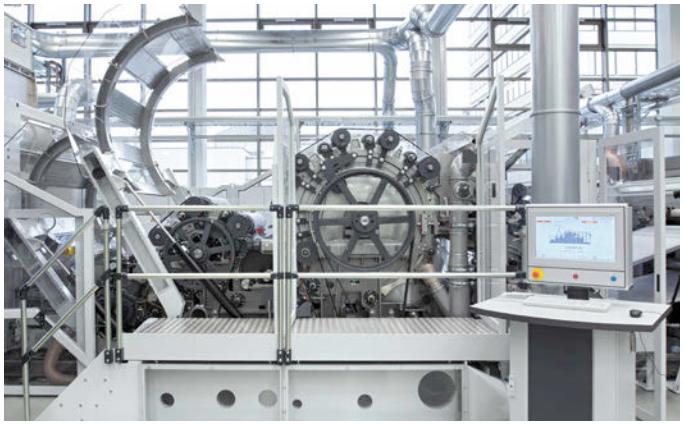
Main needling > winding

Technical line specifications

Fiber-opening and blending

Dilo Temafa

- 2x Baltromix
- Carding willow
- Resin applicator: capacity 500 l
- High-capacity blender
- Width 1,200 mm
- Feeding point for utilization option 1



Nonwoven card

Dilo Spinnbau

- MultiCard MC 3-5 CC
- Double doffing cylinder with condensing roller
- Working width 1,500 mm
- Fabric-weight regulating system

Crosslapper

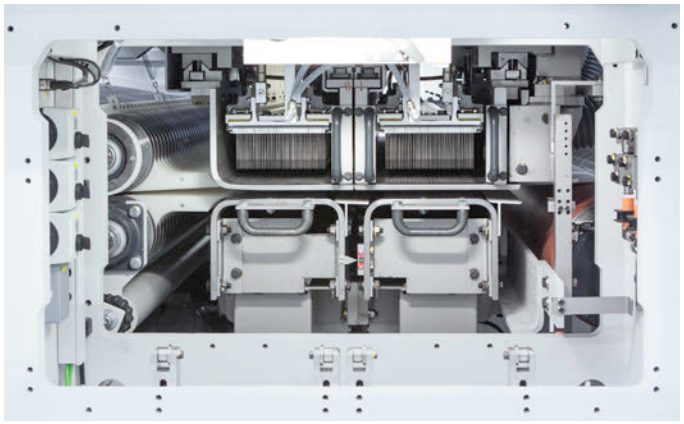
Dilo Machines

- DiloLayer, DLBS
- Max. laydown width 2,000 mm
- Max. input speed 80 m/min
- Max. web height 300 mm

Web drafter

Dilo Spinnbau

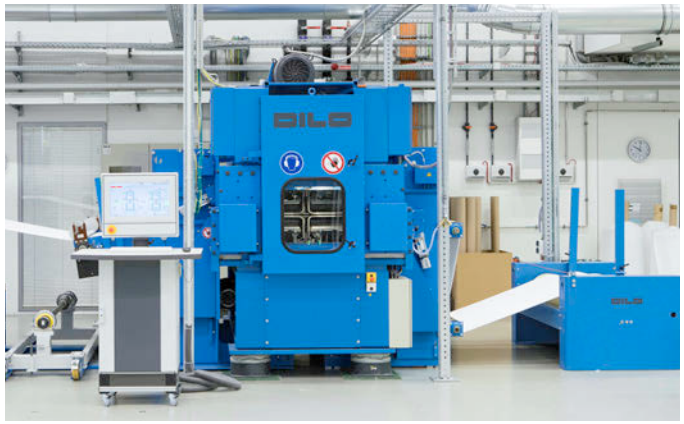
- Web drafter VST19
- Max. working width 2,000 mm
- Feeding point for utilization option 2



Pre-needling

Dilo Machines

- DI-LOOM OD-II 20
- 2x 4,500 needles/m
- Max. working width 2,000 mm
- Other needle densities available upon request
- Feeding point for utilization option 3



Main needling

Dilo Machines

- DI-LOOM OUG-II SB 15
- One-/two-board operation top:
  2,000 needles/m
- Single- and multi-board operation upstroke and downstroke,
  tandem operation:
  3,000 needles/m, 5,000 needles/m and 8,000 needles/m
- Max. working width 1,500 mm
- Feeding point for utilization option 4

Logistics

Groz-Beckert is present around the world for its customers and partners. Our production subsidiaries and sales offices, representatives and trading partners are perfectly complemented with a fully developed and worldwide logistics network. Groz-Beckert helps you reach your goals in your testing and development projects not only with professional and product knowledge, but also with logistics. Whether raw material or end product, Groz-Beckert supports you with all transportation routes so that your tests and projects are realized quickly and efficiently.

Technology and Development Center (TEZ)

On about 25,000 m² the TEZ combines scientific equipment and orientation with the economic standards of a successful industrial enterprise. The core goal of achieving concrete economic benefits from every project rests on a sound scientific basis. The paths to added value can vary.

A unique platform

Committed textile experts, real production machines and facilities, longstanding experience and comprehensive knowledge – excellence is merged at the TEZ. Competencies for different textile production and joining procedures are uniquely bundled and synergies generated.

In addition to the technical centers, the Groz-Beckert central laboratory has areas for material testing, a chemistry laboratory and a textile laboratory.

With no loss of time, the company can fall back on its wide-ranging products and far-reaching machine-building know-how. This facilitates testing and allows existing products to be adapted to new fields of application.

The TEZ in a few words

- Joint development of market-ready products and applications related to textiles
- New potentials and boosted efficiencies along the textile value chain
- The offer: knowledge transfer and training, services and testing, co-development and co-innovation
- Competence centers for textile production and joining procedures – short paths from ideas to series-production readiness
- Bundling of the competencies of the Groz-Beckert Group: analysis, needle and parts production, mechanical engineering competence

Groz-Beckert Academy and myGrozBeckert App

ANDROID APP ON Google play

Download on the App Store

Academy – Your textile training program

The Groz-Beckert Academy has made it its mission to pass on knowledge, to share experiences and to make know-how and expertise accessible.

The range of courses includes basic, continuing and specialized training, all of which are held in the Technology and Development Center (TEZ) in Albstadt. The Groz-Beckert Academy also offers individual training on-site at the customer.

All courses are offered in both German and English. Selected courses are also available in other languages, such as Chinese and Spanish.

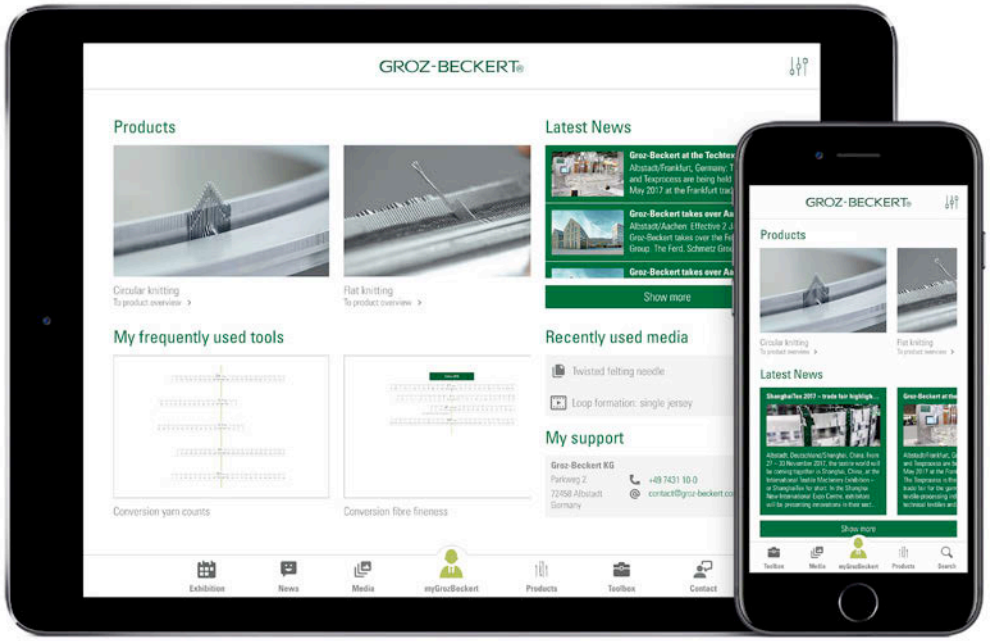
More information on the Groz-Beckert Academy is available on the website and in the training program

App – Your personal work tool

myGrozBeckert has brought the textile world together in one app since 2011. Providing information on Groz-Beckert products as well as the company itself. The highlight of the app is the Toolbox, which provides the user with useful conversion and calculation tools. The app also informs you of any news and events relating to Groz-Beckert.

The newest version of the app was released to app stores in 2017 with fully customizable navigation. This enables users to define favourites and preferred topics themselves and to change them at any time as required.

myGrozBeckert works with all iOS and Android smartphones and tablets, and is available in German, English, and Chinese. You can download the free app through the Google Play Store, the Apple App Store or through various Chinese app stores.



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