

# Knitting

Products and services for the fields of hosiery and seamless bodysize

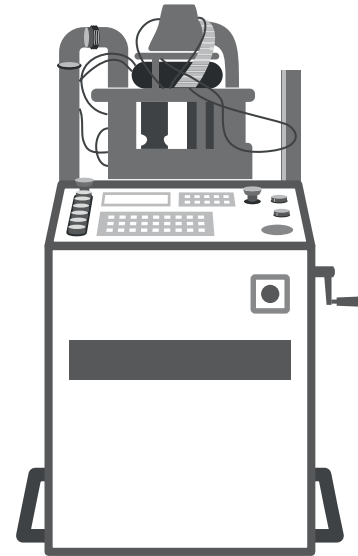


## Hosiery and seamless bodysize technologies

Groz-Beckert develops, produces and sells machine needles, precision parts, precision tools and systems for different textile production and joining methods. Its product portfolio serves the fields of knitting and warp knitting, weaving, felting, tufting, carding and sewing. Groz-Beckert offers more than 600 high-performance needles and system parts for the manufacture of hosiery and seamless bodysize textiles - for bodysize production it also supplies knitting cylinders.



Unlike large circular knitting machines, hosiery and seamless bodysize machines are used to produce individual articles to an advanced degree of product completion. Instead of being taken down as a continuous tube of fabric, here articles are individually ejected. Due to the wide patterning diversity, open cams are required for these machines. Here, needles with a defined bend are used. To produce the different fabric sizes, circular knitting machines with suitable diameters are used. Typical fields of application include the manufacture of hosiery, medical textiles, functional garments and underwear, bodies, swimwear, leisure and sports apparel.



### Seamless perfection

There is a growing tendency for fine knit goods such as underwear and sportswear to be produced without a seam. In contrast to large-diameter circular knitting, here the manufacture of finished items entails producing seamless and anatomically fitting or bodysize shapes. Where the garment appearance would otherwise be disrupted by seams, this knitting technology enables flowing transitions.



# Contents

The technologies	2
Products and services	4
Product portfolio	5
Product designations	6
Glossary	7
Topics taken from practice	8
High-speed production	9
Float stitch patterns	10
Maximum load capacity of the needle hook	11
Bending the needle	12
Plating	13
Transfer/lacy patterns	14
Stripe-free knit fabric	15
Protection against wear	16
Packaging, transport and storage	17
Groz-Beckert Academy and App myGrozBeckert	18

Over 160 years of experience and  
a worldwide company network

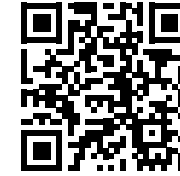
Groz-Beckert stands for outstanding customer service with individually tailored systems and solutions. Alongside knitting machine needles, system parts and knitting cylinders, the Groz-Beckert performance spectrum encompasses wide-ranging services.



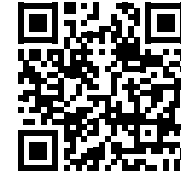
Products and services

## Product portfolio

The Groz-Beckert hosiery and seamless bodysize portfolio includes not only knitting machine needles but also system parts. There are also knitting cylinders available for seamless body size knitting.



More information on  
system parts



More information on  
knitting cylinders

### Knitting machine needles

Latch needles in widely varied versions for all different applications: From hosiery through medical articles to high-quality finished articles for underwear, sports and swimwear



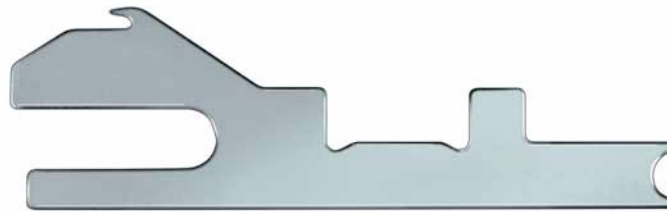
Latch needle Vo-LC™ 70.41 G 005 with deflection brake

### System parts

- Sinkers with and without partial hardness
- Selection parts
- Transfer parts
- Joint parts
- Intermediate jacks

### Knitting cylinders for seamless bodysize

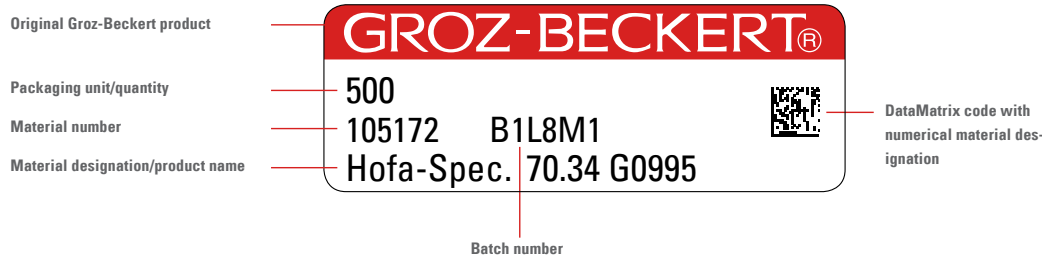
Single-jersey and double-jersey cylinders



Sinker SNK-OL 37.20 G 11 with partial hardening

# Product designations

## What information can I find on the product labels?



## What information does the product designation contain?

### Knitting machine needles

Hofa-Spec. 70.34 G 0995

- 1
- 2
- 3
- 4
- 5

- 1 Needle for hosiery machines
- 2 Total length in mm
- 3 Thickness in 1/100 mm
- 4 Groz-Beckert
- 5 Variant from Groz-Beckert

Vo-LC™ 70.41 G 005

- 1
- 2
- 3
- 4
- 5
- 6
- 7

- 1 Needle for seamless bodysize machines
- 2 Loop Control®
- 3 Total length in mm
- 4 Thickness in 1/100 mm
- 5 Groz-Beckert
- 6 G 00 hook
- 7 Variant from Groz-Beckert

### System parts

SNK-OL 37.20 G 11

- 1
- 2
- 3
- 4
- 5
- 6

- 1 Knock-over and holding-down sinker
- 2 OptiLoop®: Special protection against wear
- 3 Total length in mm
- 4 Thickness in 1/100 mm
- 5 Groz-Beckert
- 6 Variant from Groz-Beckert

### Knitting cylinders

ZPR-SATZ 15-28 G 3

- 1
- 2
- 3
- 4
- 5
- 6
- 7

- 1 Cylinder
- 2 Sinker ring
- 3 Dial
- 4 System with knitting capability = cylinder with sinker ring and dial
- 5 Diameter
- 6 Gauge
- 7 Variant from Groz-Beckert



## Glossary

---

### Knitting machine needles

Hofa-Spec.	Punched latch needles, special shape for hosiery machines
Vo-LC™	Punched latch needles with crimp
Vo-Spec.	Punched latch needles with transfer area

### System parts

SNK	Sinker (= knockover/holding down sinker)
AT	Selection part
KT	Joint part
UT	Transfer part
ZS	Intermediate jacks

### Knitting cylinders for seamless bodysize

Z	Cylinder
P	Sinker ring
R	Dial
ZP-SATZ, ZR-SATZ, ZPR-SATZ	System with knitting capability = cylinder with sinker ring and/or dial

### Special features

LC™	Loop Control®: Ultra-precision for fine gauges (used with needles)
OL	OPTILOOP®: Special protection against wear (used with system parts)
G00...	The G00 hook breaks if overloaded (preventing stripes in the fabric due to hooks which have been bent open)

## Topics taken from practice

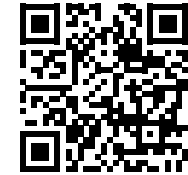


Every customer has individual needs and challenges. By providing experience, expertise and available capacity, Groz-Beckert can help its customers on the road to success as a supplier of systems and solutions. What are your aims?

- Do you want to squeeze the very most out of your production facilities?
- Do you want to produce flawless knit fabric to a premium standard of quality?
- Are you seeking new market fields and applications?
- Do you want your production to be sustainable and gentle on resources?

Talk to Groz-Beckert to discover ways of achieving your goals with greater efficiency.

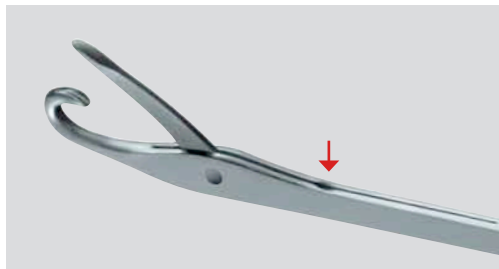




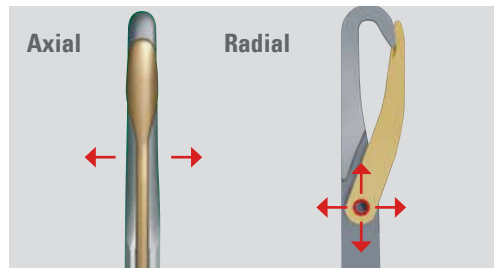
More information about  
latch guidance

## High-speed production with optimum latch guidance

With growing machine speeds, high performance is also demanded of the knitting elements. Impact speeds of the needle latch of up to 200 kph illustrate what sort of forces are at work here. To ensure that high-speed machine performance is not compromised by the knitting elements, these must be designed to withstand extreme loads and rotational speeds.



Precise-fitting latch seat for optimum latch guidance



Precise latch guidance and bearing

### Latch seat

To distribute the forces occurring on impact of the latch over as great a surface area as possible when in the open position, knitting machine needles are given a precise fitting latch seat. The impact is absorbed, which in turn enables high machine speeds and minimizes wear.

### Latch guidance and bearing

The precise guidance and bearing of the latch coupled with minimum initial latch play are other underlying requirements to ensure process reliability at even the highest machine speeds.

### Profitability/Productivity

Reduced needle consumption and improved process reliability – coupled with extreme machine speeds

### Quality

Uniform, flawless fabric quality

# Float stitch patterns

When knitting float stitch patterns, unselected yarns are laid as float stitches behind the formed loops. A reliable float function is indispensable for producing flawless fabric.

To support the float function, Groz-Beckert offers a range of needles with float hooks. With this special hook form, the crest of the outside arc of the hook is displaced towards the yarn feeder to ensure that the floated yarn is safely positioned behind the needle.

### Productivity/Quality

The even shape and execution quality of this hook form are key factors for ensuring a reliable knitting process and so guaranteeing flawless fabric quality.



Float look with latch spoon



Float hook with hook groove





More information on the conical hook

## Maximum load capacity of the needle hook

During the knitting process the hook, and in particular the base of the hook, are subjected to high levels of stress. Where additional stress is added due to knots, slubs, double or multiple yarns, the hook can bend or break if the elasticity limit is exceeded. Groz-Beckert developed the conical hook specifically to counteract these stress effects.

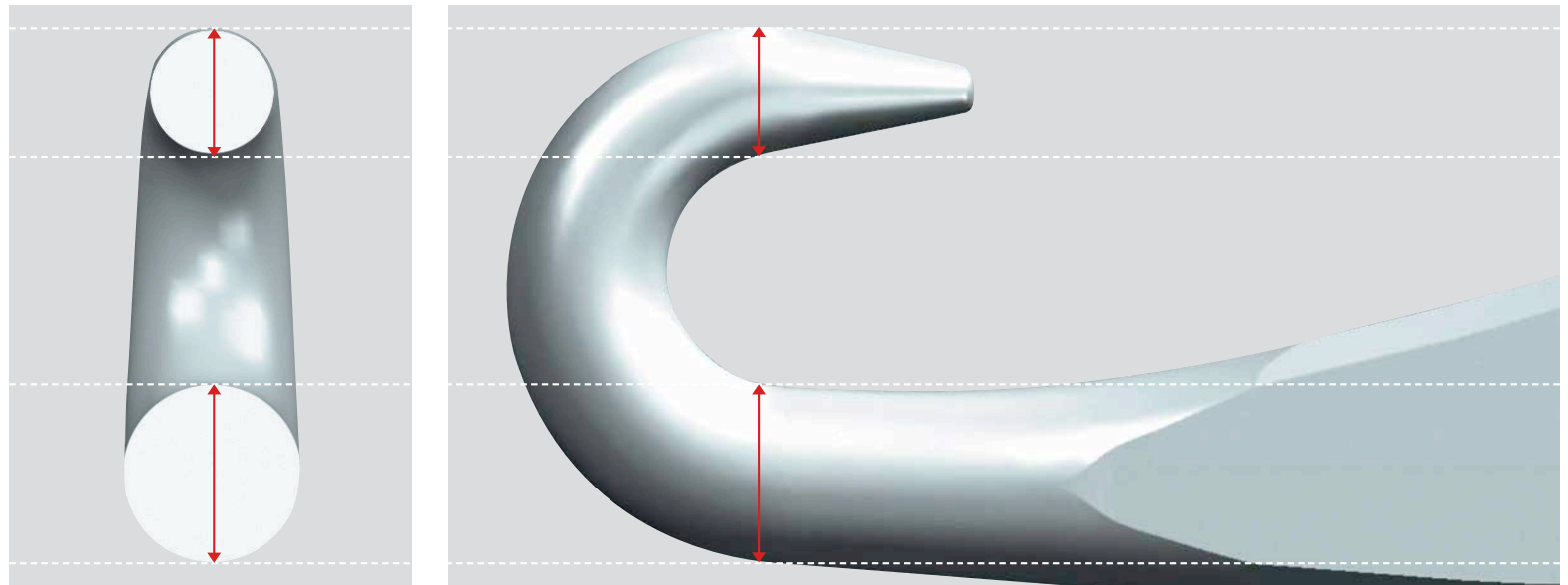
Thanks to the special geometry of the conical hook, greater yarn clearance is created between the loop forming elements. This allows both fancy yarns and also yarns with slubs and knots to be knitted without problems.

### Profitability/Productivity

Reduced needle consumption and improved process reliability due to hook stability, improved casting off behavior due to an enlarged hook interior and greater thread clearance

### Quality

Uniform, flawless fabric quality



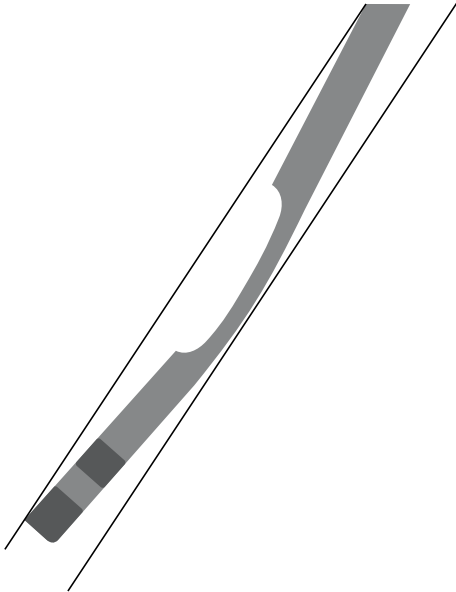
Conical hook form for more thread clearance and improved hook stability

# Bending the needle

Due to the wide-ranging patterning possibilities and knitting techniques offered by small circular knitting and seamless bodysize machines, for technical reasons these are equipped with open cams. In other words, the needle butts are not guided around the entire periphery in a closed track. To ensure that the needles are still reliably vertically positioned in the channel, these needles are produced with a defined lateral bend in the needle shank. This provides the necessary retention force in the channel.

To ensure correct positioning of the needle in the needle channel even at high speeds, with direction reversal or after long periods of machine standstill, and so prevent butt breakages, this bend must be correctly defined and precisely executed.

When developing a needle, the most suitable bend geometry is defined in each case. The precise execution of this bend is key to ensuring the reliable function of the knitting machine in the long term. This is why particular attention is paid to this characteristic at Groz-Beckert.



Bent needle in the needle channel

### Profitability/Productivity

Machine function ensured in the long term and improved process reliability due to fewer butt breakages

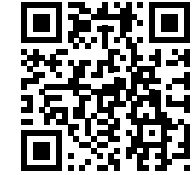
### Quality

Uniform loop structure

### Environment

Reduced energy consumption

# Plating



More information on needles with prim latch type

The elastane plating process can give rise to a range of different faults. These include holes caused by cuts into in the elastane yarn, twisted yarns or also structural faults due to unwanted float stitches caused by the elastane yarn not being laid in across one or more wales. These can be avoided by ensuring optimum machine settings in association with the use of high-grade knitting elements.

## Hook form

Alongside the classical plating hook, the Groz-Beckert range also includes a variety of other hook shapes depending on the machine. These ensure that the threads are laid in, held and cast off in the correct position during plating.

## Prim latch type needle

Even after a long running period, the special latch design ensures that wear-related cutting into the elastane yarn is avoided. This extends the service life of the needle set while reducing waste fabric.

## Needle surface

To prevent yarn twist and consequently plating errors, the surfaces of Groz-Beckert needles are treated to enable optimum stitch gliding, not only in the visible area but also in the inside arch of the hook which is so important to successful plating.

## Hook coverage

During plating, the feeders are frequently set in such a way that the latch movement supports yarn lay-in. To prevent the yarn from catching on the tip of the hook, precise coverage of the tip by the latch is vital. This is guaranteed by the precise-fitting groove design of Groz-Beckert needles.

With a range of special slot designs and latch geometries, Groz-Beckert offers additional innovations which specifically target the prevention of plating errors.

## Profitability/Productivity

Reduced needle consumption and improved process reliability – coupled with maximum productivity

## Quality

Uniform, flawless fabric quality



Round hook



Plating hook



Reverse plating hook



Prim latch type needle (latch without groove)

## Transfer/lacy patterns

Using transfer technology, high-grade lacy patterns can be produced on single-cylinder machines.

With the support of the transfer wing, a loop can be transferred from one needle to the adjacent one on the same needle carrier. This allows transfer in one direction within the same needle carrier. A needle with transfer wing has a transfer area between the loop forming area and the needle butt which is shaped like a wing. This wing forms a permanent part of the needle shank.

### Quality

Uniform, flawless fabric quality and wide-ranging patterning possibilities

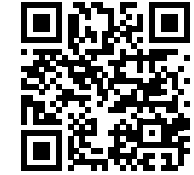


Transfer needle with transfer wing  
Vo-Spec. 100.50 G 01



Lacy patterns





More information on  
the G00 hook

## Stripe-free knitting with G00 technology

**Depending on the fabric, stripes caused by a hardly perceptible bend in a hook may only be noticeable after finishing - and possibly only after large quantities have been produced.**

Where there is unusually high stress on the hook caused by knots or slubs in the yarn, when knitting special constructions or sensitive fabrics, or at high machine speeds, Groz-Beckert offers the ideal solution with its G00 needle version.

What makes it special? The G00 hook does not allow any plastic deformation to take place, but breaks when overloaded. Any resulting flaw in the fabric is noticed immediately. The broken needle has to be replaced.

### **Profitability/Productivity**

Increased process reliability coupled with maximum productivity and reduced fabric waste

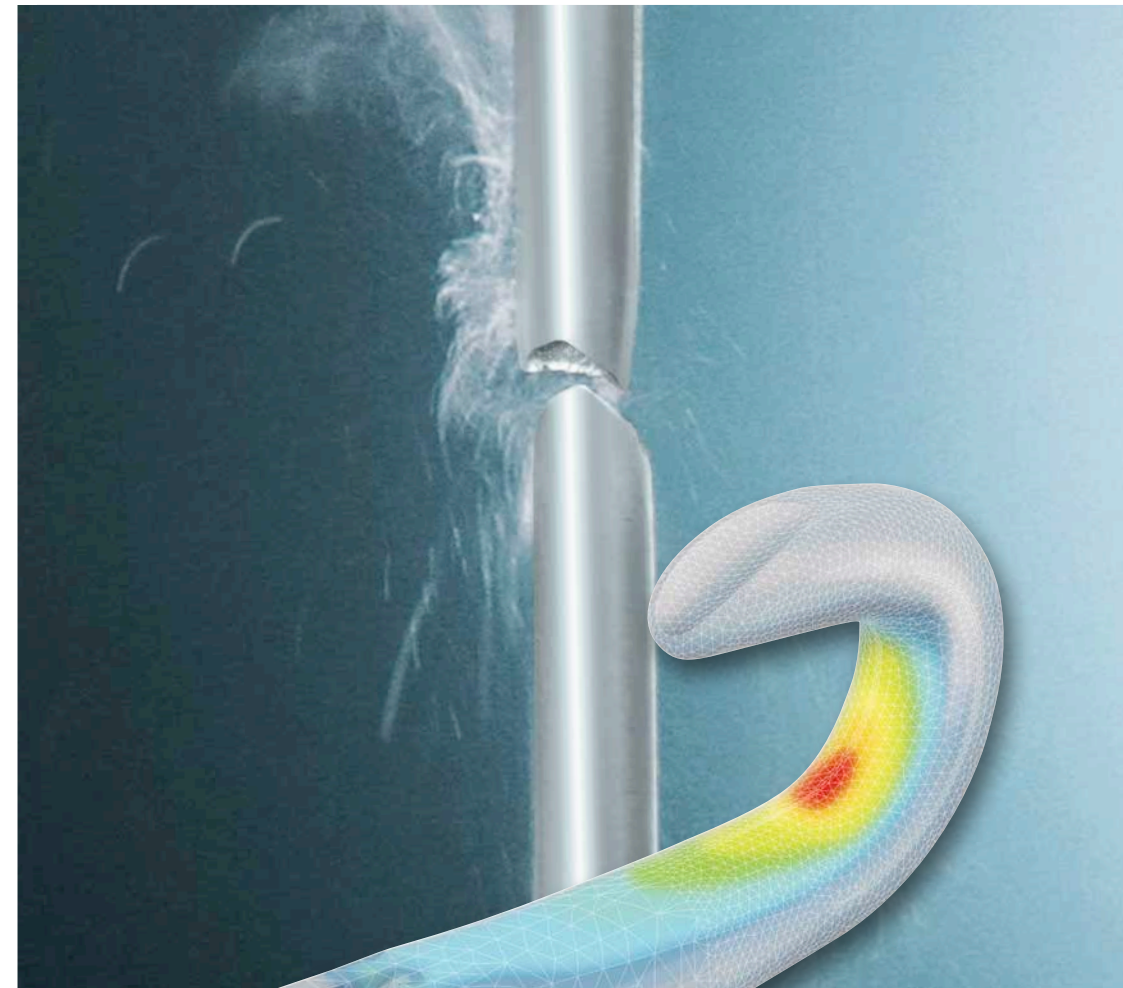
### **Quality**

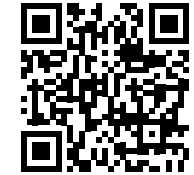
Prevention of stripes in the knit fabric: Possible faults are immediately noticed in the process chain

### **Environment**

Sustainable production thanks to reduced incidence of waste

**G00 technology: Hook breakage  
on overload**





More information on  
partially hardened sinkers

## Protection against wear due to partially hardened sinkers

Extreme stresses in the loop forming process due to mechanical influences will result in premature wear. The causal factor of particularly pronounced forms of wear are usually abrasive yarns. In the case of natural fiber yarns, these are usually contaminants which are harder than steel, and in chemical fiber yarns which are treated to induce matting, the culprits are titanium dioxide crystals which protrude from the yarn surface and literally saw into the steel.

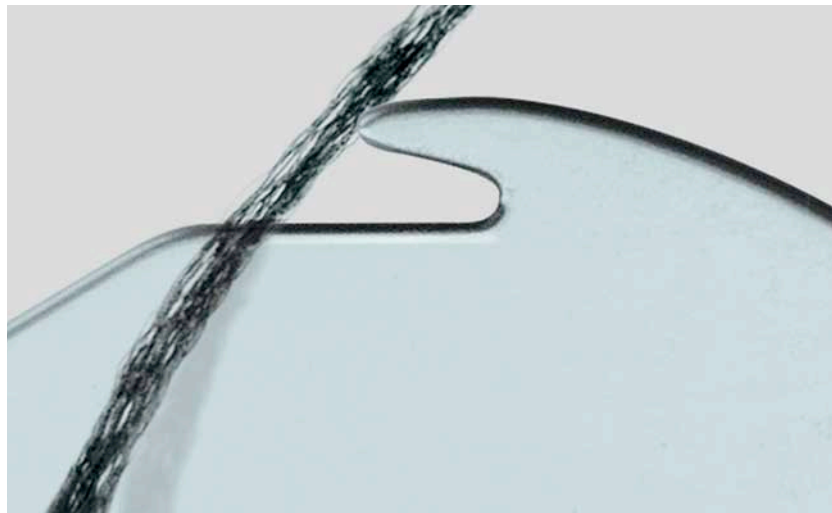
Groz-Beckert partially hardened sinkers provide precisely positioned protection against wear in areas coming into contact with the yarn. Their special feature is a precisely balanced ratio between basic and adapted hardness. These sinkers are particularly well suited for production at high speeds and when using abrasive yarns.

### Profitability/Productivity

Reduced sinker wear and improved process reliability  
– coupled with maximum productivity

### Quality

Consistent, flawless fabric quality due to extreme,  
precisely placed protection against wear



Optimum edge rounding and partially hardened material in areas coming into contact with the yarn

### Groz-Beckert product quality

The use of top-class raw materials, coupled with stringent ISO-certified processing standards provides a guarantee of a flawless surface finish and optimum geometry. These benefits make our products ideally suited to cope with extreme loads in the loop forming process. Durable knitting elements have a positive impact on cost-efficient production.

### Precision and dimensional stability

The optimum fitting accuracy, narrow production tolerances and precise workmanship of Groz-Beckert products leave no easy point of attack for wear, ensuring an even, uniform stitch appearance for longer than any competitor product.

## Packaging, transport and storage

Smart packaging solutions from Groz-Beckert provide you with active support in improving your cost efficiency. Less work effort directly reduces your set-up times. The effect: Reduced production costs compared to competitors.



Corrosion protection paper and protective film with corrosion protection oil



Packaging made of fracture-resistant material with adhesive tape



Compartmentalized container

### Packaging solution for needles and system parts

Climatic influences such as humidity and temperature fluctuations have a permanent impact on knitting machine parts and could compromise quality due to corrosion.

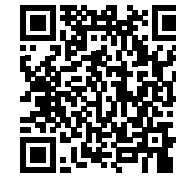
To counter this effect, Groz-Beckert developed systems for packaging its products which can comprise three components:

- Corrosion protection oil surrounds the product with an active corrosion protection.
- Corrosion protection paper reduces the influence of oxygen and water on the product.
- Plastic packaging prevents damage during transport and storage.

### Packaging solutions for hosiery needles

To protect the sensitive needles and simplify handling, the majority of these needles are packaged in special compartmentalized containers. This packaging solution simplifies needle fitting and replacing and prevents needle damage during transit and also on the customer's premises.

# Groz-Beckert Academy and myGrozBeckert App



## 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.

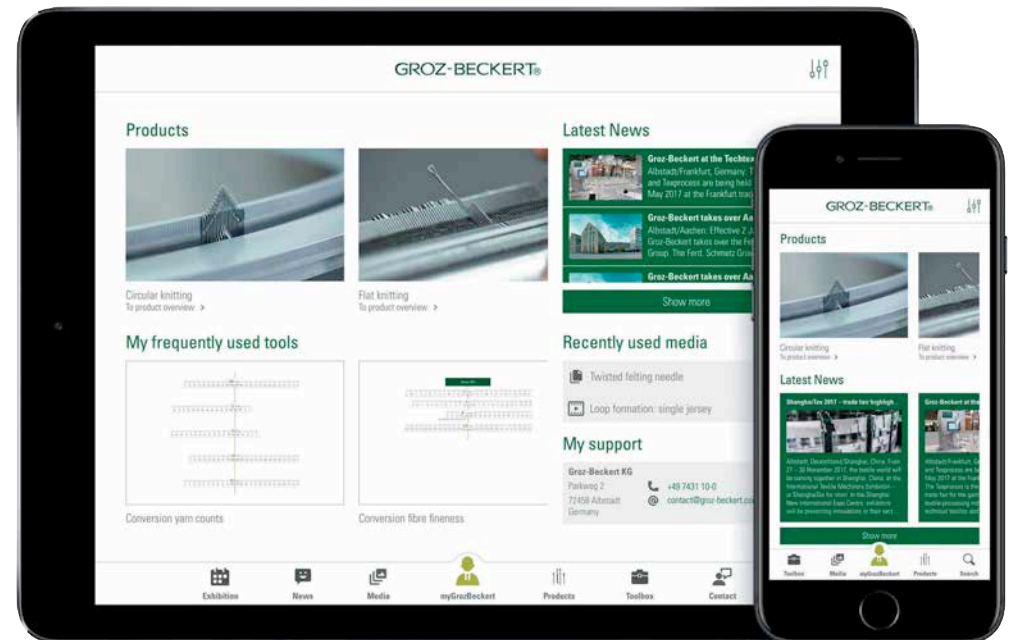
All courses are offered in both German and English. Selected courses are also available in other languages, such as Chinese and Spanish.

## 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.



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

**Groz-Beckert KG**

Parkweg 2

72458 Albstadt, Germany

Phone +49 7431 10-0

Fax +49 7431 10-2777

contact-knitting@groz-beckert.com

www.groz-beckert.com



The depictions provided of our products are not to scale and are intended for illustrative purposes only. Consequently they make no claim to be an accurate representation of the original.

® = Registered trademark of the Groz-Beckert company group.

© = This publication is copyrighted.

All rights reserved, in particular the right of duplication, distribution and translation. This publication or any parts thereof may not be reproduced or stored, processed, duplicated or distributed using electronic systems in any form or by any means whatsoever without the express written consent of Groz-Beckert.

# GROZ-BECKERT

KNITTING , WEAVING , FELTING , TUFTING , CARDING , SEWING

EN | 06.2019

