



## NEEDLES FOR SINGLE- AND MULTIHEAD EMBROIDERY



With today's machines in the field of single and multihead embroidery there is no limit to creativity. This is also the reason why during the past years the variety of different embroidery materials has increased rapidly.

Especially three-dimensional embroidery, embroidery on leather and technical textiles with different layers of material and coatings, combined with high machine speeds, is in many cases an extreme challenge for the embroidery machine needle.

In design and precision Groz-Beckert embroidery machine needles have adopted the requirements of the market.

### Market requirements are:

- Optimum embroidery appearance
- High functional safety
- Reduced needle breakage
- Reduced thread breakage
- Reduced machine downtime
- High production efficiency

## THE DB X K5 AND ITS SPECIAL FEATURES

### Variations of the DB x K5

The original needle for single- and multihead 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 and thread breakage
- Maximum protection of thread and material
- Safe thread loop pick up
- Best universal point style
- Eliminate looping
- Optimum stitch fill (no gaps)

### The features and applications of the DB x K5

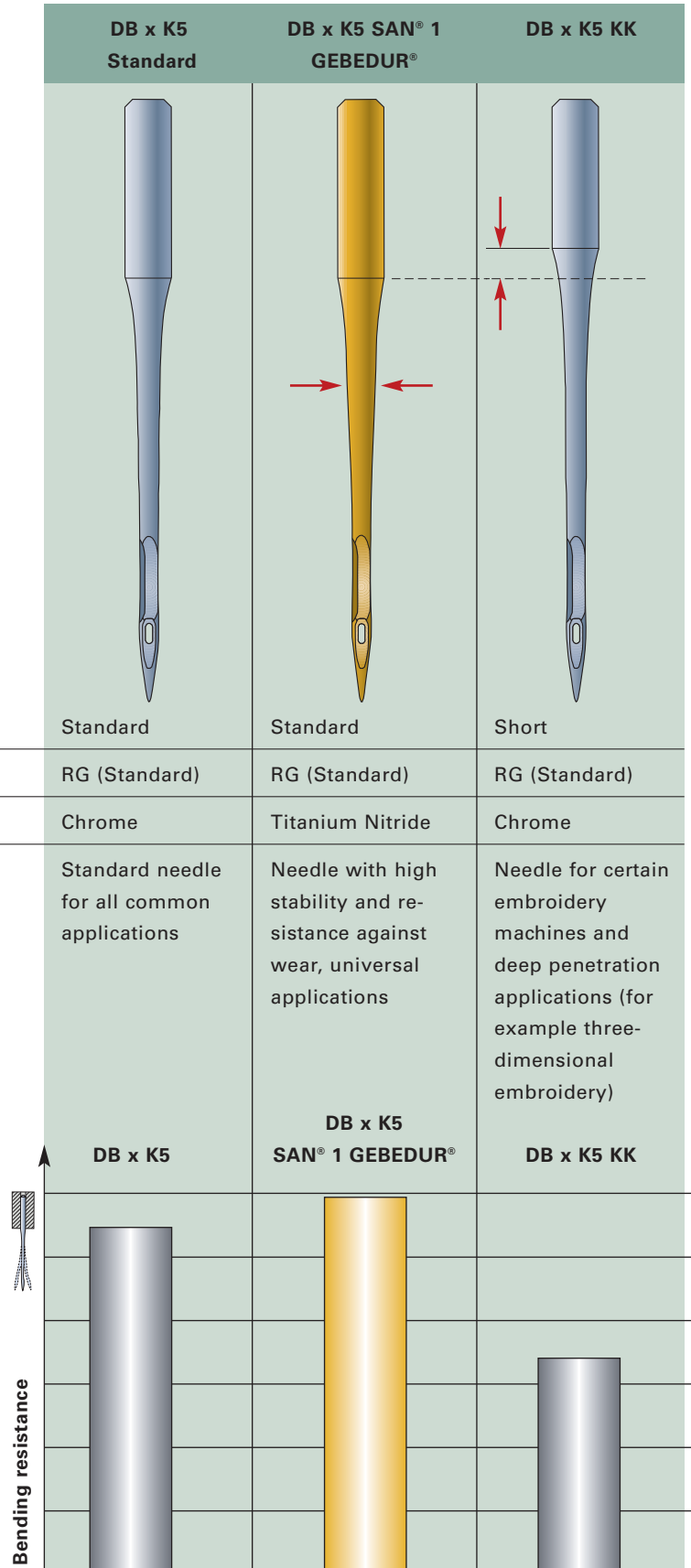
	DB x K5 Standard	DB x K5 SAN <sup>®</sup> 1 GEBEDUR <sup>®</sup>	DB x K5 KK
Shank length	Standard	Standard	Short
Point style	RG (Standard)	RG (Standard)	RG (Standard)
Coating	Chrome	Titanium Nitride	Chrome
Application	Standard needle for all common applications	Needle with high stability and resistance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

### Stability comparison of the 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 SAN 1<sup>®</sup> GEBEDUR<sup>®</sup>, with its special design and a titanium nitride coating, offers highest stability and maximum resistance against wear.

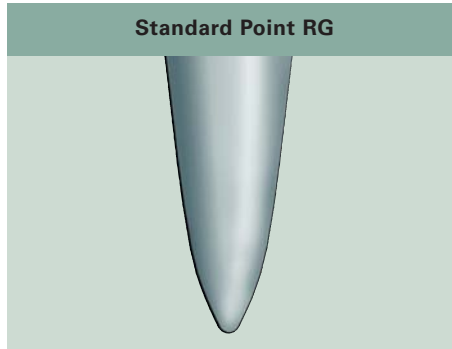
The blade design of the "KK" version corresponds to the standard DB x K5 needle. However, due to its shorter shank, bending resistance is lower.



## THE POINT STYLES OF THE DB X K5

### Standard point RG and point variants

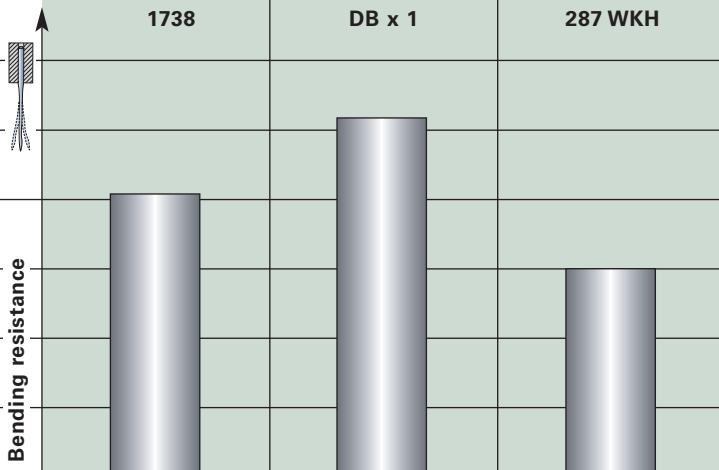
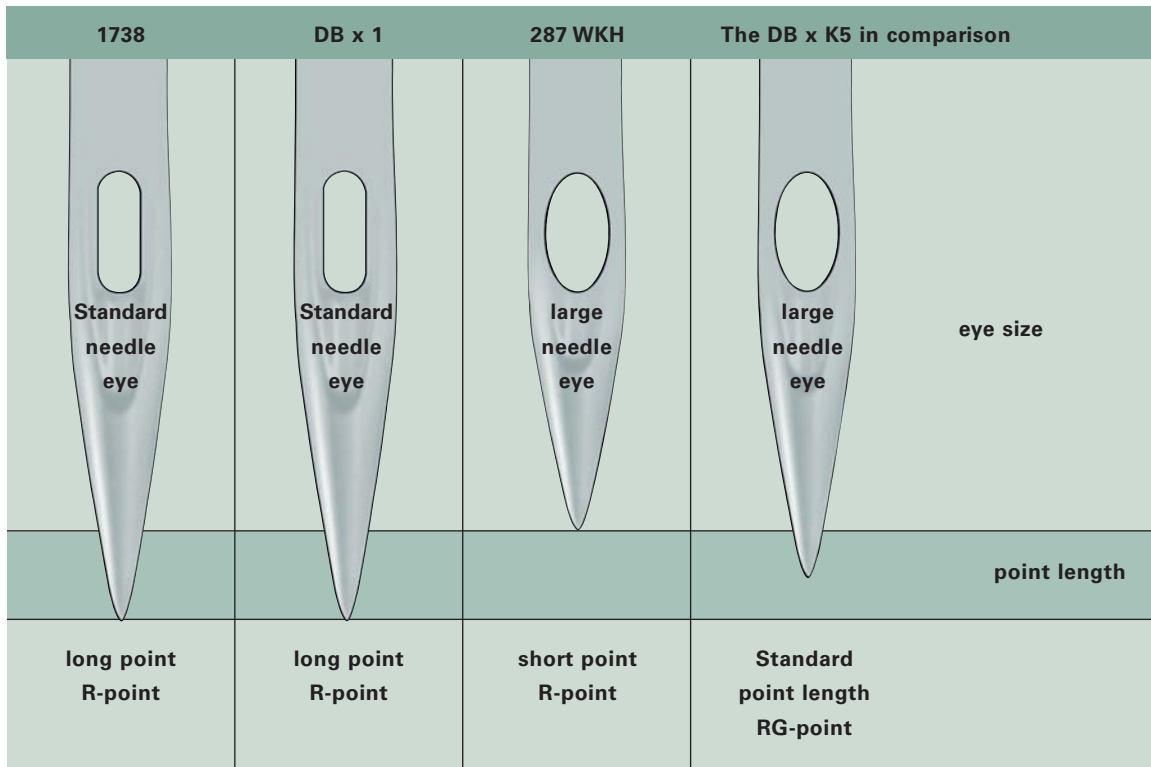
In various application tests the RG-point proved to be the most suitable point across a variety of materials. Therefore the RG-point is the standard point style for Groz-Beckert embroidery needles.



For other applications the following point styles are available:

- FG / SUK
- FFG / SES
- R

### Other needle systems for embroidery



### The needle stability

The other needle systems here were not specifically designed and produced for embroidery. Their application related features are designed for the use in single needle lockstitch machines. Nevertheless, many embroidery factories still use these needles today.

Their stability, defined as resistance against bending, is shown in the diagram opposite and can be compared with the DBxK5 variations.

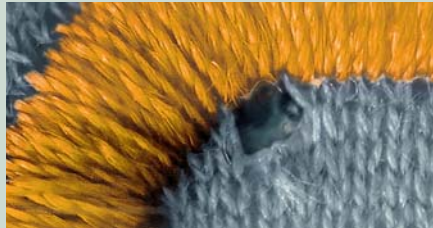
## KNOWN APPLICATION PROBLEMS AND POSSIBLE SOLUTIONS

### On knitwear

To avoid material damage when embroidering knitted fabrics, it is recommended in most cases to use needles with a ballpoint. On fine knitwear the standard point RG (also FFG) and on coarse knitwear the FG-point.

In addition, needle size has a big influence on material damages. It goes without saying; tests with the requested needle size should be done before starting production.

#### Material damage



A needle point which is too sharp will create loop damage or needle cuts. A needle, which is too thick will push out the loop under tension and break it.



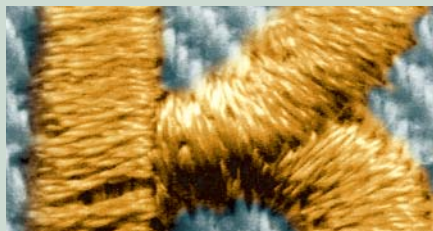
A DB x K5 size 65 with RG-point was used on this fine knitwear, the result is a nice embroidery design without any damage.

### On woven fabric

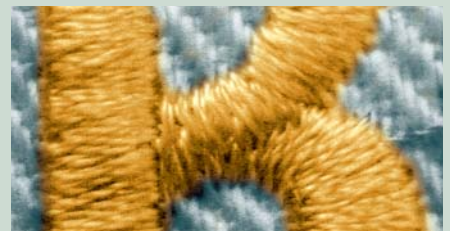
Whether on fine or heavy woven fabrics, if the ballpoint is too big or the used needle too thin, problems will occur during the embroidery operation. Irregular appearance of the embroidery design, thread breaks and also needle breakage can be the result.

High stability and at the same time maximum material protection are required! Features which the needle system DBxK5 offers in all sizes.

#### Irregular embroidery appearance



Needle deflection caused by a needle which is too thin or a ballpoint which is too big results in an irregular embroidery design.



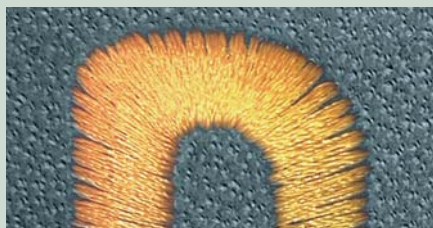
A DB x K5 75 with RG-point was used on this woven fabric, the result is an excellent embroidery design.

### On leather

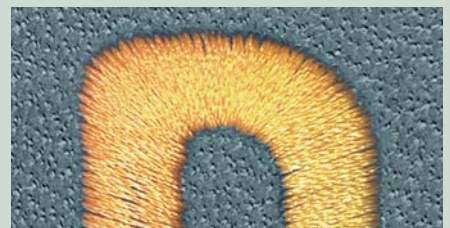
Cutting points are not suitable for this application. The changes in the stitching direction will result in previously sewn threads being cut, excessive perforation of the leather and irregular stitch hole openings. On fine and medium hard leather the RG- and R point are proven and on hard leather the R point is recommended.

Penetration forces through leather are relatively high, so needles must offer highest stability. The DB x K5 and in particular the DB x K5 SAN® 1 GEBEDUR® meet this requirement.

#### Irregular embroidery appearance



When using a cutting point on embroidery, lengthways and across the grain, the cuts in the leather are different. In extreme cases, the design can be completely cut out from the leather.



A DB x K5 SAN® 1 GEBEDUR® with RG-point was used on this leather, the result is an attractive and consistently top quality embroidery design.

## 3-D EMBROIDERY

### Highest demands are put on a needle in three-dimensional embroidery

In order to achieve the 3-D-effect foam material is positioned on the embroidery base before being over-stitched. The adhesion and the foam material leads to higher friction, not to mention the variety of thickness the needle has to contend with. In addition these embroidery designs often have to traverse panel seams in caps. Therefore the many forces placed upon the needle (and embroidery threads) can and do vary in the extreme. For this sort of application the embroidery needles need to fulfil the following requirements:

#### Lower penetration force

- Material protection

#### Raise (highest) stability

- Eliminate skipped stitches
- Reduced needle breakage
- Precise embroidery fill

#### High resistance against wear

- Long lifetime



Besides Groz-Beckert's standard DBxK5 needle, these demands are further reduced as problem areas by using the DBxK5 SAN® 1 GEBEDUR®.

### Removal of foam material

After over stitching, the foam material is taken away from the embroidery. Any remaining parts of the foam material are removed carefully from the embroidered design.



### The three-dimensional embroidery result

Now the 3-D image is available. An acceptable result is only achieved with precise stitching. Thread is covering the foam material without gaps and no stitches looped. The material must not be damaged and the 3-D-effect must be uniform.



