



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.

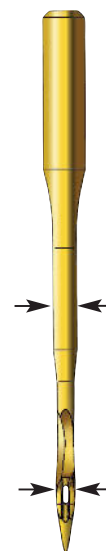
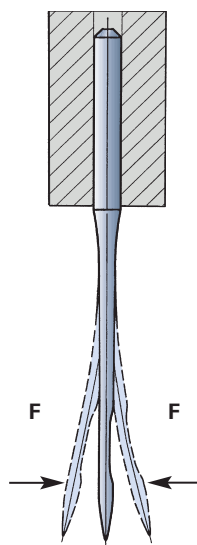
To avoid these problems, a new blade design was developed for the Groz-Beckert **SAN® 5**. The stipulation was high needle stability in combination with an optimum of penetration work.

Results can be:

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



STANDARD



SAN® 5

CROSS SECTION OF THE SCARF

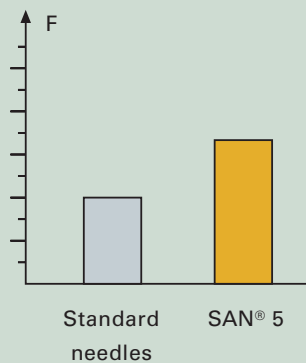
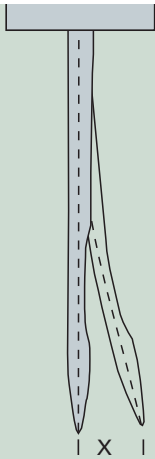
The higher stability of the SAN® 5 in the scarf area becomes visible in this cross section view of the scarf. The lateral scarf chamfer prevents damage to the hook point.



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.

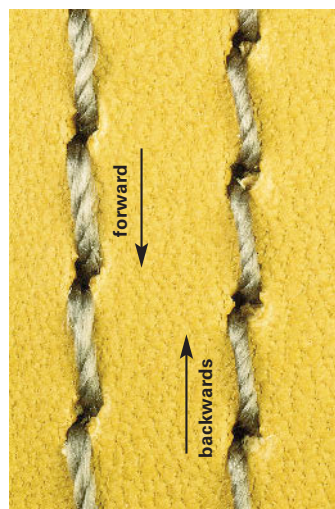
A needle deviation of "X" with SAN® 5 needles requires approximately 25 % higher force than with standard needles.

THREAD TWIST SHIFTING

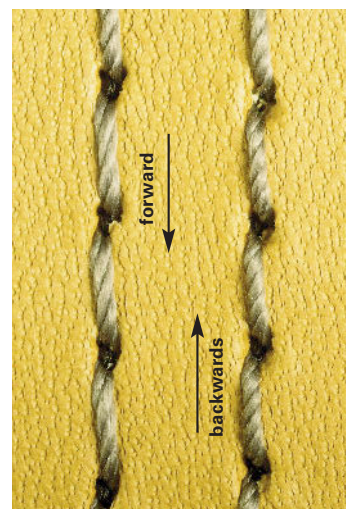
The SAN® 5 needle has a specially designed upper point groove. The edges of the eye lie deeper into the direction of the point. All thread-sliding areas are very well-rounded and polished. The needle thread slides protected over this specially shaped area.

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.

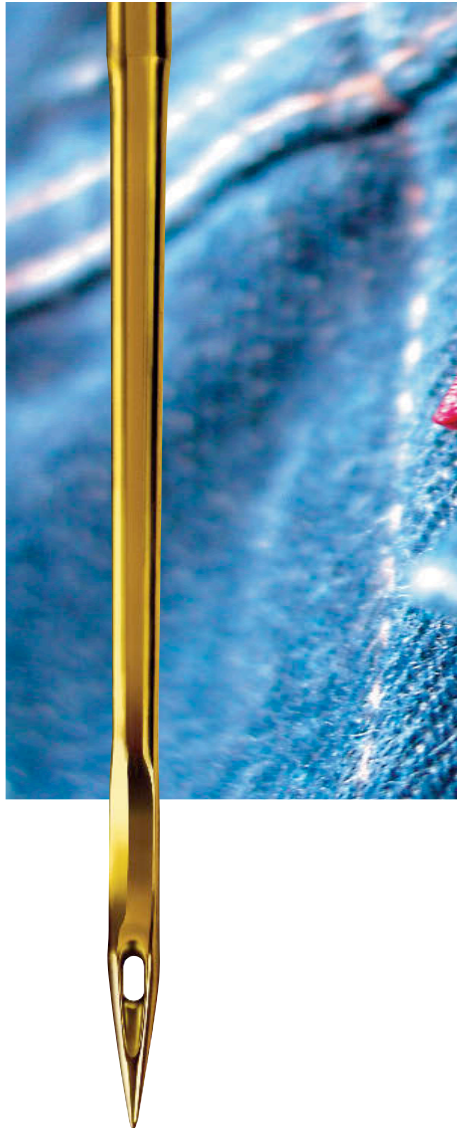


SEAM DIRECTION STANDARD



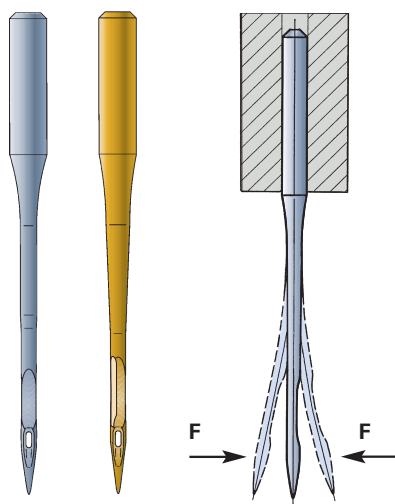
SEAM DIRECTION SAN® 5

THE SAN® 6 GEBEDUR®

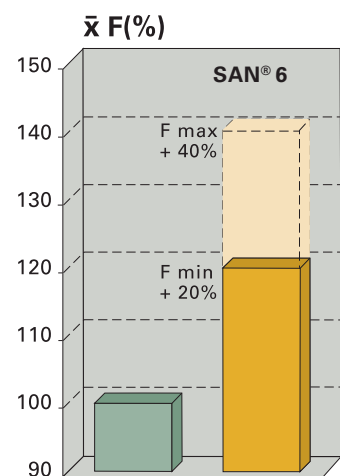


BLADE PROFILE

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.



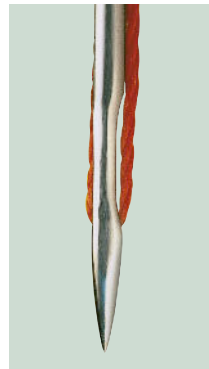
Scarf and blade profile prevent needle breakage, skip stitches and thread breakage. The looper point is protected.



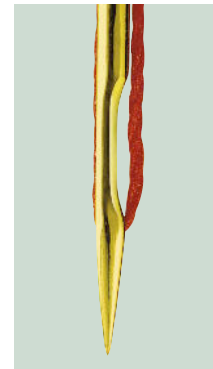
IMPROVED LOOP FORMATION

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.

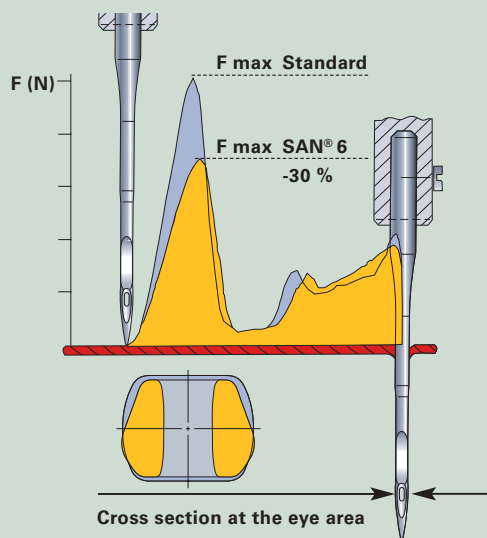


STANDARD



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

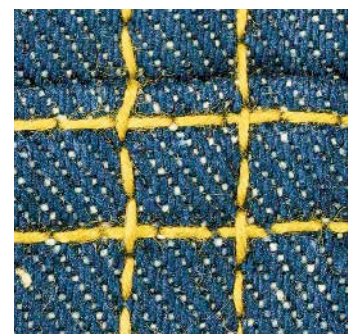
With the slim and rounded RG-point and the special blade shape the SAN® 6 stands for:

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



STANDARD

SAN® 6



STANDARD

SAN® 6

THE SAN® 10 – OPTIMAL CHOICE FOR DELICATE FINE KNITWEAR



Guideline: as thick as possible and as thin as necessary.

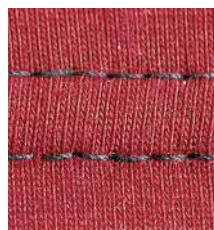
Using very thin standard needles can solve quality problems at the expense of output.



Checking seams: slight pulling and shearing movements make material damage visible (photo bottom left).

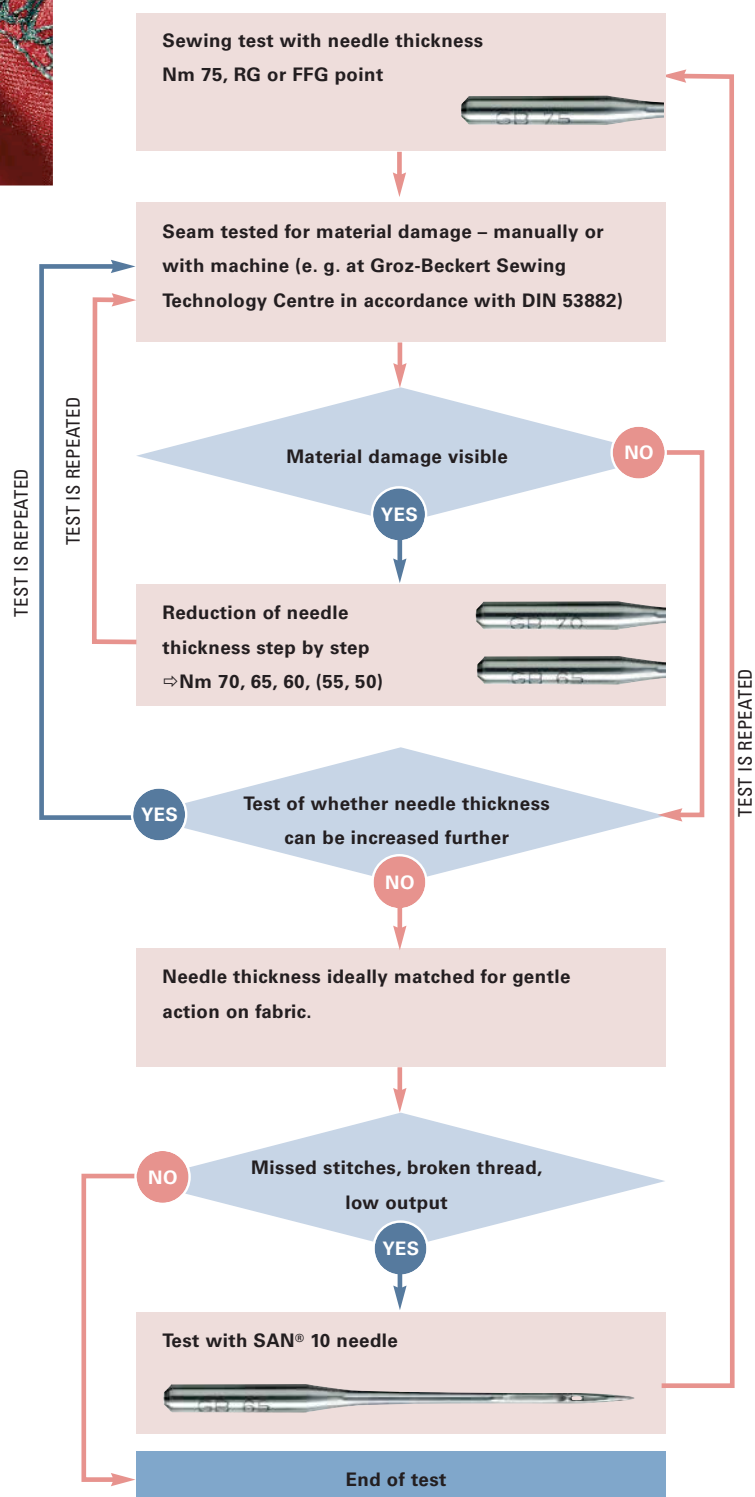


Stitches in the knitting are damaged – test is continued with the next size down of needle thickness.

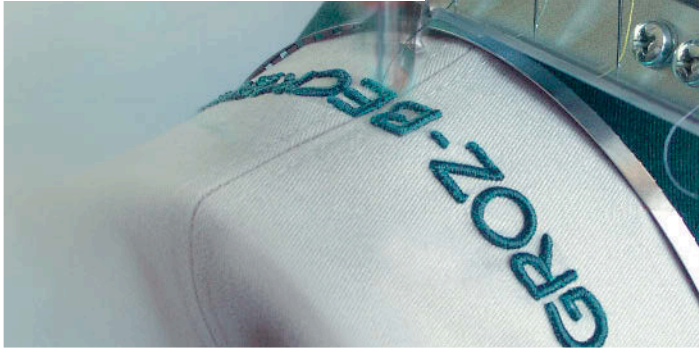


No more material damage visible – correct needle thickness has been found.

TEST SEQUENCE USING MATERIAL DAMAGE AS AN EXAMPLE



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
- 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® 1 GEBEDUR® | DB x K5 KK |
|---------------------|--|--|---|
| Shank length | Standard | Standard | short |
| Point style | RG (Standard) | RG (Standard) | RG (Standard) |
| Coating | Chrome | Titanium-Nitride | Chrome |
| Application | 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) |

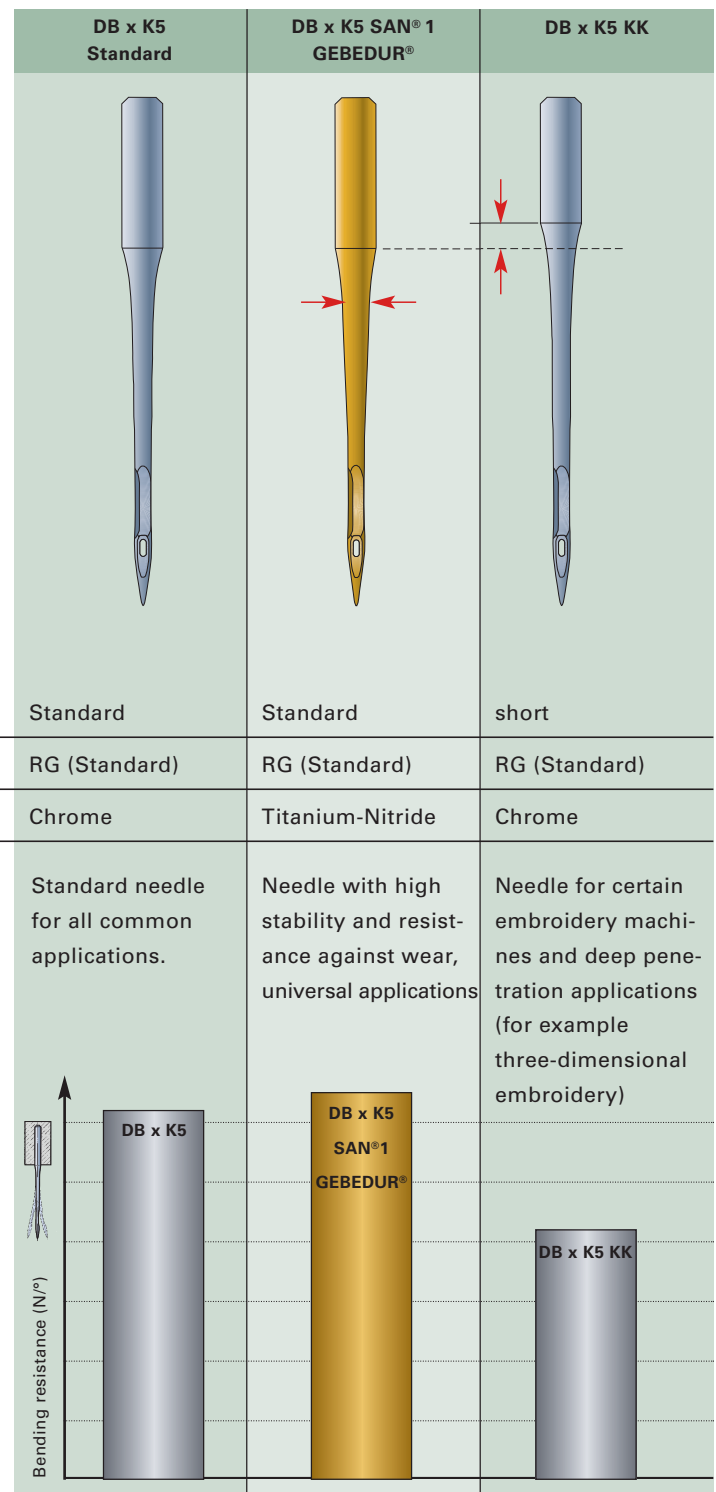
STABILITY COMPARISON OF THE GROZ-BECKERT STANDARD DB x K5 AND ITS VARIATIONS

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.

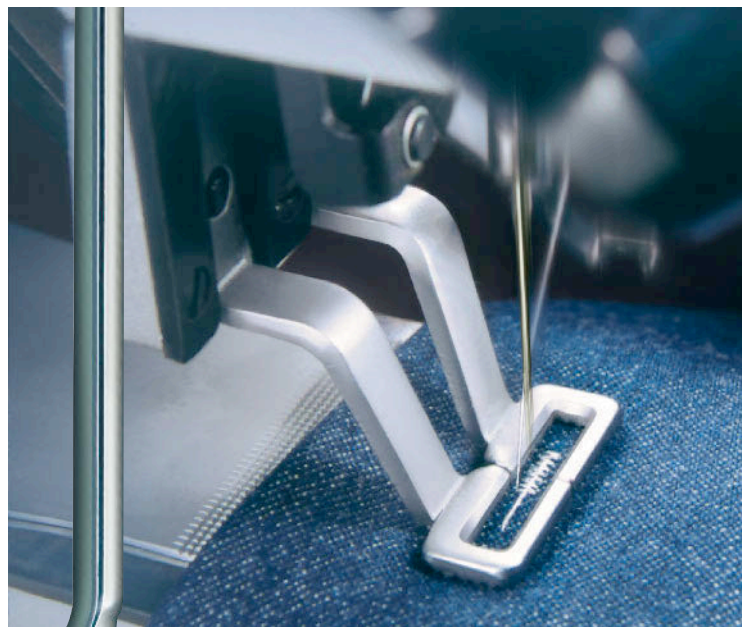
The Groz-Beckert SAN® 1 GEBEDUR®, with its special design and a titanium nitride coating, offers highest stability and maximum resistance against wear.

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 SPECIAL APPLICATION NEEDLE MR



FOR AUTOMATED SEWING PROCESSES WITH MULTIDI- RECTIONAL FEEDING SYSTEMS



Computerized sewing machines are capable of producing seams with frequent changes of sewing direction at a constant sewing speed. This type of operation is known as multidirectional sewing

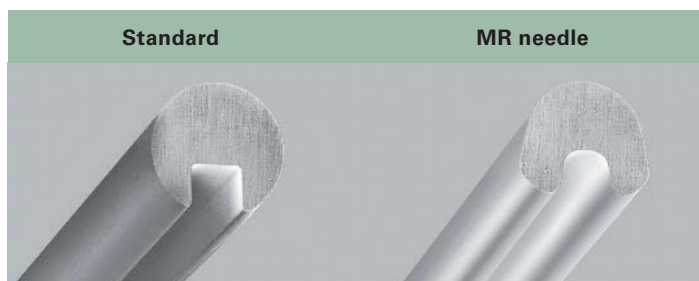
STABILITY

With its special blade and scarf geometry, the Groz-Beckert MR needle offers outstanding bending resistance (deflection resistance), lending it extreme stability over its entire working area.

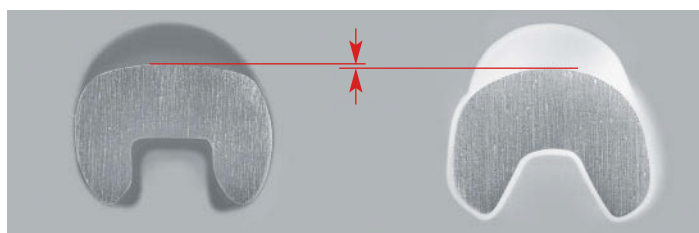
Added to this is an unusually deep and extended scarf. This permits extremely tight adjustment of the looper to the needle. The deep thread groove, extending also into the eye area, guarantees optimum protection of the thread.

Benefits:

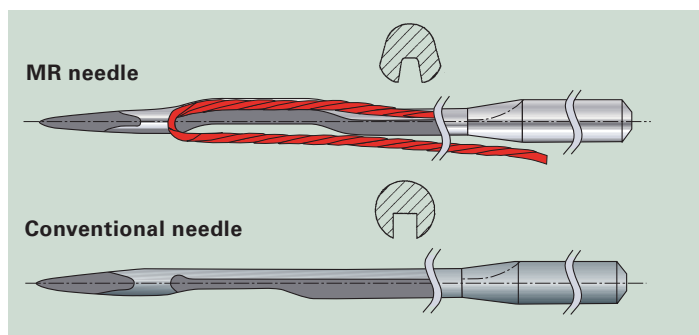
- Less needle deflection
- Less needle breakage
- Less skip stitches
- Less thread breakage



BLADE CROSS-SECTION

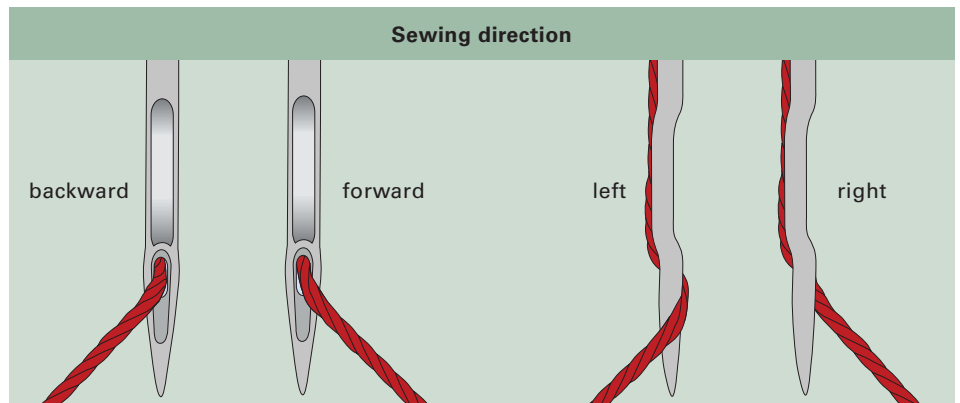


SCARF CROSS-SECTION



THREAD LOADING

When changing the sewing direction, the sewing thread is pulled out of the needle eye in different directions. During its downward stroke, the needle slides along the tensioned sewing thread. This can result in changes in the thread twist, and consequently to instable loop formation.

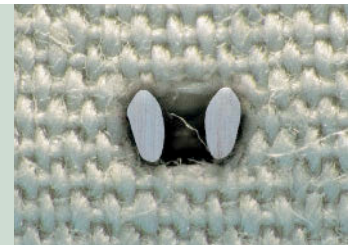


CROSS-SECTION AT CENTRE EYE

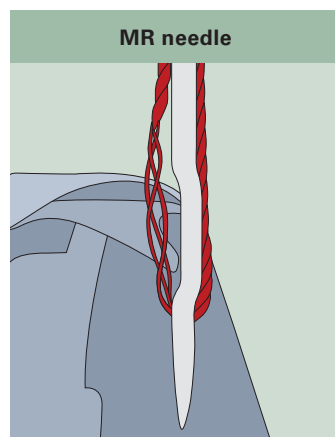
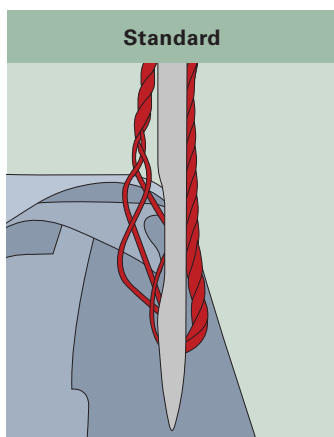
When penetrating the material, a needle reaches its maximum penetration force in this needle area. This increases to a disproportionately high degree as needles with a bigger size and consequently a bigger cross section at centre eye are used. The MR needle has been designed to ensure that its penetration force remains significantly below that of a standard needle.



STANDARD



MR NEEDLE

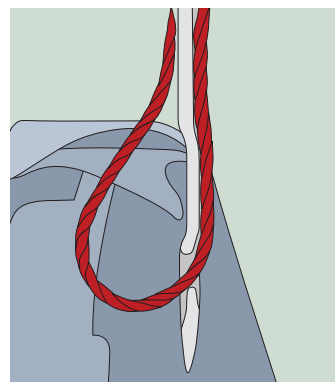
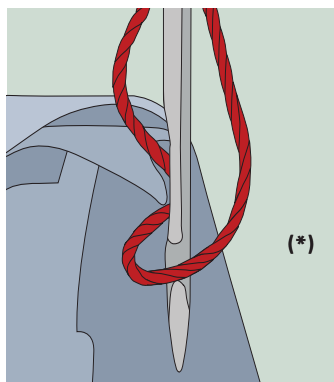


THREAD PICKUP

Difficult sewing operations can result in the thread unwinding during loop formation. Single yarns or filaments can be picked up and torn off by the looper point. The risk of unwinding is reduced by the special thread guiding area of the Groz-Beckert MR needle. Its extreme scarf depth permits very tight looper adjustment, resulting in optimum security during loop pick-up.

Benefit:

- Less thread splicing and thread breakage



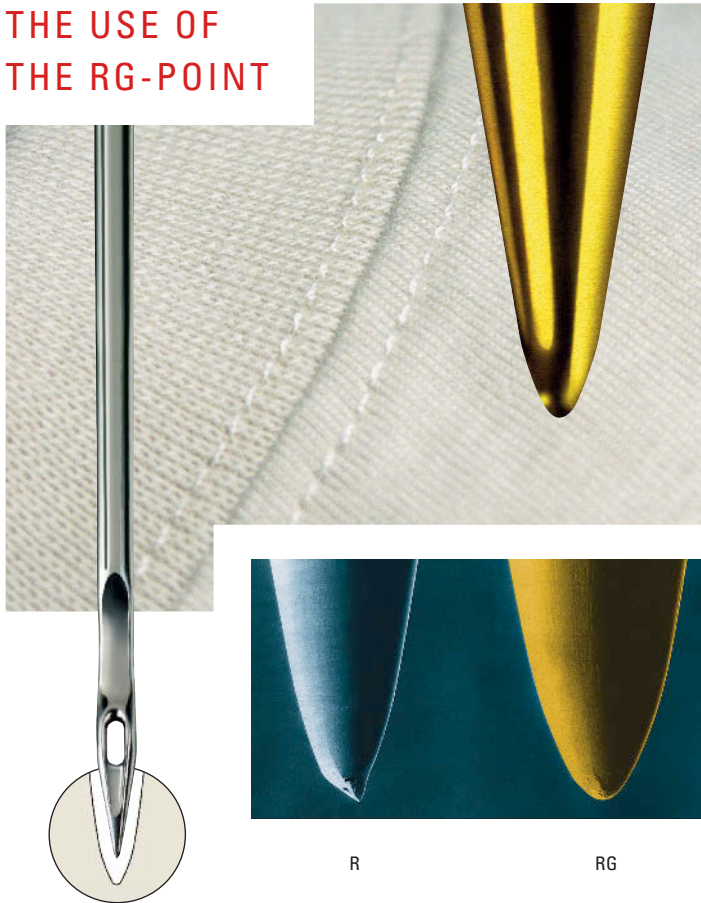
LOOP FORMATION

The special asymmetrically shaped thread sliding area inside the eye of the Groz-Beckert MR needle guarantees stable loop formation even under unfavourable sewing conditions, eliminating the possibility of negative loop formation (*) and thread twist.

Benefit:

- Fewer skipped stitches

THE USE OF THE RG-POINT

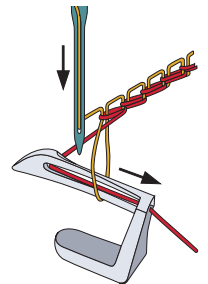


USE IN CHAIN STITCH MACHINES:

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:

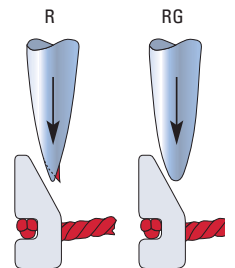
- Less material damage, reduced penetration force
- Less needle deflection (skip stitches, needle breakage)
- Higher process security, with less machine downtime



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.



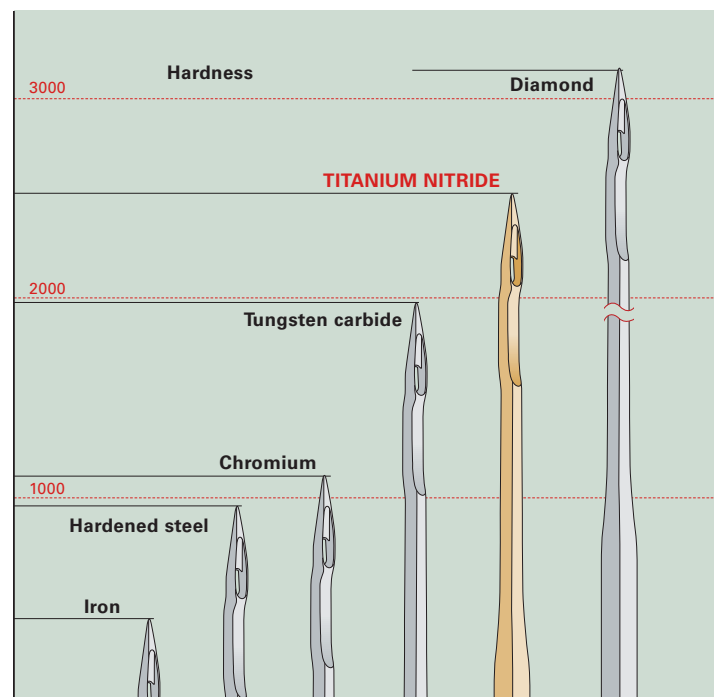
COMPARISON OF THE GEBEDUR®-COATING IN HARDNESS



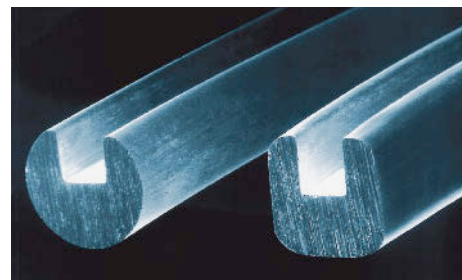
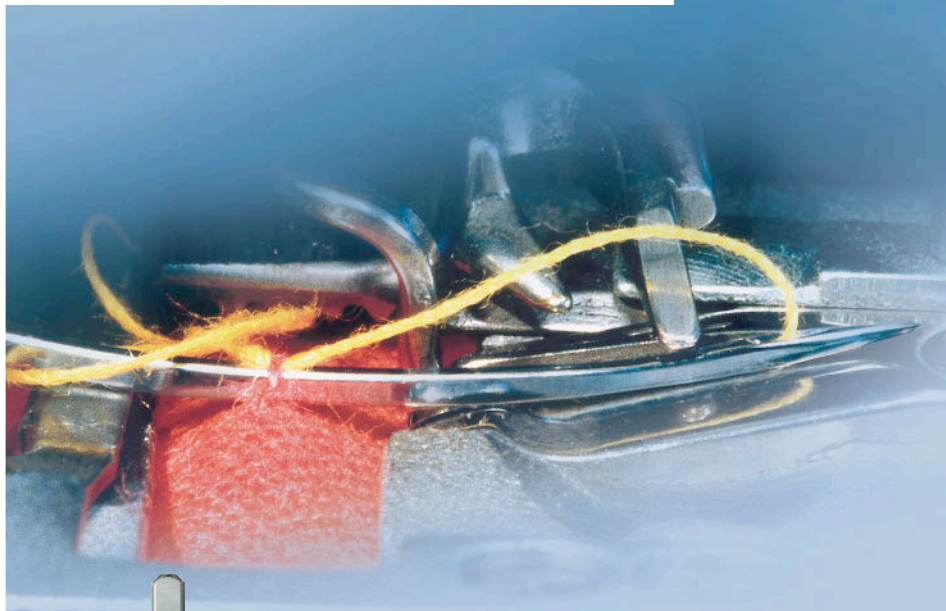
The titanium nitride coated needle of Groz-Beckert. The titanium nitride coating provides the Groz-Beckert GEBEDUR® needle with high protection from wear and tear as well as damage.

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.

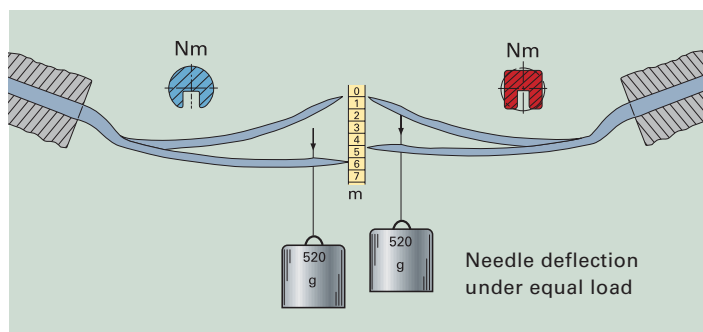
LOADING CAPACITY

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

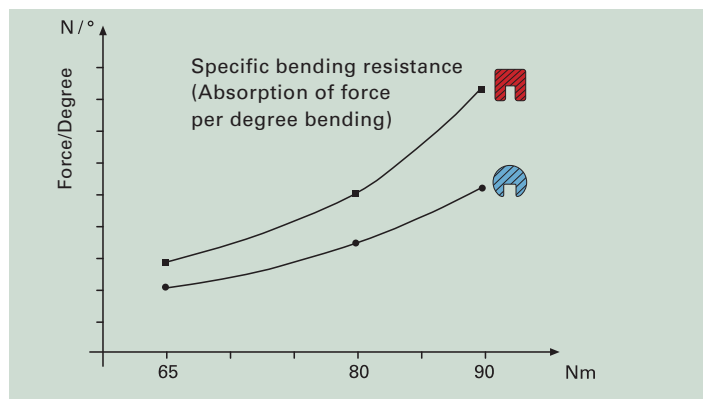
Such features support the needle function during the sewing process. The resistance against bending forces of a V-needle Nm 65 almost reaches the resistance of a conventional size Nm 80 needle. Therefore, in many cases a V-needle size Nm 65 can be used where up to now a needle size Nm 80 was imperative 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

KNITTING , WEAVING , FELTING , TUFTING , SEWING

GROZ-BECKERT KG

PO Box 10 02 49

72423 Albstadt, Germany

Phone +49 7431 10-0

Fax +49 7431 10-3200

contact@groz-beckert.com

www.groz-beckert.com

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