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GROZ-BECKERT®

## THE SAN® 5 GEBEDUR®



### NEEDLE DEFLECTION

Very often technical textiles are constructed from very hard materials. High penetration forces are the rule which often leads to a strong needle deflection.

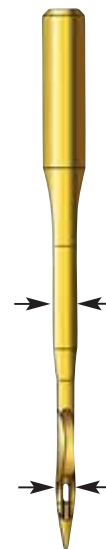
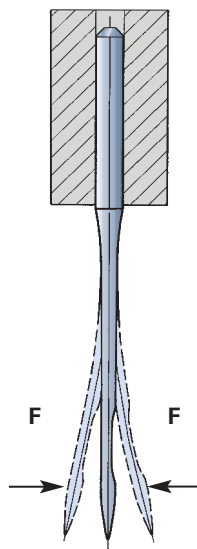
To avoid these problems, a new blade design was developed for the Groz-Beckert SAN® 5. The stipulation was high needle stability in combination with an optimum of penetration work.

#### Results can be:

- Skipped stitches
- Material damage
- Point damage
- Thread splicing and thread breaking
- Needle breakage



STANDARD



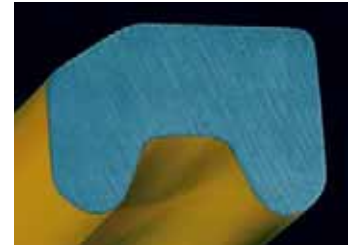
SAN® 5

## CROSS SECTION OF THE SCARF

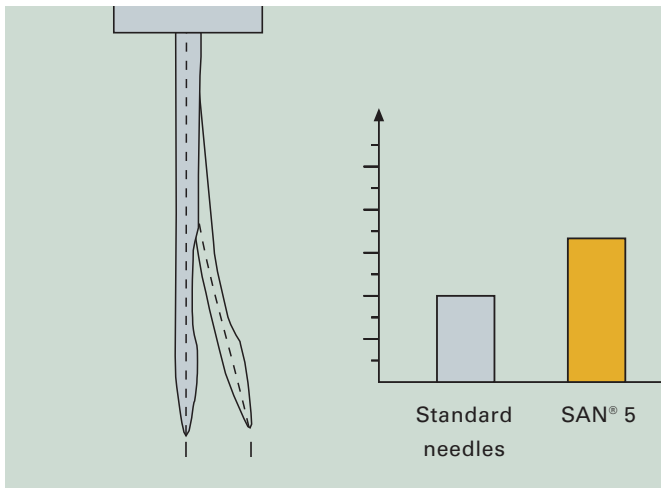
The higher stability of the SAN® 5 in the scarf area becomes visible in this cross section view of the scarf. The lateral scarf chamfer prevents damage to the hook point.



STANDARD



SAN® 5



## BENDING RESISTANCE

The special design of the entire working area of the Groz-Beckert SAN® 5 needle results in a clearly higher bending resistance in comparison to a standard needle.

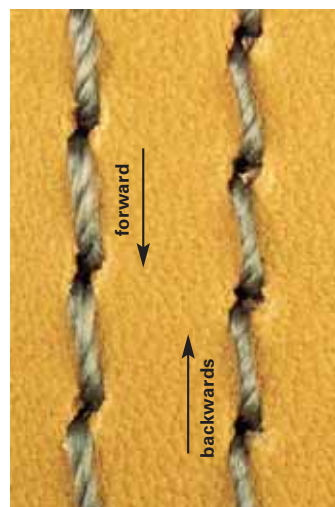
**A needle deviation of "X" with SAN® 5 needles requires approximately 25 % higher force than with standard needles.**

## THREAD TWIST SHIFTING

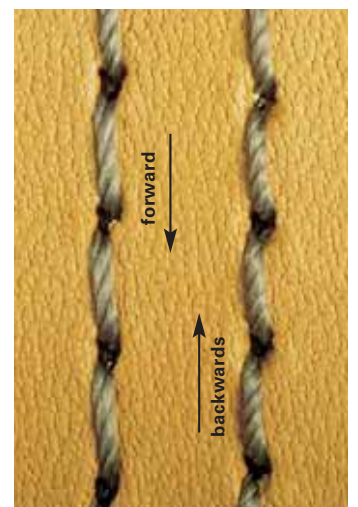
The SAN® 5 needle has a specially designed upper point groove. The edges of the eye lie deeper into the direction of the point. All thread-sliding areas are very well-rounded and polished. The needle thread slides protected over this specially shaped area.

### Result:

- The "twist shifting" in the thread is clearly reduced when compared to a standard needle.
- The Groz-Beckert SAN® 5 needle produces a visibly more constant seam appearance in comparison to a standard needle.

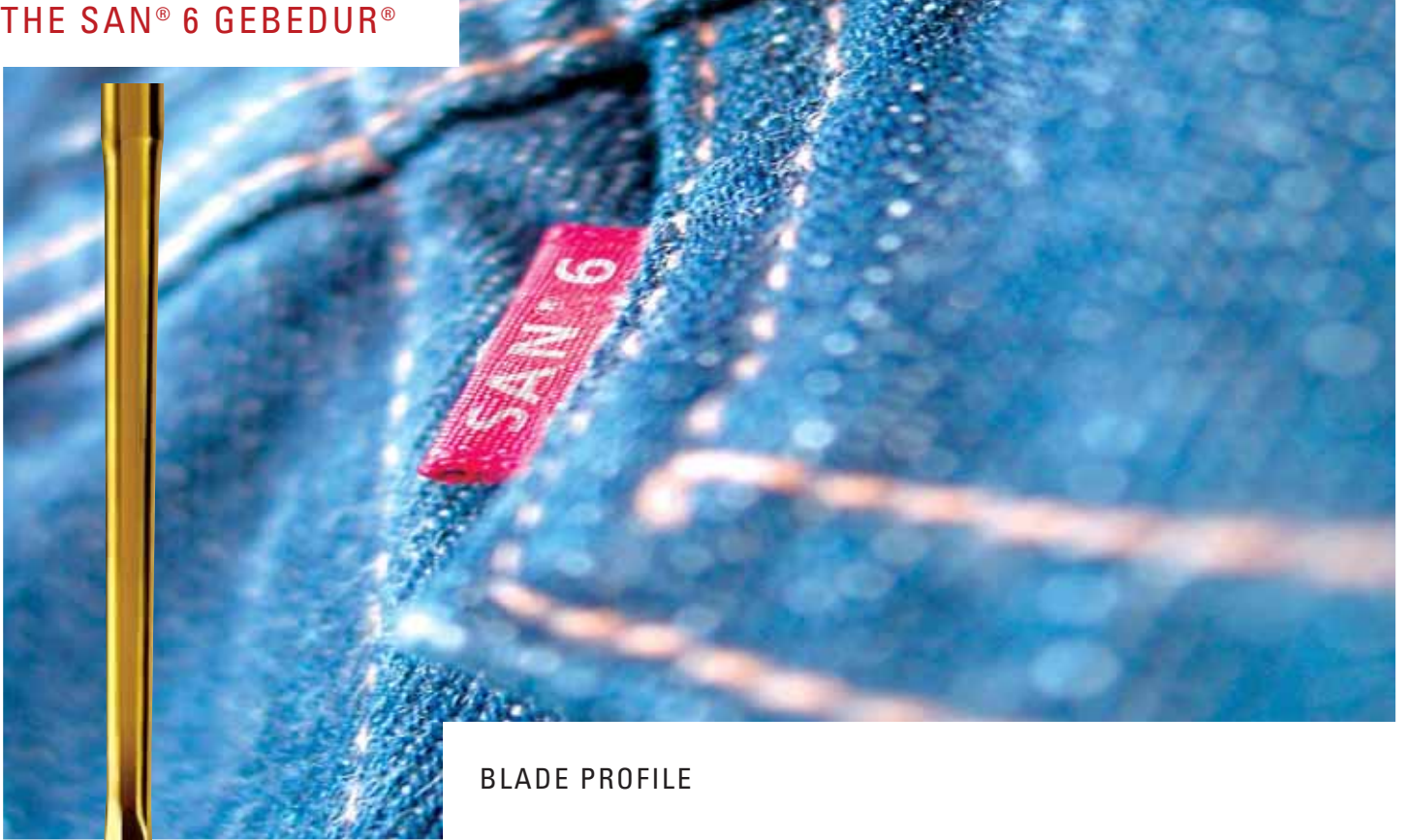


SEAM DIRECTION STANDARD



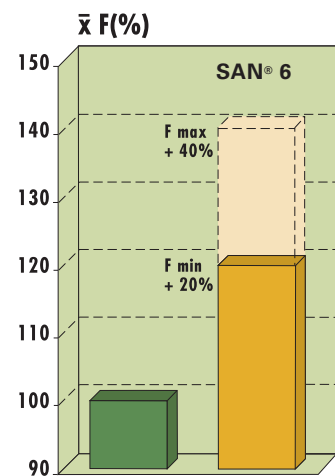
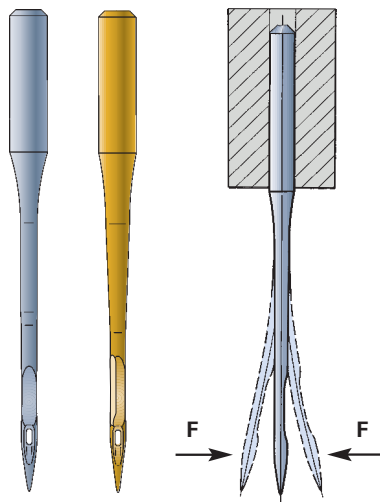
SEAM DIRECTION SAN® 5

## THE SAN® 6 GEBEDUR®



### BLADE PROFILE

The conical blade and the newly designed scarf cross-section give the Groz-Beckert SAN® 6 GEBEDUR® a higher bending resistance of 20 - 40 % in comparison to the standard needle.



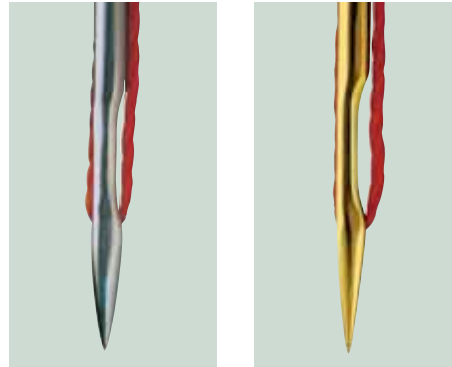
Scarf and blade profile prevent needle breakage, skip stitches and thread breakage. The looper point is protected.



## IMPROVED LOOP FORMATION

The guiding of the thread in the eye and scarf area causes a significant improvement of the thread protection and pick-up of the thread by the looper. Even with an extremely poor loop formation the looper has the possibility to pick up the needle thread.

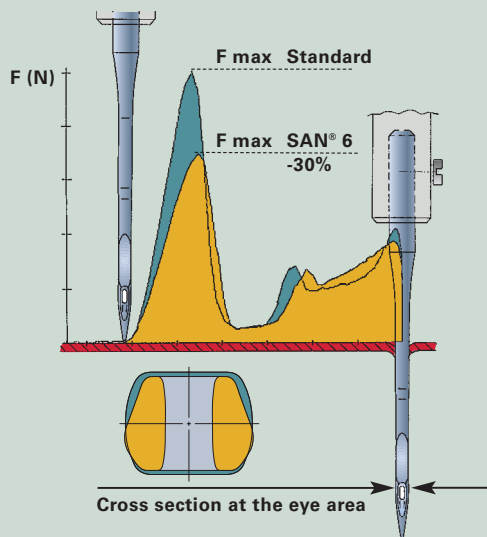
**Needle breakages and skip stitches are removed to a large extent.**



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SAN® 6

## FORCE DISTRIBUTION DURING PENETRATION



The consequent development of Groz-Beckert leads to the special blade shape and to a further improvement of the needle.

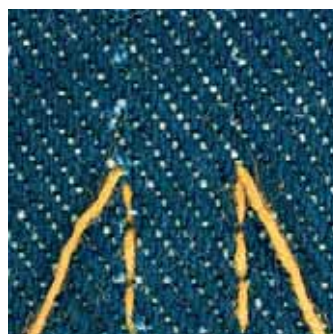
The reduction of the cross section at the eye area was a further step to reduce the penetration force.

**Depending on the needle system, the average penetration force lies up to 30 % below a standard needle.**

## GENTLE FABRIC PROCESSING WITH SAN® 6

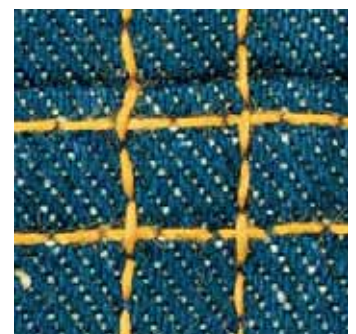
With the slim and rounded RG-point and the special blade shape the SAN® 6 stands for:

- High seam quality
- Less material damage
- Less skip stitches



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SAN® 6



STANDARD

SAN® 6

## THE SAN® 10



### CROSS-SECTION

During the sewing process the needle can reach extremely high speeds when moving through the fabric. The textile fibres or yarns have to give way to the needle within an extremely short time span of down to 0.0003 seconds. They are being displaced by the penetrating needle. The fibre displacement, a result of the bursting effect, increases overproportionally with the increase of the needle size. Consequently, there is a demand for the employment of the thinnest possible needles. However, such needles are rather instable or weak. They often lead to irregular staggered seams, to skipped stitches and to needle breakage. The machine speed has to be slowed down drastically.

In the design of the new Groz-Beckert SAN® 10 needles all those problems and requirements were taken into consideration. To realize this, specific manufacturing procedures had to be developed.

A SAN® 10 needle of size Nm 70/10 has the stability of a regular needle size Nm 75/11. Yet, the fibre displacement in the penetration area is comparable only with that of a regular needle size Nm 65/9. The SAN® 10 needles combine a most gentle fibre/fabric handling with increased sewing capacity.

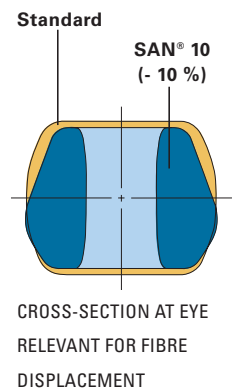
In the case of loop damage or needle cuts in knitted structures or excessive puckering in microfibre fabrics you should select a SAN® 10 needle of the same size as being used – or of **the next smaller size** without losing **needle stability**.



STANDARD

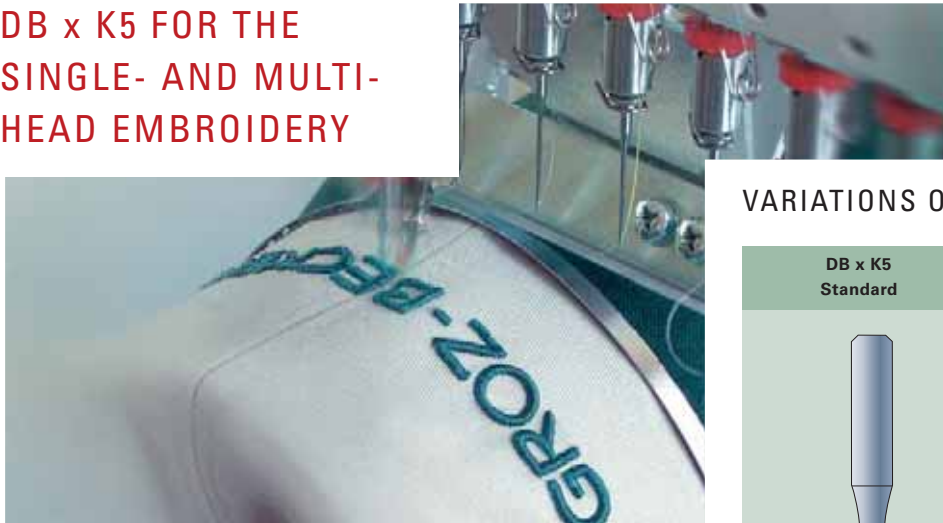


SAN® 10



In the case of stitch skipping, staggered seams or excessive needle breakage you should select a SAN® 10 needle of the same size as being used – or **the next bigger size** without an increase in **fabric damage**.

## DB x K5 FOR THE SINGLE- AND MULTI-HEAD EMBROIDERY



The needle system DB x K5 was especially developed for the use in modern high performance machines. During research and development the following points had to be considered:

- Reduction of skipped stitches
- Safe thread loop pick-up and thread breakage
- Maximum protection of thread and material
- Best universal point style
- Eliminate looping
- Optimum stitch fill (no gaps)

### THE FEATURES AND APPLICATIONS OF THE DB x K5

	DB x K5 Standard	DB x K5 SAN <sup>®</sup> 1 GEBEDUR <sup>®</sup>	DB x K5 KK
<b>Shank length</b>	Standard	Standard	short
<b>Point style</b>	RG (Standard)	RG (Standard)	RG (Standard)
<b>Coating</b>	Chrome	Titanium-Nitride	Chrome
<b>Application</b>	Standard needle for all common applications.	Needle with high stability and resistance against wear, universal applications	Needle for certain embroidery machines and deep penetration applications (for example three-dimensional embroidery)

Needle System	Bending resistance (N/°)
DB x K5	High
DB x K5 SAN <sup>®</sup> 1 GEBEDUR <sup>®</sup>	High
DB x K5 KK	Low

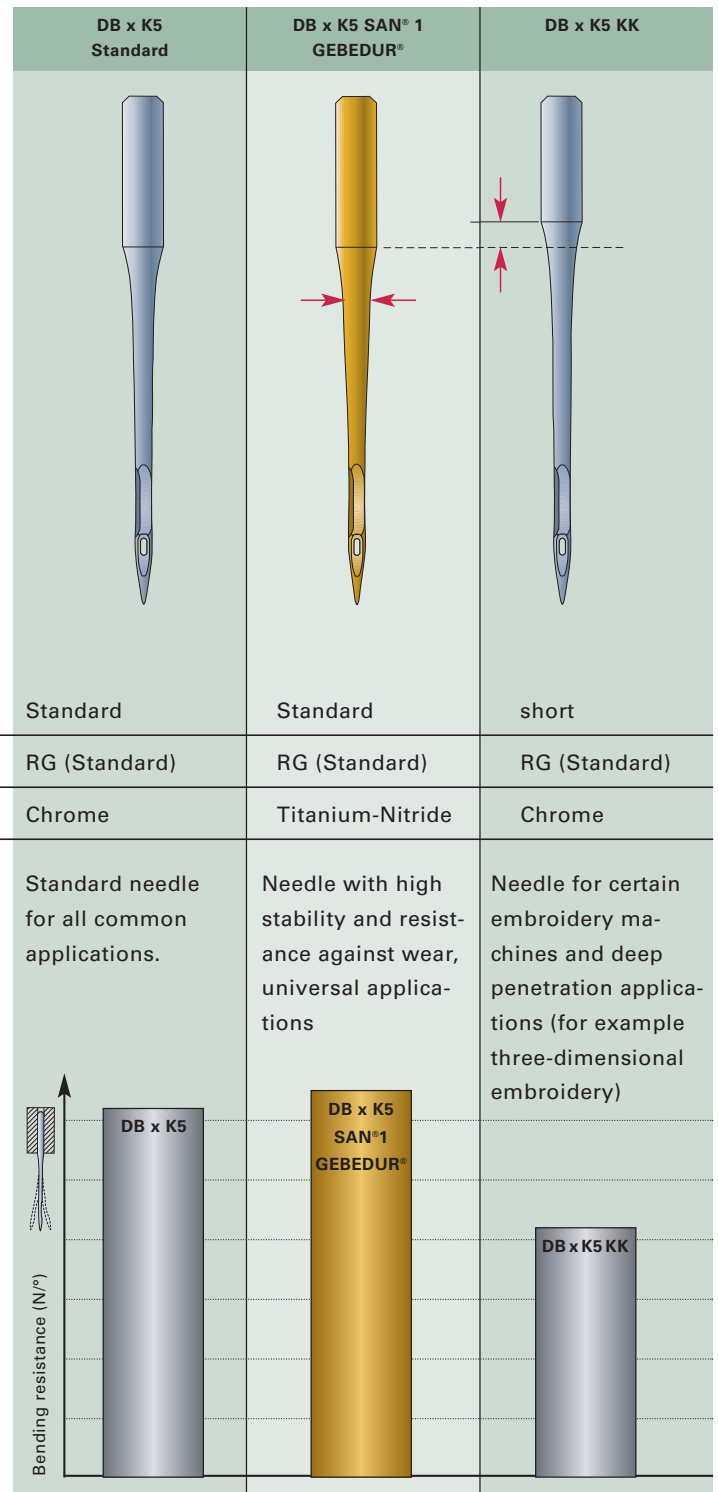
### STABILITY COMPARISON OF THE GROZ-BECKERT STANDARD DB X K5 AND ITS VARIATIONS

Essentially the needle system DB x K5 has the highest stability. The bending resistance of the standard needle is higher than any of the other needle systems used in the embroidery industry.

The Groz-Beckert SAN 1<sup>®</sup> GEBEDUR<sup>®</sup>, with its special design and a titanium nitride coating, offers highest stability and maximum resistance against wear.

The blade design of the "KK" version corresponds to the standard DB x K5 needle. However, due to its shorter shank, bending resistance is lower.

### VARIATIONS OF THE DB x K5



## THE SAN® 11 GEBEDUR®



### STABILITY

The Groz-Beckert SAN® 11 needle with its special blade and scarf geometry has an extreme bending resistance, ensuring the highest possible stability in the whole working part.

The very deep formed scarf makes an extremely tight adjustment of the looper to the needle possible.

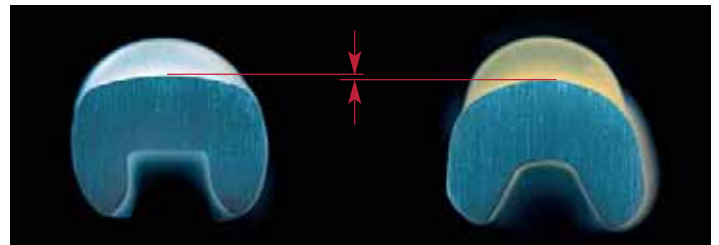
#### The advantages are:

- Less needle deflection
- Less needle breakage
- Less skip stitches
- Less thread breakage

BLADE CROSS SECTION



SCARF CROSS SECTION



STANDARD

SAN® 11



## CROSS SECTION AT EYE

When stitching through the material the maximum penetration force is reached in this needle area and increases over-proportionally with needle size. The special design of the Groz-Beckert SAN® 11 needle in this area results in significantly lower penetration forces in comparison with a standard needle.



STANDARD



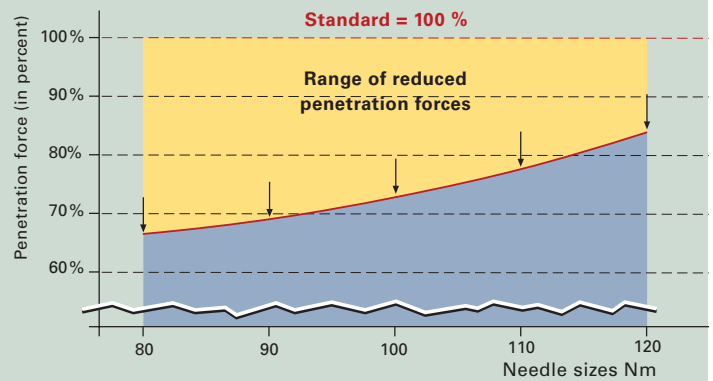
SAN® 11

## PENETRATION FORCE

The lower the penetration force the higher the fabric protection. The determined measurements of the penetration forces show significant advantages of the Groz-Beckert SAN® 11. In comparison with the standard needle they are 33% lower in size Nm 80 and 17% in size Nm 120.

### The results:

- Better fabric protection
- Less material damage
- Less seam puckering



## SEAM QUALITY

Especially in critical applications (material, thread etc.) the advantages of the SAN® 11 needle become visible with highest seam quality.

### The results:

- Special fabric protection
- Less material damage
- Less thread breakage
- Less skip stitches
- Less seam puckering

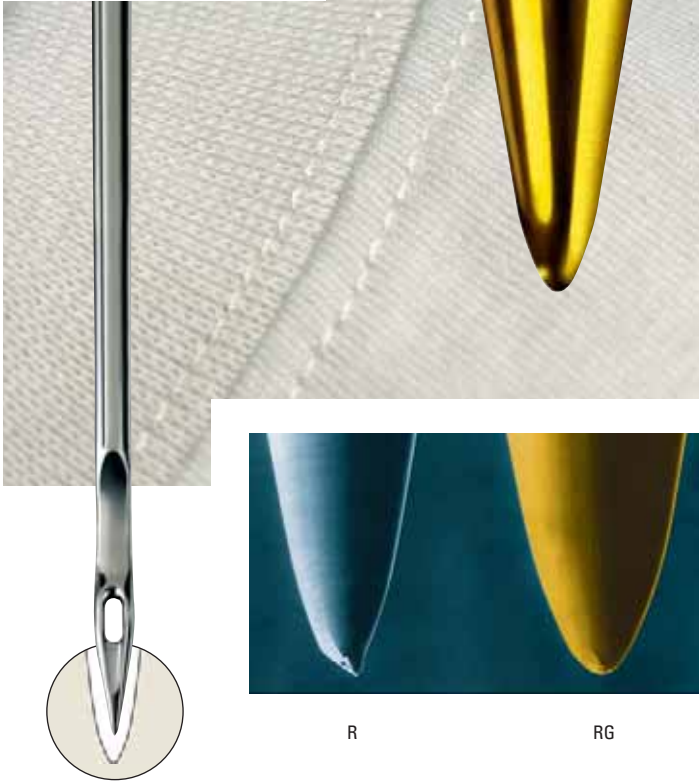


IMPERFECT SEAM



SAN® 11

## THE USE OF THE RG-POINT

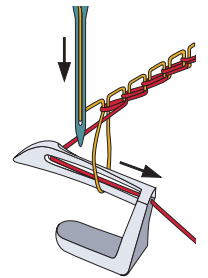


## USE IN CHAIN STITCH MACHINES:

The sensitive, sharp R-point is already damaged by contact with the hardened looper back after a short sewing time. With the light ball point of the RG, especially adapted to the looper back, this needle remains undamaged for a longer amount of working time.

### Advantages:

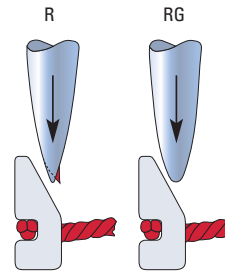
- Less material damage, reduced penetration force
- Less needle deflection (skip stitches, needle breakage)
- Higher process security, with less machine downtime



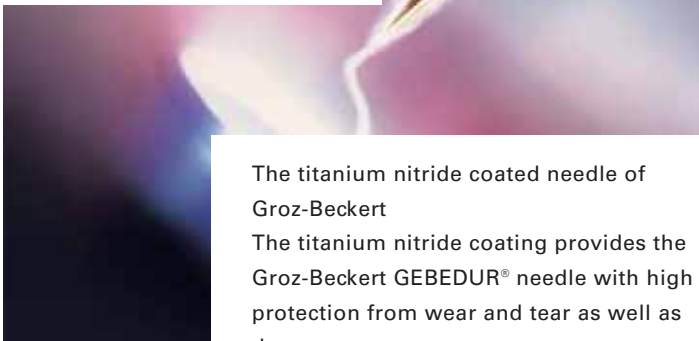
## OPTIMISED NEEDLE POINT

After a two-hour sewing test, under the same conditions, the following was revealed in multiple magnification:

The R-point shows a compressive strain on one side of the tip and sharp edges. The RG-point of Groz-Beckert shows nearly invisible friction marks and is still able to operate without limitation.



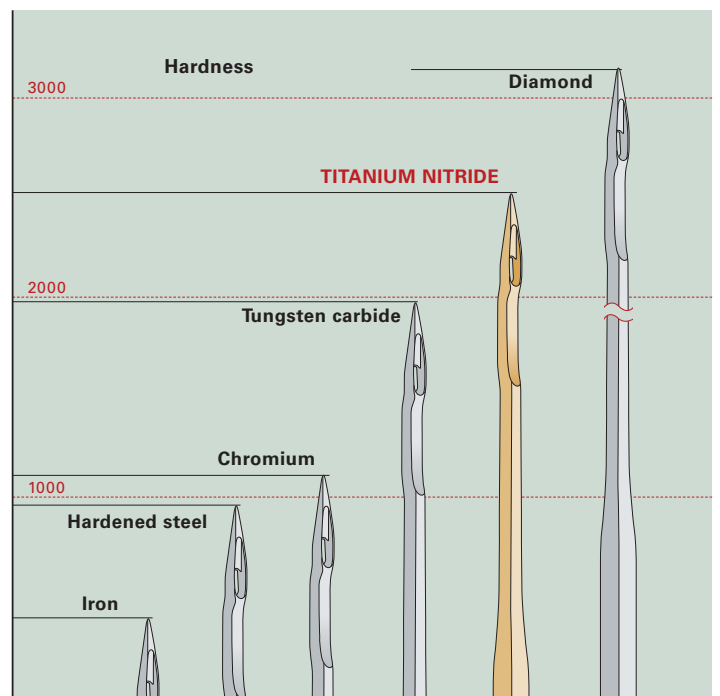
## COMPARISON OF THE GEBEDUR®-COATING IN HARDNESS



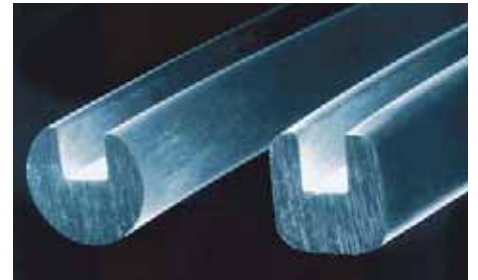
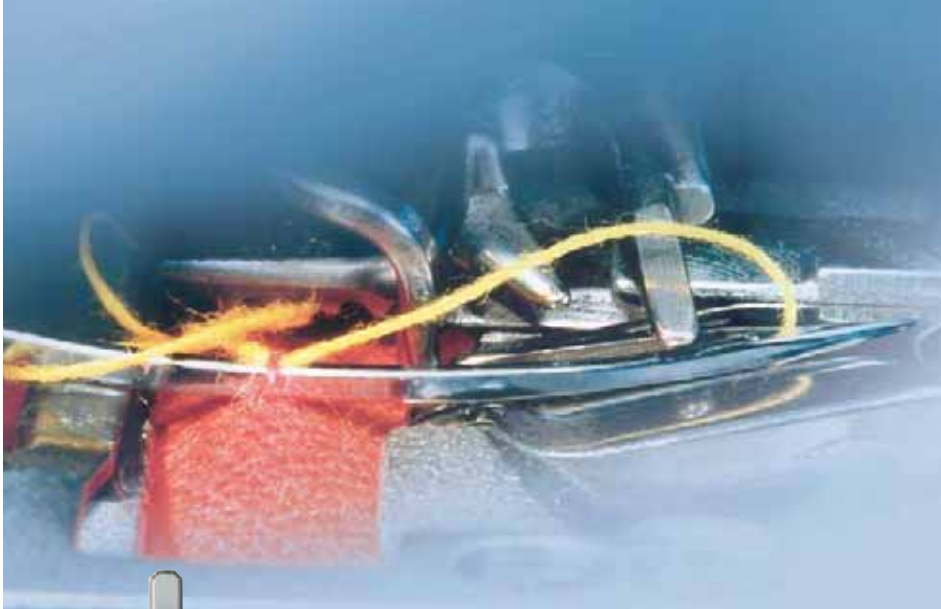
The titanium nitride coated needle of Groz-Beckert  
The titanium nitride coating provides the Groz-Beckert GEBEDUR® needle with high protection from wear and tear as well as damage.

### The results are:

- High seam quality
- High productivity



## THE ADVANTAGES OF THE SQUARE BLADE NEEDLES (V-NEEDLES)



COMPARISON OF CROSS-SECTIONS

### CROSS-SECTION OF BLADE

The development of the Groz-Beckert square blade needle (=V-Needle) has created new possibilities to combine needle stability and gentle fabric handling.

**The square needle blade offers a rigidity considerably higher as compared to a conventional round blade of equal cross-sectional area.**

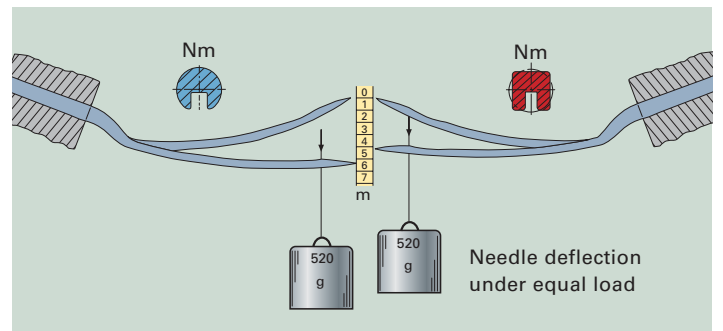
### LOADING CAPACITY

A very distinct advantage in needle stiffness becomes evident in a mechanical experiment.

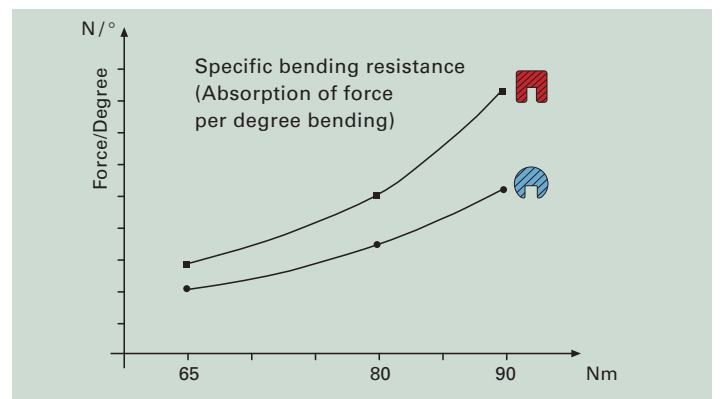
Such features support the needle function during the sewing process. The resistance against bending forces of a V-needle Nm 65 almost reaches the resistance of a conventional size Nm 80 needle. Therefore, in many cases a V-needle size Nm 65 can be used where up to now a needle size Nm 80 was imperative for stability reason. Or, a V-needle size Nm 80, now has the functional rigidity of a regular size Nm 90 needle. The cross-sectionally thinner V-needles require less space during penetration.

So, they stretch and displace the textile fibres to a lower degree than round blade needles of comparable stability. Blindstitch seams without distortion on thin and critical cloth become possible.

**Needle life and the machine performance are enhanced when standard needles are replaced with V-needles of same size.**



NEEDLE DEFLECTION



SPECIFIC BENDING RESISTANCE



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## DISTINGUISHED WORLD-WIDE FOR PRECISION

Wherever textiles are manufactured and processed, our products guarantee an efficient and smooth production process. The secret behind this is more than 150 years of experience, well over 60,000 product types, and the expectation we have of ourselves to produce ultimate precision. All this has made Groz-Beckert a reliable partner to machine constructors and the textile industry.

Today, more than 7,000 employees all over the world contribute to ensuring that the quality is right. Our products are sold in more than 150 countries, either through our own subsidiaries or by reliable retail partners.

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