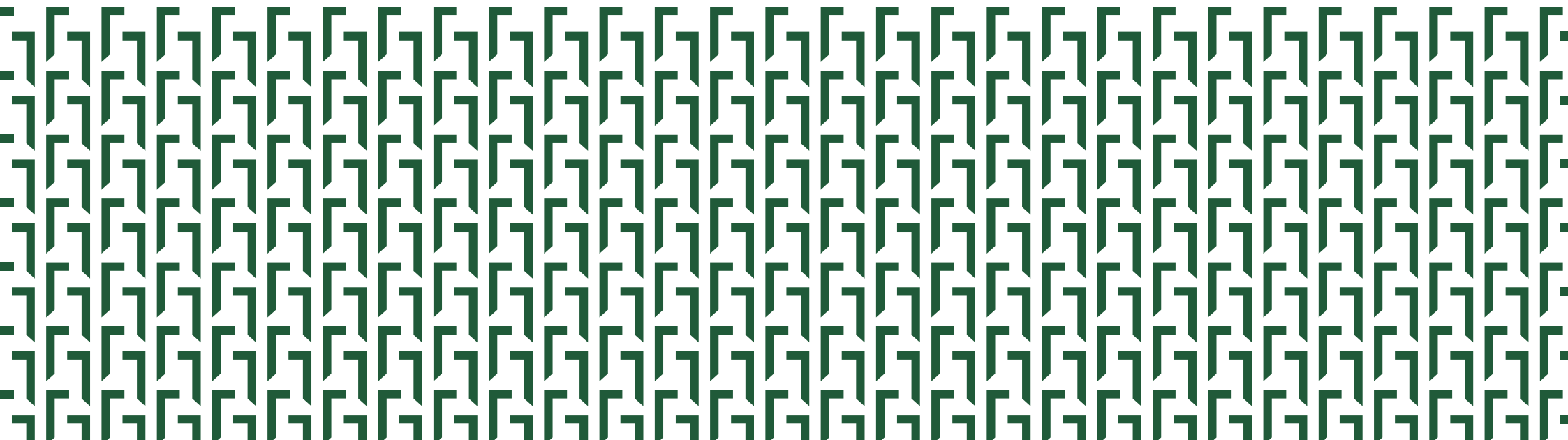


# Felting

Products and services for the nonwovens industry







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## Tradition and Future

Groz-Beckert was founded in 1852 and is active in over 150 countries today with more than 9,000 employees. Whether for knitting, weaving, felting, tufting, carding or sewing: Our total product portfolio contains over 70,000 products. As a leading supplier of industrial machine needles, precision parts, precision tools, systems and services for a wide range of textile production and joining methods, Groz-Beckert supports its customers and partners within the textile value chain – and beyond: The Technology and Development Center (TEZ) is a pioneering platform with which Groz-Beckert has been shaping the future of the textile industry together with machine manufacturers, end users, textile producers and institutes since July 2010.

### Groz-Beckert

Textiles are everywhere and are found in a wide variety of shapes and functions in all areas of life: Fashion, sports and leisure, home textiles, flooring or in architecture. And textiles are also indispensable for mobility – from cars to space travel – and for health.

Groz-Beckert manufactures machine needles, precision parts and precision tools and offers supporting services for all aspects of the textile industry, from fashion, home and domestic textiles to technical textiles.



### Technology and Development Center

Groz-Beckert represents reliable product quality and customer service in the world of textiles. The Technology and Development Center (TEZ) was opened in 2010 in order to develop new development and application fields for textiles in cooperation with customers and partners. Not only is the TEZ furnished with state-of-the-art equipment, it also provides the perfect environment for bundling the competencies and knowledge of Groz-Beckert. As a future-oriented company, Groz-Beckert places great value on the research and continued development of new technologies and application fields in the textile industry.

### About Groz-Beckert

- Founded: 1852
- Head office: Albstadt, Germany
- Employees: 9,282 (as of 31.12.2018)
- Sales: 745 million euros (2018)
- Production companies: Germany, Czech Republic, Portugal, USA, India, China, Vietnam, Belgium
- Distribution network: Distribution subsidiaries and partners in over 150 countries

## The Felting product sector

In 1980, Groz-Beckert extended its portfolio to include products for the nonwovens industry. Over time, the portfolio has come to include felting and structuring needles, jet strips, high-quality tools and accessories to create surfaces, as well as comprehensive services for felting products. Groz-Beckert provides to the nonwoven industry production solutions with any type of fiber material, be they wood chip fibers, animal fibers, natural fibers, mineral fibers, or synthetic fibers.



Felting and structuring needles



Jet strips



Staple fiber needle punch line

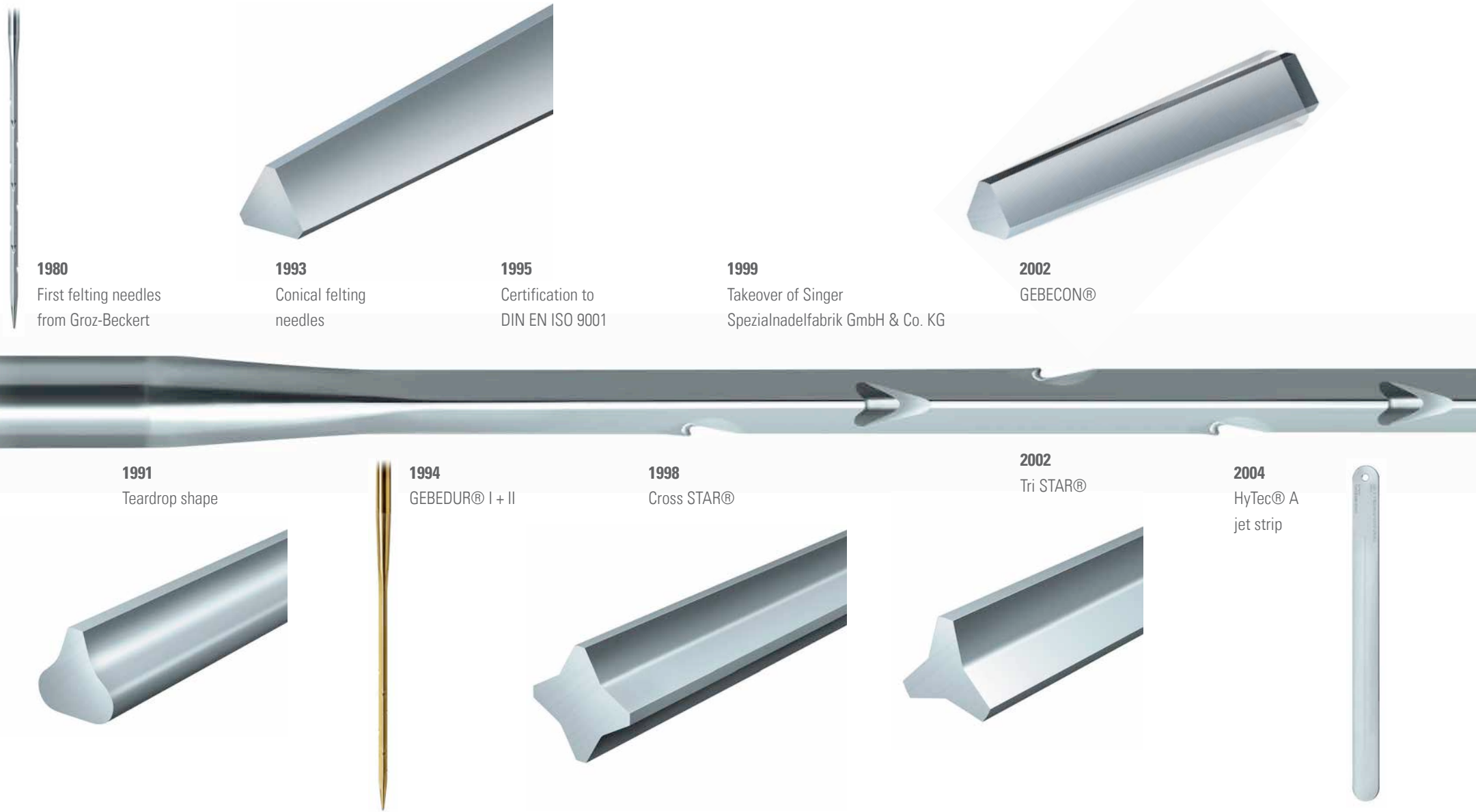
### Far more than just products

Groz-Beckert not only develops, produces and sells products for the nonwovens industry, it also provides a range of services for machine manufacturers and nonwoven fabric producers. The Technical Center Felting at the Groz-Beckert Technology and Development Center (TEZ) is equipped with a state-of-the-art staple fiber needle punch line, as well as various testing de-

vices for textile-related physical property evaluations under ideal analysis and testing conditions. The staple fiber needle punch line also provides the requisites to simulate production processes and develop process knowledge, in order to provide answers to varied questions. The central goal of the product division is to achieve process optimization around the manufacture

of nonwovens and the consistent expansion of overall expertise in the field of nonwoven bonding.

Continuous further development

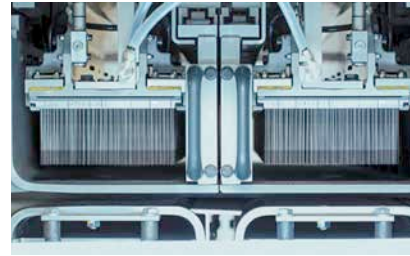




**2011**  
Board Master  
system



**2013**  
EcoStar®



**2017**  
Staple fiber needle punch line



**2010**  
Takeover of Foster  
Needle Co., Inc.



**2012**  
Patented needle  
packaging



**2014**  
Twisted



**2019**  
The Groz-Beckert  
customer product

- 1980** Market introduction of the first Groz-Beckert felting needles
- 1991** Market introduction of a teardrop shaped working part to manufacture papermaker felts
- 1993** Market introduction of felting needles with conical working parts
- 1994** Market introduction of GEBEDUR® I and GEBEDUR® II
- 1995** Certification of the Felting sector to DIN EN ISO 9001
- 1998** Market introduction of the Cross STAR® working part cross-section
- 1999** Takeover of Singer Spezialnadelfabrik
- 2002** Market introduction of the patented GEBECON® felting needle, the Tri STAR® working part cross-section, as well as chrome-coated needles
- 2004** Market introduction of the HyTec® A jet strip
- 2010** Takeover of Foster Needle Company, Inc.
- 2011** Market testing for board master systems (NeedleMaster and BoardScoot) and the HyTec® D jet strip
- 2012** Market introduction of a new, patented needle box for optimum needle protection
- 2013** Market introduction of the EcoStar® felting needle with a newly developed working part cross-section
- 2014** Market introduction of the Twisted felting needle with defined twisted working part cross-section
- 2017** Market introduction of the dur felting and structuring needles, the HyTec® P jet strip, and opening of the staple fiber needle punch line
- 2019** Market introduction of the Groz-Beckert customer product





Products



## The right tool for any application

With the mechanical nonwoven binding process, fibers are transported by felting needles or hydroentanglement, and incorporated into the nonwoven web. The nonwoven fabrics produced in this way, are used in a wide variety of fields including medicine, cars and aircraft, geotextiles, filtration, home furnishings, and felts for paper production machinery. Wide-ranging fields of application call for suitably specialized tools. This is why the Groz-Beckert portfolio of felting and structuring needles encompasses around 2,000 different needle types. Depending on the materials used, the requirements of the production processes and the end products, the most suitable needles need to have certain characteristics and “talents”. For jet strips, production is subject to customer request. The individual configuration and depth of variation provide a number of different options.



For more information, see  
the application brochure  
"Felting and structuring needles"

## The Groz-Beckert portfolio of felting and structuring needles

Depending on the fiber materials and required properties of the end product, different needle types are appropriate which differ in terms of their length, the shape of the working part and the distribution or properties of the barbs. Groz-Beckert offers many different high-performance felting and structuring needles.



Standard felting needle – view of the complete needle and working part

The portfolio encompasses:

- 2,000 needle types for all applications
- World market's most extensive production range
- Special needle geometries coordinated to wide-ranging product segments
- Needle designs to address the most stringent demands

## Felting needles – working part shapes

In order to allow the stringent demands imposed a wide range of applications, in terms of surface properties, tear resist-ance, uniformity, minimal damage to the fiber and substrate material as well as service life, felting needles with a variety of working part shapes are used.



Standard triangular



Tri STAR®



EcoStar®



Twisted



Cross STAR®



Conical



Teardrop

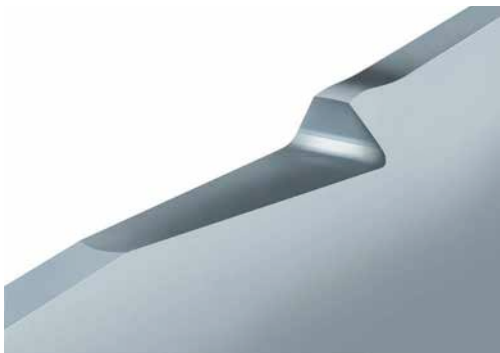


GEBECON®

## Felting needles – barb styles

In felting needles, the barbs are responsible for fiber transport. The dimension and shape of the barbs are highly significant in determining the efficiency of the needling process, as these are used to transport and entangle the nonwoven web. The size of the barbs is defined by the barb depth and kick-up, and significantly affects the fiber pickup. The undercut angle defines how well the fiber is retained by the barb. The formation of fiber loops brings about an increased degree of bonding in the fabric. As a result, higher fiber-to-fiber friction forces are created, which determine the final strength and volume as well as all other mechanical properties of the nonwoven fabric.

Groz-Beckert offers four different barb styles.



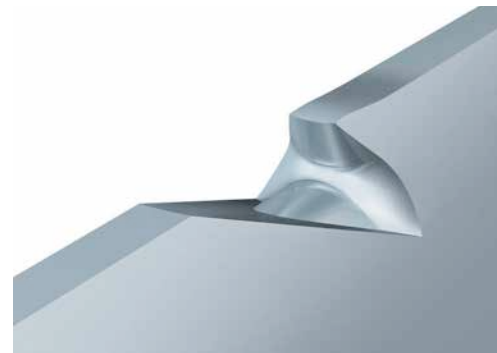
### KV-barb

- Clean, straight edges
- Efficient fiber transport



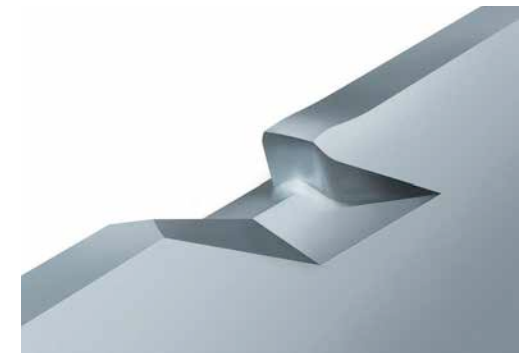
### HL-barb

- Three-dimensionally rounded shape
- Maximum care of the fibers
- Long needle service life



### RF-barb

- Accentuated base of the barb and rounded edges in the undercut area
- High degree of fiber transport coupled with gentle handling
- Significantly higher needle life



### FB-barb

- Three-dimensionally shaped contour
- Efficient fiber transport
- Even needling effect
- Long needle service life

## Structuring needles

**A distinction is drawn in structuring needles between fork and crown needles. The task of structuring needles is to structure already bonded nonwoven fabric in special machines. The surfaces are produced with a velvety or grainy character, or also feature geometric or linear patterns.**



Fork needle



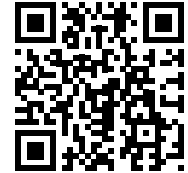
Crown needle

Fork needles have a shank with single or multiple reduction and cylindrical working part. The essential functional element is the fork opening on the working part.

Crown needles are structured in the same way as felting needles, with the only difference being the barb arrangement. There is precisely one barb located on each edge of the working part. The short distance from the tip to the barb is the same for all three barbs. This ensures an even loop formation.

## Jet strips

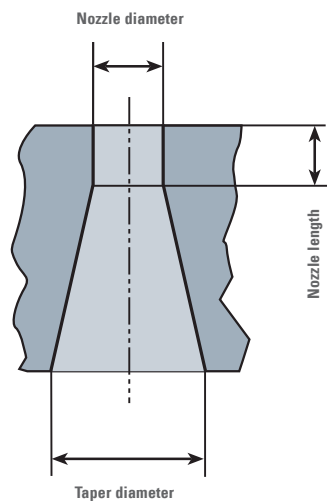
Jet strips are used for hydroentanglement, the so-called spunlace technique. As with felting and structuring needles, various jet strips are needed depending on the desired properties of the end product. Groz-Beckert offers jet strips in various dimensions and materials.



More information in the  
„Jet Strips“ application  
brochure



Jet strip



The portfolio includes jet strips with the following specifications:

- Overall length: 80 mm to 6,200 mm
- Number of nozzles: 40 to 20,000 nozzles
- Number of rows: 1 to 5 rows
- Nozzle diameter: 0.08 mm to 0.22 mm



## Fields of application for felting and structuring needles as well as jet strips

The areas in which felting and structuring needles, as well as jet strips are used, are almost limitless. Bonded nonwovens are also used in many technical areas due to their durability, appearance, functionality, low weight, and inexpensive production.



Door lining (Alcantara)



Parcel shelf



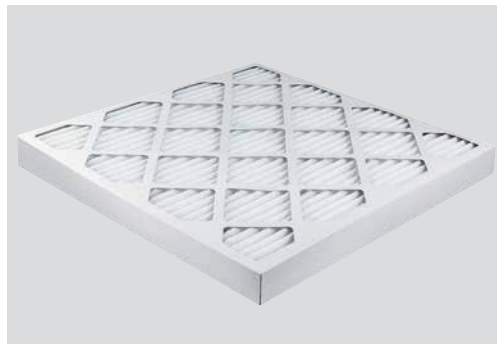
Hood absorber



Paper machine felts



Bitumen-coated roofing felt



Cassette filter



Wipes



Synthetic leather



Services

## Solving problems and making new discoveries

One of the fundamental requirements for producing nonwoven fabrics is to always choose precisely coordinated tools and accessories. To help its customers succeed, Groz-Beckert not only offers all the required products from a single reliable source, it also provides services for that added peace of mind.

## Felting and structuring needle-related services

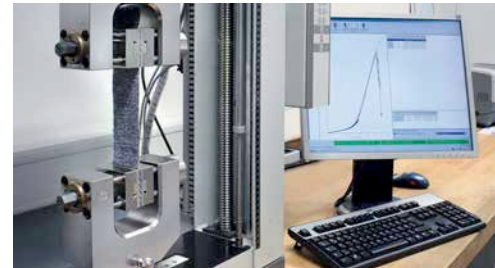
A universal staple fiber needle punch line, as well as various measurement and testing devices for textile-related physical examinations, are available for new designs and material testing at the Competence Center Felting Technology in the Groz-Beckert Technology and Development Center (TEZ).



The staple fiber needle punch line at the Competence Center Felting

The staple fiber needle punch line is suitable for performing fundamental testing of geotextiles, filtration media, automotive nonwovens, synthetic leather, home textiles or nonwoven webs for paper machines. Additionally, the facility is available for:

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



Testing tensile force and elongation

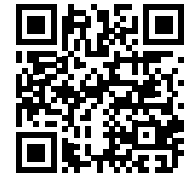


Determining penetration force

Measurement and testing devices for textile-related physical analysis play a significant role in assessing nonwoven fabric, and are the basis for comprehensive service. At Groz-Beckert, you can also call on leading specialists in applications engineering to help you find problem solutions or provide support in the development of your products.

In detail, Groz-Beckert can help with:

- Dynamic penetration force measurements
- Textile analyses (fibers/product)
- Needle analyses
- Fundamental analyses
- Product assessments (surface, strength, density, ...)



More information available  
in the brochure "Staple  
fiber needle punch line"

### Further analyses

The Felting product sector can also call upon a broad based fund of textile expertise and extensive laboratory facilities in the Technology and Development Center (TEZ). Alongside laboratories for material and chemical analyses, a textile test lab complete with the latest ultra-modern equipment and standardized climatic test facilities is also available. Here, tests can be performed in particular for nonwoven fabrics - from the raw material through fibers and yarns through to the finished end product.



## At home in the world of nonwovens

**Groz-Beckert is there for its customers the world over: The Groz-Beckert production and sales subsidiaries around the world are backed up by a close-meshed network of distributors and trade partners, ensuring that our customers can call directly on us in around 150 countries.**

### Product sector objectives

- Increased productivity, product quality and service life
- Sparing use of resources
- Process optimization



### The Groz-Beckert Felting product sector

- Product diversity and complete portfolio: The world's broadest-based and most extensive portfolio
- Worldwide service and sales network
- Warehousing in central customer regions
- The best delivery capability anywhere in the world by a long margin compared to other needle manufacturers
- Expert teams in the local sales regions
- Multiple-stage safety concept
- Expertise in mechanical bonding
- 160 years of experience in the manufacture of precision tools

# Groz-Beckert Felting worldwide

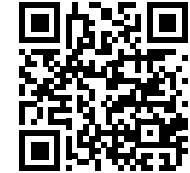
In addition to its headquarters in Albstadt, Germany, which houses production and distribution as well as development facilities, Groz-Beckert is there for its customers across the globe with its own production and distribution locations.





## Groz-Beckert Academy

**Apart from offering personal application advice, Groz-Beckert has always supported their customers by providing product as well as basic knowledge along the textile value chain. Since 2012 this part of the comprehensive service package has a name: The Groz-Beckert Academy has set itself the task of sharing and passing on knowledge, imparting experiences as well as making know-how and competencies accessible.**



Download the current  
training program

Whether it is knitting, weaving, felting, tufting, carding or sewing – the Groz-Beckert Academy offers a comprehensive training program that covers all the most important textile production and joining methods. Using a mix of theory and practice, our experienced trainers share expertise and know-how. As a result, the participants are optimally equipped for their tasks within the textile world.

The course range covers various basic, advanced and special training courses, which are held in the Technology and Development Center (TEZ) in Albstadt. Moreover, the Groz-Beckert Academy offers individual trainings on-site at the customer's location.

All courses are offered in German and English. Selected courses are also held in additional languages, such as Spanish and Chinese.



# App myGrozBeckert

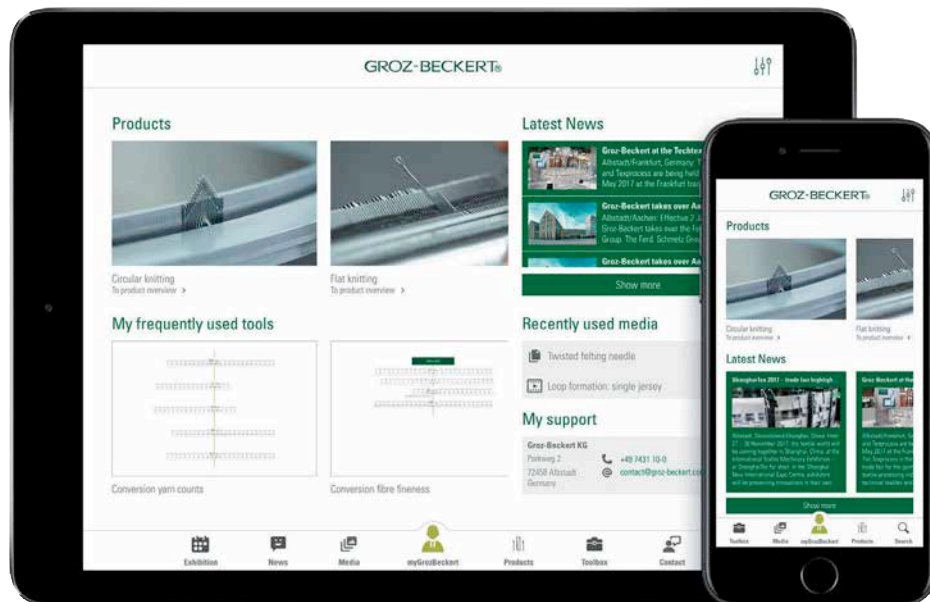
## Your personal work tool

As it is one of the most essential prerequisites of working effectively, Groz-Beckert traditionally places great importance on sharing knowledge and experience. In order to provide mobile access to this know-how and make it available offline, Groz-Beckert developed an app in 2011 that contains well-founded knowledge along the textile value chain and about the company.

Since then, myGrozBeckert has continuously been developed further, and as part of the 2017 relaunch a completely customizable navigation was implemented.

This allows users to save favorites and preferred topics themselves, and change them any time as needed. This is how myGrozBeckert becomes a personal and individually configured work tool.

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



### myGrozBeckert

Individual information on your personal dashboard



### Products

The extensive Groz-Beckert product and service portfolio



### Toolbox

Recommendations, tools and calculation aids



### Contact

The Groz-Beckert contact partners – worldwide



### Media

Animations, videos and brochures



### News

All news about the textile world of Groz-Beckert



### Exhibition

Data and facts on the Groz-Beckert trade fair presence



### Search

Key word search across all areas



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