NEEDLES FOR THE PROCESSING OF LEATHER

PERFECT SEAMS FOR ALL APPLICATIONS

The leather worker's trade is one of the oldest in the world.

These days in most of the cases the fashion industry decides about the seam appearance, besides good durability. A good seam construction should also offer a decorative seam appearance. In order to guarantee economic production, such seams are produced on modern machines and with high machine speeds.

Customer's requirements are in general permanent production security with minimum machine downtime and constant product quality. The following demands are given priority during the constructive and sewing development of the needle:

- Minimum needle breakage
- Minimum skip stitches
- Minimum thread breakage
- Quality of the cutting point (sharpness and position)
- Maximum lifetime

The results of this research and development work are realized in today's Groz-Beckert cutting point needles.

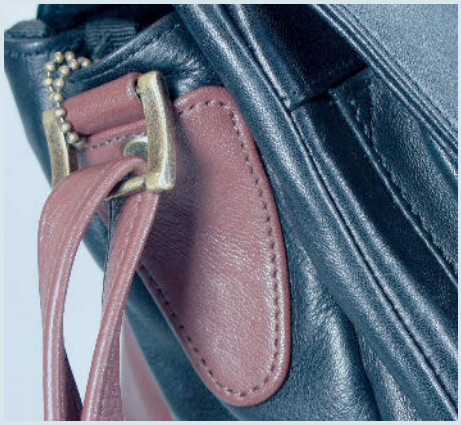
THE SELECTION OF THE CORRECT NEEDLE POINT

Based on the sort of leather and its composition

Soft leather

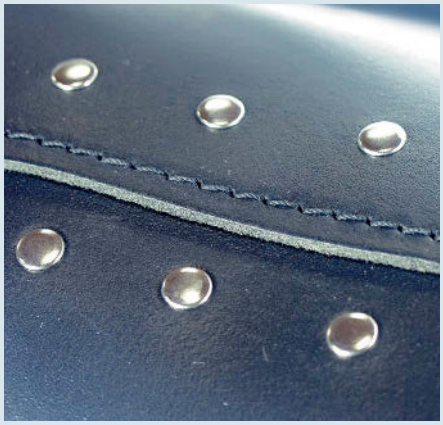
Recommendation:
R, SD (LL, LR)

Leather with medium hardness



Recommendation:
Depending on the requested seam appearance, all cutting points can be used.

Hard and thick leather



Recommendation:
LR, VR, D, DH, DI

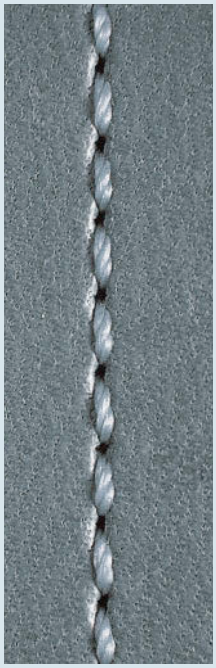
Based on the demands on seam appearance

Straight stitches

Slanted stitches

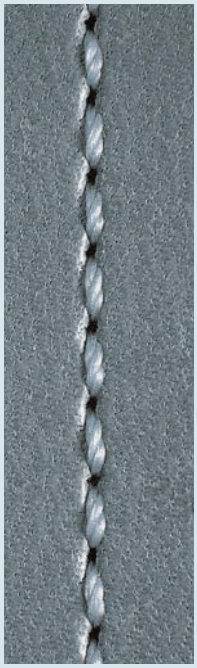
Filled stitch holes

Open stitch holes



Elevated stitches

Deep-set stitches

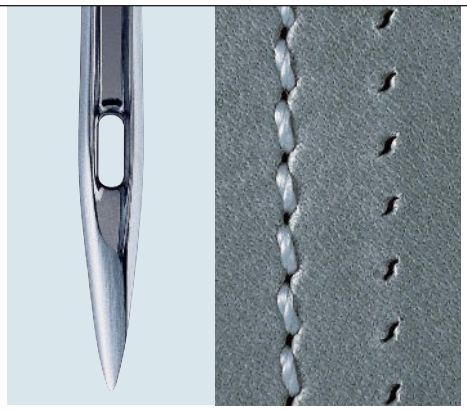


The pictures illustrating seams shown here and on the following pages, are based on the common threading direction from left to right. → Seams were produced on leather of medium hardness.

THE RIGHT NEEDLE POINT FOR THE REQUIRED STITCH APPEARANCE

LR - point

Cuts the leather to the right at a 45° angle in the direction of sewing. Slight to medium slanted stitch formation, depending on the leather. The sewn thread is slightly elevated. Stitch holes are easily visible. Suitable for short to medium stitches.



Application field:

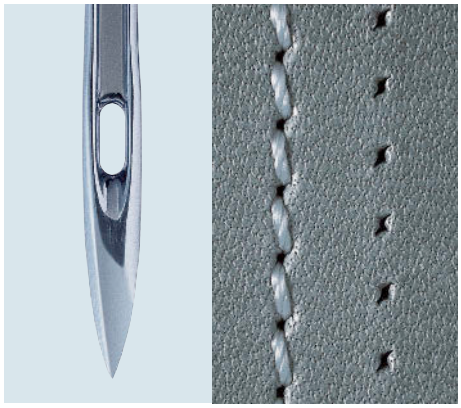
For the production of decorative seams on soft to medium/hard leather. Can be used on almost every type of leather.

Example:

Shoes, bags and leather garments, trekking shoes, suitcases, ...

VR - point

Technically obsolete point style. Cutting effect, seam appearance and seam characteristics identical to LR-point.

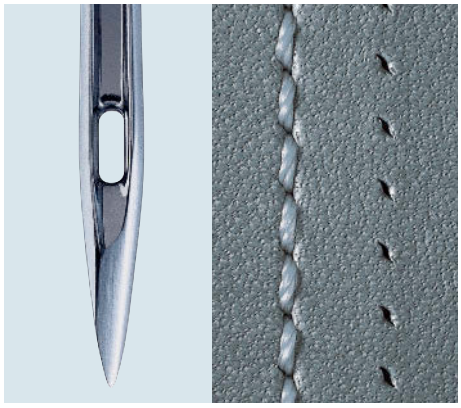


Application field:

Formerly recommended for hard leather. High quality LR-points are unconditionally applicable for these leather types.

LL - point

Cuts the leather to the left at a 45° angle in the direction of sewing. Straight stitch formation. The sewn thread is slightly elevated. Stitch holes are filled. Suitable for medium to short stitches.



Application field:

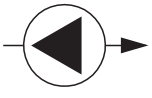
For the production of straight seams with a continuously closed seam appearance. Can be used on almost every leather type.

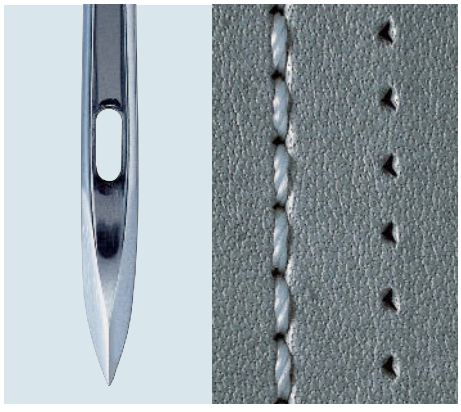
Example:

Bags, shoes and car seats...

D - point

Cuts the leather with a prominent triangular shape. Straight stitch appearance. The sewn thread is slightly elevated. Stitch holes are relatively large. Medium to short stitches possible.





Application field:

Suitable for straight sewing. Effective on hard and thick leather as well as cartons.

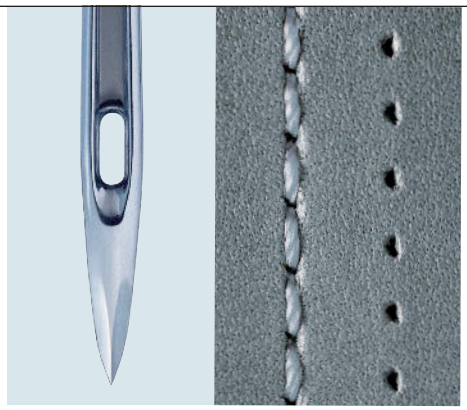
Example:

Belts, suitcases, heavy shoes and plastics...

THE RIGHT NEEDLE POINT FOR THE REQUIRED STITCH APPEARANCE

DH - point

Leather is cut with a medium triangular shape. Straight stitch appearance. The sewn thread is slightly elevated. Stitch holes are relatively large. Suited to medium to long stitches.



Application field:

Suited to producing straight seams. Good performance on medium-hard and hard leathers.

Example:

Upholstery, bags, shoes, tarpaulins, awnings and tents...

SD - point

Round set point with a small triangular tip cutting edge. Cuts leather with a slight triangular shape. Straight stitch appearance. The sewn thread is slightly elevated. Suitable for short to medium stitches.

Application field:

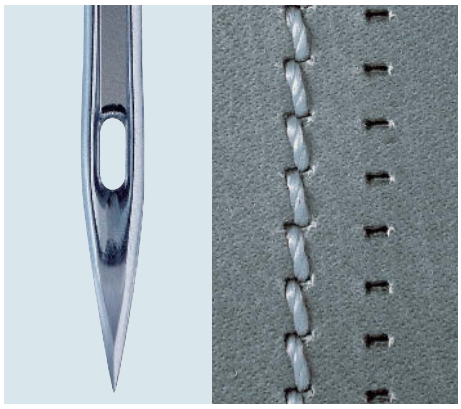
Producing stitches that are almost straight and in-line. Used on soft leather and multidirectional applications.

Example:

Shoes, leather garments, fine leather goods, leather embroidery (also on foils and laminated materials)...

P - point

Cuts the leather perpendicular to the sewing direction. On thick and hard leather it creates a prominent decorative stitch due to the heavily slanted stitch formation. The sewn thread is raised and exposed. The sewn thread fills the stitch holes. Short stitches possible.

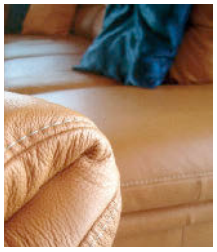


Application field:

Produces decorative stitches. Well suited for heel and closed seams.

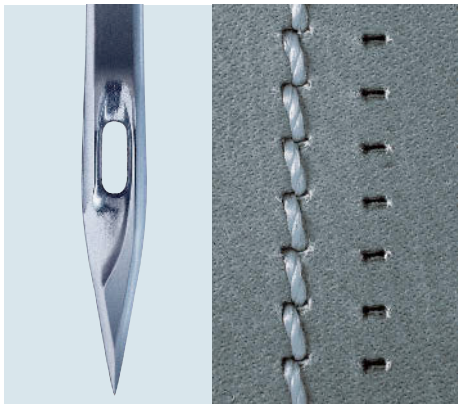
Example:

Shoes, belts and upholstery...



PCR - point

Stitch appearance same as the P-point.



Application field:

Producing decorative stitches, particularly for the left side of twin lockstitch machines.

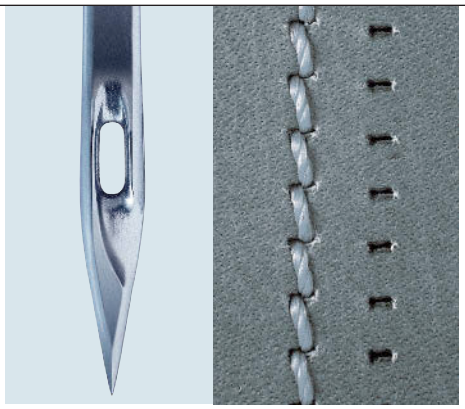
Example:

Shoes, upholstery and bags...

THE RIGHT NEEDLE POINT FOR THE REQUIRED STITCH APPEARANCE

PCL - point

Seam appearance like the P-point.



Application field:

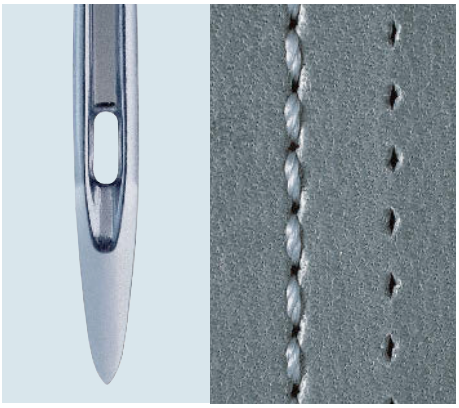
For the production of very decorative seams, especially for the right seam on twin lockstitch machines.

Example:

Shoes, bags and upholstery...

S - point

Cuts the leather in direction of sewing. Straight in-line stitch appearance. In certain leathers and with particular stitch lengths, deep-set stitches are formed. Long and visible stitch holes. Suited for medium to long stitch lengths.



Application field:

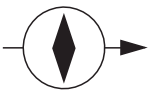
For the production of seams with deep-set, straight stitches. Suitable for most leathers.

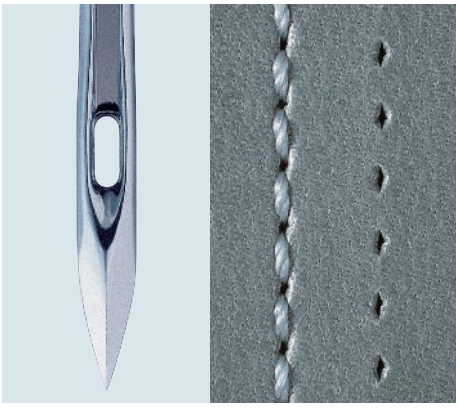
Example:

Shoes, bags, belts, leather clothes and upholstery...

DI - point

Stitch appearance similar to the S-point. Better cutting effect due to the 4 cutting edges. Precise stitches.



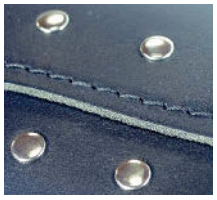


Application field:

For the production of seams with deep-set, straight stitches.
Suitable for medium and hard leathers.

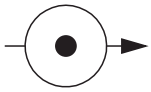
Example:

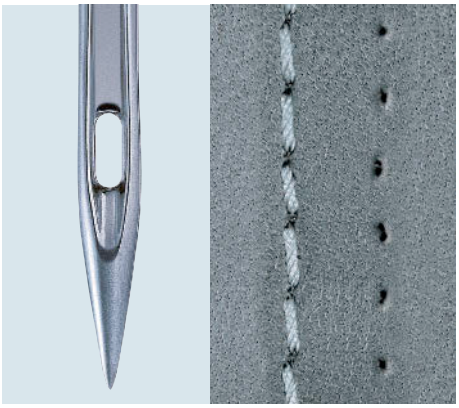
Suitcases, bags, heavy shoes...
(also for awnings)



R - point

Standard round point. Cloth point – without cutting effect. Almost straight yet irregular and variable stitch appearance. Sewing thread is slightly elevated. Irregular and inconsistent stitch holes.
Suited to medium to long stitches.





Application field:

Used on soft leather, embroidery and multidirectional applications.

Example:

Sport shoes, garments, car seats...
(also on foils and laminated materials)

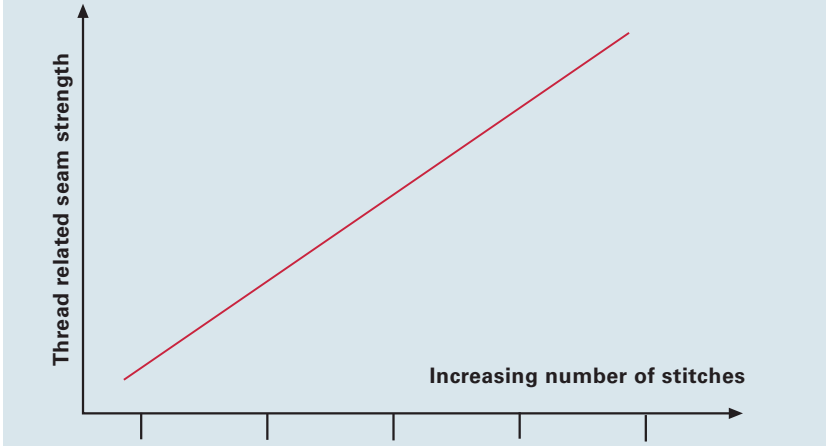
SEAM STRENGTH

The thread

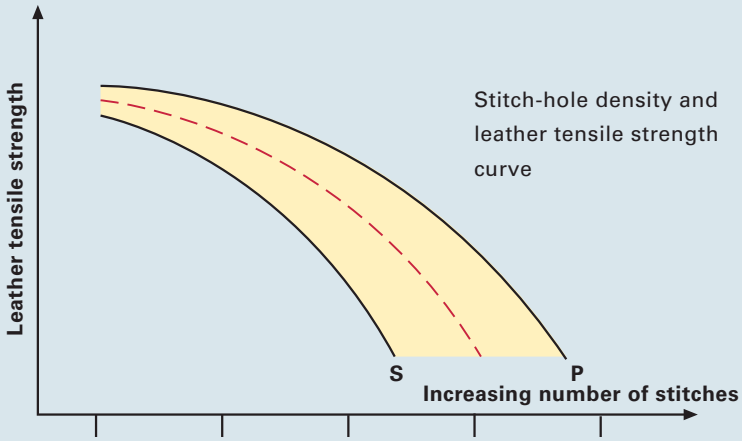
The higher the stitch rating (stitches per cm), the more thread is naturally in the seam.

Therefore, with an increasing number of stitches the thread related seam strength is also increased.

Thread related seam strength



Leather tensile strength



The leather and the needle points

The higher the stitch rating and the larger the needle, the more the leather seam is cut.

Leather tensile seam strength also depends on which point style is chosen. The highest leather tensile strength is achieved with a P-point, which cuts the leather perpendicular to the seam direction. The lowest leather tensile strength occurs with an S-point, which cuts the leather in direction of the seam (on conventional lockstitch machines).

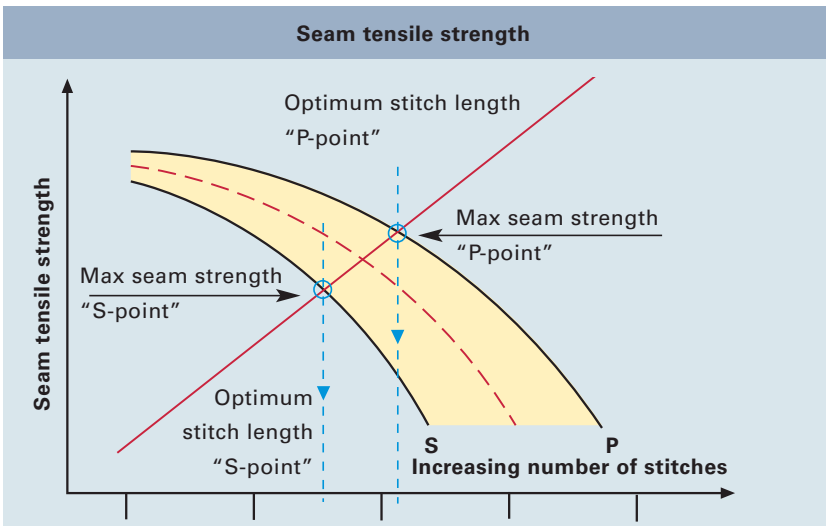
The curves of all other cutting points are between P and S.

The seam

In practise, when tearing the seam (loading crosswise) maximum seam strength is achieved when the leather and thread break simultaneously. This is the point of intersection of the thread related seam strength and the leather tensile strength depending on which cutting point is used.

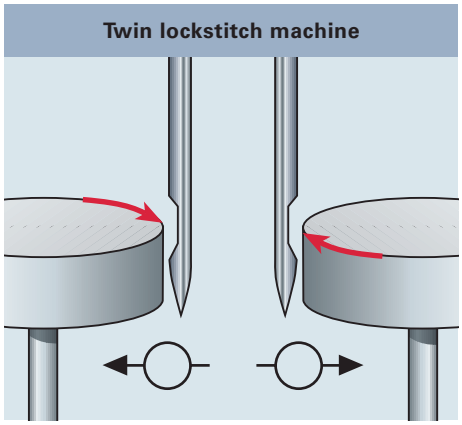
When changing the parameters cutting point and thread, the stitch length has to be adjusted to achieve the maximum seam strength again.

Seam tensile strength



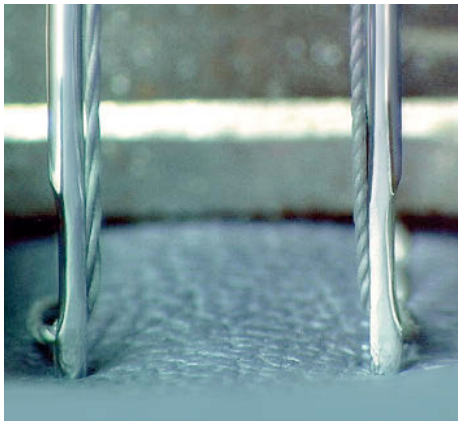
SEWING OF LEATHER ON TWIN LOCKSTITCH MACHINES

Twin lockstitch machines produce two parallel rows of stitches simultaneously. Ideally, the left and the right should have the same appearance. Due to different mechanical sewing principles between the left and the right needle, a seam appearance that is exactly the same is not normally possible.



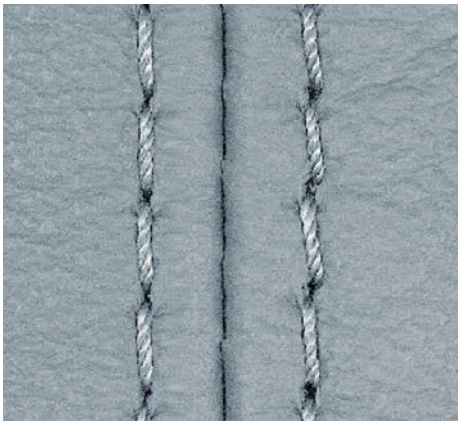
Different loop pickup

- For the machinist the left needle is threaded from right side to left. The needle thread loop is penetrated by the hook point and then pulled out against the direction of the material feed.
- The right needle is threaded from the left side to right. The needle thread loop is pulled out in the direction of the material feed.



Twist shifting

- During the down-stroke the sewing thread of the left needle is pulled over the right edge of the eye and the sewing thread of the right needle is pulled over the left edge of the eye.
- When using normal “Z” ply-twist threads, the left needle produces an opposite rotational force than the right, creating a different ply-twist shift in the thread. Generally the heavier the thread the more pronounced this effect becomes.
- By using a CR-point designation on the left hand needle, the ply-twist shifting can be reduced slightly.



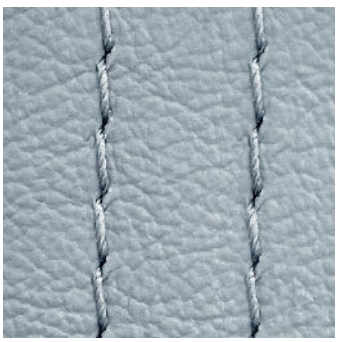
R - point

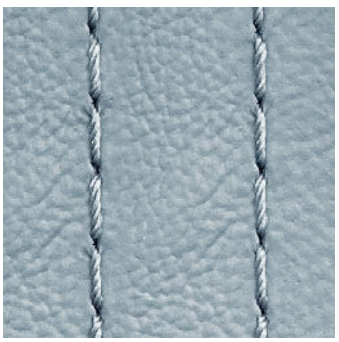
When using a standard round point-R, the left-hand side stitches are usually less slanted than the right. The left row of stitches demonstrates stronger ply-twist shifting (untwisting).
The degree of stitch appearance differences depends on the properties of the thread, the leather and the selection of the point style of needle.

Needles with cutting points produce greater consistency of stitch appearance.
This is most visible with the cutting points:

LR - cutting point (on both sides)

Stitch to stitch, left and right stitches are regularly slanted towards the left.
This results in an attractive seam of two duplicated rows of stitches. Stitch holes are easily visible.



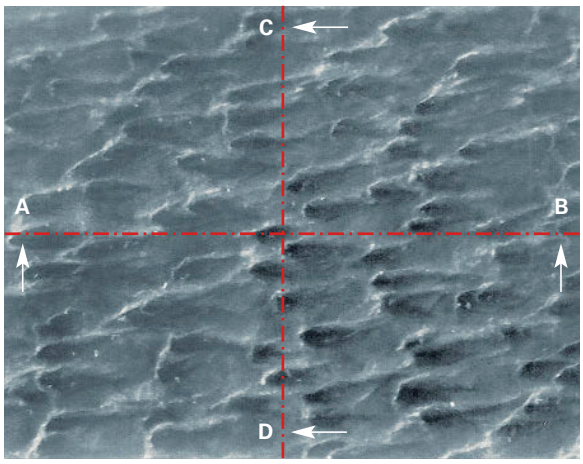


LL - cutting point (on both sides)

An LL cut in leather and the resultant stitch knot form produce thread twisted into this cut and towards the direction of the seam. This results in a stitch appearance that is almost straight and with filled stitch holes.

THE INFLUENCE OF THE LEATHER ON THE SEAM APPEARANCE

Lengthways and across the grain, leather has a different structure. The hair follicles and sweat glands, which run the length of the animal from head to tail, are the reason for the different seam appearances depending on the sewing direction.

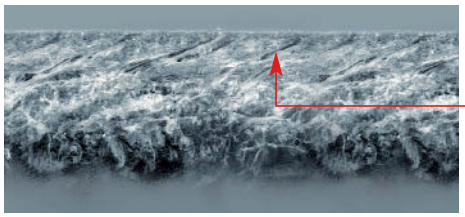


When using a needle with normal **cloth point (e. g. "R")** the stitch appearance will be different, and by what degree, depends on the sewing direction and properties of the leather.

In order to achieve a constant seam appearance in all directions, it is necessary to use a needle with a cutting point.

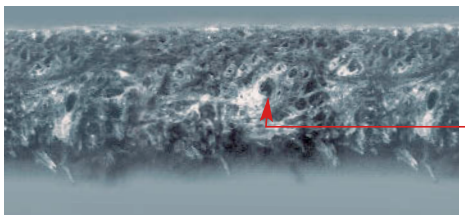
In case a straight stitch formation is desired in all sewing directions, the **S, LL, D or DH-cutting point** is recommended.

Where a seam with a slanted stitch formation is preferred, the use of **LR, VR or P-cutting point** is correct.



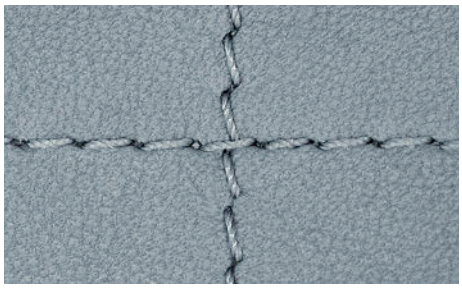
Section A-B

Hair follicles, sweat glands

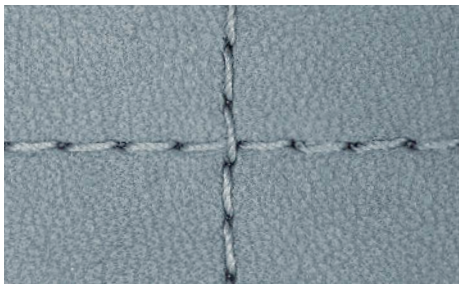


Section C-D

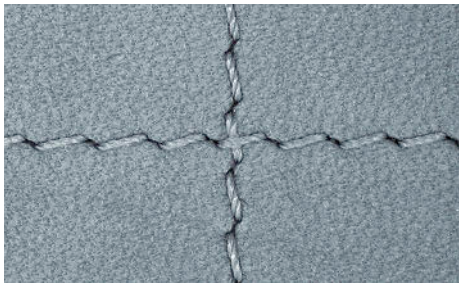
Hair follicles, sweat glands



Seam appearance R-point



Seam appearance LL-point



Seam appearance LR-point

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