

SEWING FOCUS

TECHNICAL SEWING INFORMATION

SERVICEHOUSE



Leather Wear

Checklist for Sewing Leather Wear

Sewing Parameters: SCHMETZ Tip:

| Needle size | NM | SIZE |
|-------------|---|--------|
| | 65 – 130 | 9 – 21 |
| | Depending on the thickness of the material. We recommend the use of the SCHMETZ SERV 7 needle. | |

Needle point For the production of leather wear, round points as well as cutting points are used with various types of incision.

Sewing thread For needle and hook/looper thread, mostly continuous multi filament made from 100 % polyester or 100 % polyamide are used. Less often, core spun threads are used.

Machine As a rule, industrial high-speed sewing machines (1 or 2 needle machines) with stitch type 301 are used. For decorative stitching, automatic multidirectional sewing machines are used.

Other factors:

Thread tension The necessary thread tension depends on fabric, thread and sewing machine. Thread tension should be as low as possible in order to enable optimal stitch formation.

Stitch type Double lockstitch (stitch type 301 and 304) according to DIN 61400.

Stitch density The higher the stitch density, the higher the strength of the seam.
But: max. 3 – 4 stitches/cm.

Quick Reference for Typical Sewing Problems in Leather Wear Manufacturing

| Symptoms | Effect | Cause |
|----------|--------|-------|
|----------|--------|-------|

Skip stitches/ Thread breakage

| | | |
|---|---|--|
| No interlacing/interlooping of needle thread and bobbin/looper thread | Sub-standard, defective seam appearance | Incorrect thread tension |
| | Thread breakage after skip stitch | Incorrect needle system |
| | Jamming of the sewing thread due to stitch holes which are stuck together | Needle incorrectly fitted |
| | | Needle deflection due to extremely thick layers of material at cross seams |
| | | Incorrect thread guidance |
| | | Mechanical damage to needle, throat plate, feed etc. |

Material damage

| | | |
|-----------------|--|---|
| Material damage | Reduced tensile strength of the material | Oversized needle and/or wrong point style |
| | Sub-standard, defective seam appearance | Defective/worn out needles |
| | Reduced seam strength | Incorrect feed |

| Solution | | | |
|--|--|---|---|
| NM SIZE | Point style | Thread | Machine |
|  |  |  |  |
| <p>Use the SCHMETZ SERV 7 needle</p> <p>Adjust needle size to the material and amount of layers and thread size</p> <p>Change needle regularly (after every shift or after a shorter interval depending on the stress)</p> <p>Check needle eye and groove for damage, if in doubt: change needle</p> | <p>Check point for damage</p> | <p>Adjust sewing thread size to the needle size</p> <p>Optimize thread tension</p> | <p>Optimize the hook/looper setting</p> <p>Adjust the sewing accessories, such as throat plate, feed etc. depending on material thickness and sewing thread/needle</p> <p>Examine the thread guiding elements</p> <p>Change worn out or defective sewing accessories regularly, such as thread guiding elements, hook/looper, throat plate etc.</p> |
| <p>Adjust needle size to the material and amount of layers: NM 80 – 120 in SERV 7-Version</p> | <p>SD1 Round point with small triangular tip</p> <p>LR Reverse twist point</p> <p>LBR Wide reverse twist point</p> | <p>Choose the right sewing thread size according to the needle size and the fabric</p> <p>Use core-spun threads</p> | <p>Adjust the sewing accessories, such as throat plate, feed etc. depending on material thickness and sewing thread/needle</p> <p>Check and adjust the material transport</p> |

Quick Reference for Typical Sewing Problems in Leather Wear Manufacturing

| Symptoms | Effect | Cause |
|---|---|--|
| Uneven seam appearance | | |
| Stitch sequence is irregular, resulting in a zig-zagging seam | <p>Reduced seam strength</p> <p>Sub-standard, defective seam appearance</p> | <p>Incorrect adjustment of the sewing accessories, such as hook/looper, feed etc.</p> <p>Incorrect balance of thread tension</p> <p>Incorrect thread guidance</p> <p>Needle deflection too heavy</p> <p>Damaged thread guiding elements</p> |
| Thermal damage | | |
| | <p>Individual layers of material are sticking together</p> <p>Needle thread breaks</p> <p>Needle eye is clogged</p> <p>Needle groove is clogged</p> | <p>Excessive needle temperature due to friction especially when sewing densely woven fabrics</p> <p>Excessive sewing speed</p> <p>Needle smeared or needle eye clogged with melted residue</p> <p>Melting of the thread surface and as a result mechanical breakage of the weakened thread</p> |

| Solution | | | |
|--|---|---|---|
| NM SIZE | Point style | Thread | Machine |
|  |  |  |  |

| | | |
|---|--|---|
| <p>Use the SCHMETZ SERV 7 needle</p> <p>Adjust needle size to the material and amount of layers</p> | <p>Optimize thread tension</p> <p>Check thread flow</p> <p>Choose the right sewing thread size according to the needle size and the fabric</p> | <p>Examine the thread guiding elements</p> <p>Check and adjust the material transport</p> |
|---|--|---|

| | | |
|---|--|---|
| <p>BLUKOLD needle with Teflon coating. This needle coating prevents or greatly reduces the adhesion of melted residues</p> <p>CAUTION: The use of the BLUKOLD needle does not reduce the needle temperature which is caused by excessive sewing speeds</p> | <p>Select a well finished sewing thread</p> <p>Alternatively use an extra thread lubricant (e.g. silicone oil)</p> | <p>Reduce sewing speed</p> <p>Use needle cooling through compressed air</p> |
|---|--|---|

Selection of Point Style and Needle Size

| Material | Number of layers | Needle size NM / SIZE | Point style |
|-------------------|------------------|-----------------------|---|
| Fine leather | 2 | 65 – 90 / 9 – 14 | SD1 round point with small triangular tip |
| | 4 and more | 90 – 100 / 14 – 16 | R normal round point |
| Medium leather | 2 | 90 – 100 / 14 – 16 | SD1 round point with small triangular tip |
| | 4 and more | 100 – 110 / 16 – 18 | LR reverse twist point |
| Thick leather | 2 | 110 – 120 / 18 – 19 | SD1 round point with small triangular tip |
| | 4 and more | 120 – 130 / 19 – 21 | LR reverse twist point |
| | | | LBR wide reverse twist point |
| Imitation leather | 2 | 80 – 90 / 12 – 14 | R normal round point |
| | 4 | 90 – 100 / 14 – 16 | SD1 round point with small triangular tip |

General recommendation:

Use of the SERV 7 needle version with appropriate point style



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1. Manufacturing of leather wear

Leather is tanned animal skin. It stretches, it has great tensile strength and is breathable. These natural characteristics are safeguarded using various processes of refinement.

Leather has many faces. The wide range of leather wear can be divided into elegant leather outerwear (jackets, trousers, blouses etc.), traditional costumes, riding and sports wear as well as motor cycle wear.

Leather wear must not only meet fashion and comfort criteria, it also has to satisfy such functional and safety aspects as abrasion resistance, tensile strength and elasticity.

Consistent quality of the end product is the decisive criterion for an optimal market position and for steady and growing success. Safeguarding quality from the initial step in the process of manufacture is crucial, and the key to end product quality.

If the needle is ignored during preparation, later manufacturing steps will cause irreparable damage to the material. Unfortunately, it is often discovered too late in the production process that the wrong needle was used. With the right needle, and more importantly with the right point style, this can be avoided.

1.1 Typical sewing problems

The sewing of leather is often a rather delicate matter and demands special sewing requirements. Depending on the type of leather or combination of materials, sewing parameters (such as thread and needle) that are not coordinated can lead to various sewing problems.

Typical sewing problems in the production of leather wear are:

- Seam perforation /Material damage
- Clogging of the needle/Thermal damage
- Skip stitches/Thread breakage
- Damage to the upper surface

1.2 Quality seams with the right sewing parameters

Not all leathers are the same. Therefore, all sewing parameters that influence production must be carefully coordinated: fabric, needle, thread and machine. Quality seams can not only meet the demands of durability and tensile strength, they can also comply with designers' fashion trends.

Needle

2. Selection of the right needle

When sewing leather, choosing the right needle is of particular importance.

All types of leather must be sewn with a cutting point. The relevant cutting profile and needle size together with thread and stitch density determine the appearance of the seam. Choosing the right needle depends on the thickness of the fabric and the number of layers.

2.1 Needle size

Before choosing the point style, the size of the needle should be fixed. It is important to find the matching sewing thread: The size of needle eye and thread size must be carefully matched so that the thread can pass through the needle eye with as little friction as possible.

The choice of needle size is dependent on fabric, number of layers, thread and finish. No damage can be expected when using the right needle diameter and matching needle eye.

| Thread size | Fine leather | | Medium to heavy leather | |
|-------------|----------------|------------------|-------------------------|------------------|
| | Needle size NM | Needle size SIZE | Needle size NM | Needle size SIZE |
| 80 | 65 – 75 | 9 – 11 | 70 – 80 | 10 – 12 |
| 60 | 80 – 90 | 12 – 14 | 90 – 100 | 14 – 16 |
| 40 | 90 – 100 | 14 – 16 | 100 – 110 | 16 – 18 |
| 30 | 110 – 120 | 18 – 19 | 120 – 130 | 19 – 21 |
| 35 | 110 – 120 | 18 – 19 | 120 – 130 | 19 – 21 |
| 20 | 120 – 130 | 19 – 21 | 130 – 140 | 21 – 22 |
| 25 | 130 – 140 | 21 – 22 | 140 – 160 | 22 – 23 |
| 15 | 130 – 140 | 21 – 22 | 140 – 160 | 22 – 23 |
| 10 | 140 – 160 | 22 – 23 | 160 – 180 | 23 – 24 |
| 8 | 160 – 170 | 23 – 24 | 180 – 200 | 24 – 25 |

2.2 Point style

The needles for sewing leather have a cutting edge. These special needles penetrate the fabric more easily due to their ability to cut. If one chooses the right point style in combination with the appropriate stitch length, the leather's loss of strength due to cutting is negligible.

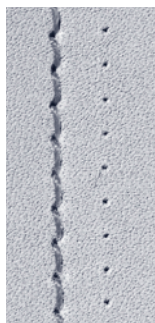
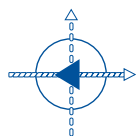
The choice of the appropriate cutting point depends on the thickness of the leather, type of seam, seam function and the desired seam appearance (e.g. decorative seam).

Stitch hole and seam appearance vary depending on whether the tip's cross-section is lens-shaped, diamond-shaped or triangular. It also matters whether it is transverse, diagonal or in the direction of the seam.

R normal round point



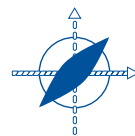
The normal round point "R" with its pointed conical shape is the standard point style and has many applications. It produces a straight seam. When sewing material combinations, the selection of point style is often a matter of compromise. Thus, the "R" point is used most often. Another area of use is the sewing of firmer leather, which can easily be penetrated using the normal round point.



SD1 round point with small triangular tip



Round point with very small triangular incision. The small triangular tip cuts around 10 % of the stitch hole, 90 % are displaced by the conical point. The result is a seam with an even appearance. Due to the small incision, this point is used for fine leather wear and for material combinations (such as fine leather with lining). Compared with the normal round point, “R”, the needle with a “SD1” point is deflected less and cuts the fabric beautifully.



LBR wide reverse twist point



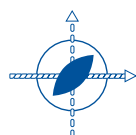
Cutting point with lens-shaped incision. The incision takes place at an angle of 45° to the direction of the seam and beyond the blade diameter. This needle produces a left-inclined, embossed and accentuated decorative seam. The use of coarse thread results in very beautiful decorative seams.

2.3 SERV 7 needle construction

Different sewing demands and material thicknesses require a needle which produces trouble free high quality seams.

Besides material damage skip stitches are a common problem. Skip stitches are produced if the loop of the needle thread which is formed during stitch formation is not caught by the hook point interrupting the interlacing of needle thread and bobbin thread. Skip stitches are influencing the direction and the strength of the seam and thus significantly the quality of the final product.

SERV 7 is a special needle to prevent skip stitches and needle breakages. This needle type comes in different point styles – meeting the various claims of the materials to be sewn. The distinctive features of SERV 7 needles are their specially shaped hump scarf and their extra blade reinforcement. The hump scarf extends the loop so that the hook or looper can catch it easily. This greatly reduces skip stitches. The outstanding stability of the SERV 7 needle especially pays when it comes to sewing multiple layers and firm materials.



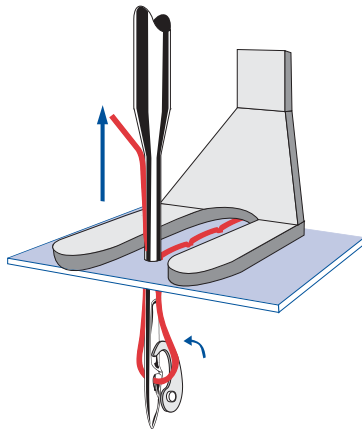
LR reverse twist point



Cutting point with lens-shaped incision. Incision takes place at angle of 45° to the direction of the seam. The needle produces a decorative seam slightly diagonal to the left.

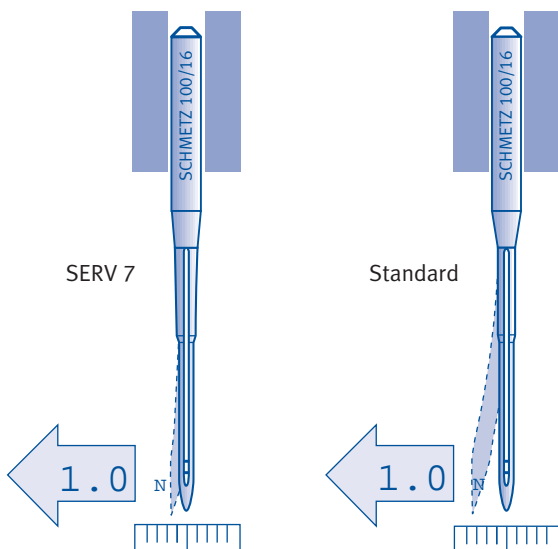
SCHMETZ Tip:
Benefit 1: SERV 7 hump scarf produces optimum loop formation and prevents skip stitches.

SCHMETZ SERV 7



The SERV 7 blade reinforcement makes the needle especially stable and far less likely to “bend”. Needle breakages are thus minimized and the precise penetration produces a better seam appearance. The low deflection of the needle also prevents skip stitches.

SCHMETZ Tip:
Benefit 2: SERV 7 needle has higher stability increasing needle life.



2.4 Changing of the needle

Damages of the needle as well as needle tip wear and tear impair the quality of the end product. Depending on the number of fabric layers, material thickness and combination, the needle should be changed at the beginning of every shift or at least once per working day. Changing the needle regularly enables consistently high sewing quality.

Sewing thread

3. Selection of sewing thread and stitch parameters

For sewing leather wear, mainly 100 % polyester or 100 % polyamide continuous multi filament threads are used. Synthetic sewing threads meet high demands due to their tensile strength, their elasticity and their abrasion resistance in the case of exposed seams. Efficient core spun threads made from 100 % polyester or 100 % polyamide with cotton cover also meet the requirements for sewing leather.

Sewing material and quality of sewing thread to a large degree determine the quality of the seam.

For decorative seams, smooth, silk-like glossy threads should be used, for country-style closing seams coarser threads are used. Especially in the case of strong decorative seams it is important that the strength of the bobbin thread does not deviate significantly from the strength of the needle thread. If the bobbin thread is too fine it can be pulled to the upper side and may break.

3.1 Composition and size of the sewing thread

Continuous filament

| Stitching technique | Polyamid 6.6 (Nylon) | | | | Polyester | | | |
|----------------------------|----------------------|---------|-------------|---------|-----------|---------|-------------|---------|
| | Yarn size | | Needle size | | Yarn size | | Needle size | |
| | No* | tex* | NM | SIZE | No* | tex* | NM | SIZE |
| Coarse decorative seams | 4 | 750 | 280 – 330 | 28 – 30 | 4 | 750 | 250 – 300 | 27 – 29 |
| | 5 | 600 | 250 – 300 | 27 – 29 | 5 | 600 | 250 – 280 | 27 – 28 |
| | | | | | 6 | 500 | 230 – 250 | 26 – 27 |
| | 7 | 429 | 230 – 250 | 26 – 27 | 7 | 429 | 200 – 230 | 25 – 26 |
| | 8/9 | 375/333 | 200 – 250 | 25 – 27 | 8/9 | 375/333 | 180 – 200 | 24 – 25 |
| | 10/11 | 300/273 | 160 – 230 | 23 – 26 | 10/11 | 300/273 | 140 – 180 | 22 – 24 |
| | 12 | 250 | 160 – 230 | 23 – 26 | 12 | 250 | 140 – 180 | 22 – 24 |
| Coarse seams | 13 | 231 | 160 – 200 | 23 – 25 | 13/14 | 231/214 | 130 – 160 | 21 – 23 |
| | 15 | 200 | 160 – 180 | 23 – 24 | 15 | 200 | 125 – 140 | 20 – 22 |
| | | | | | 18 | 167 | 120 – 130 | 19 – 21 |
| | 20 | 150 | 120 – 160 | 19 – 23 | 20 | 150 | 110 – 130 | 18 – 21 |
| | | | | | 24/25 | 125/120 | 100 – 110 | 16 – 18 |
| | 30 | 100 | 100 – 140 | 16 – 22 | 30 | 100 | 100 – 110 | 16 – 18 |
| | | | | | 35/36 | 86/83 | 110 – 120 | 18 – 19 |
| Medium seams | 40 | 75 | 100 – 120 | 16 – 19 | 40 | 75 | 100 – 110 | 16 – 18 |
| | | | | | 50 | 60 | 90 – 100 | 14 – 16 |
| | 60 | 50 | 80 – 100 | 12 – 16 | 60 | 50 | 80 – 90 | 12 – 14 |
| | | | | | 70 | 43 | 75 – 80 | 11 – 12 |
| | 80-90 | 38/33 | 70 – 90 | 10 – 14 | 80/90 | 38/33 | 70 – 80 | 10 – 12 |
| Stay seams (heel seams) | 40 | 75 | 100 – 120 | 16 – 19 | 40 | 75 | 100 – 110 | 16 – 18 |
| | 60 | 50 | 80 – 100 | 12 – 16 | 60 | 50 | 80 – 90 | 12 – 14 |
| | 80/90 | 38/33 | 70 – 90 | 10 – 14 | 80/90 | 38/33 | 70 – 80 | 10 – 12 |
| | | | | | 100 | 30 | 65 – 70 | 9 – 10 |

* No = Label number

* tex = Unit of size 1 g/1000 m (e.g. 75 tex = 1000 m yarn weigh 75 g)

Core Spun

| Stitching technique | Polyester/Cotton | | | | Polyester/Polyester | | | |
|-------------------------|------------------|-------|-------------|---------|---------------------|-------|-------------|---------|
| | Yarn size | | Needle size | | Yarn size | | Needle size | |
| | No* | tex* | NM | SIZE | No* | tex* | NM | SIZE |
| Coarse decorative seams | 4 | 750 | 230 – 280 | 26 – 28 | | | | |
| | 5 | 600 | 180 – 250 | 24 – 27 | | | | |
| | 6 | 500 | 180 – 200 | 24 – 25 | | | | |
| | 8 | 375 | 180 – 200 | 24 – 25 | 8 | 375 | 160 – 200 | 23 – 25 |
| | 12 | 250 | 160 – 180 | 23 – 24 | 12 | 250 | 140 – 180 | 22 – 24 |
| Coarse seams | 15 | 200 | 140 – 160 | 22 – 23 | | | | |
| | 20 | 150 | 140 – 160 | 22 – 23 | 20 | 150 | 120 – 160 | 19 – 23 |
| | 24 | 125 | 130 – 160 | 21 – 23 | | | | |
| | 25 | 120 | 120 – 140 | 19 – 22 | 25 | 120 | 110 – 140 | 18 – 22 |
| | 28 | 107 | 120 – 140 | 19 – 22 | | | | |
| | 30 | 100 | 120 – 140 | 19 – 22 | 30 | 100 | 110 – 130 | 18 – 21 |
| | 35/36 | 86/83 | 110 – 130 | 18 – 21 | 35/36 | 86/83 | 100 – 120 | 16 – 19 |
| Medium seams | 40 | 75 | 100 – 120 | 16 – 19 | 40 | 75 | 100 – 110 | 16 – 18 |
| | 50 | 60 | 100 – 110 | 16 – 18 | 50 | 60 | 90 – 100 | 14 – 16 |
| | 60/75 | 50/40 | 90 – 100 | 14 – 16 | 60/75 | 50/40 | 90 – 100 | 14 – 16 |
| | 80 | 38 | 90 – 100 | 14 – 16 | 80 | 38 | 80 – 90 | 12 – 14 |
| | 90 | 33 | 80 – 90 | 12 – 14 | | | | |
| | 100 | 30 | 80 – 90 | 12 – 14 | 100 | 30 | 70 – 90 | 10 – 14 |
| Stay seams (heel seams) | 40 | 75 | 100 – 120 | 16 – 19 | 40 | 75 | 100 – 110 | 16 – 18 |
| | 60/75 | 50/40 | 90 – 100 | 14 – 16 | 60/75 | 50/40 | 90 – 100 | 14 – 16 |
| | 80 | 38 | 90 – 100 | 14 – 16 | 80 | 38 | 80 – 90 | 12 – 14 |

* No = Label number

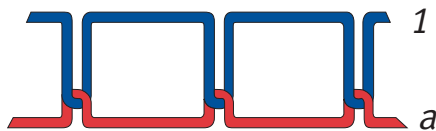
* tex = Unit of size 1 g/1000 m (e.g. 75 tex = 1000 m yarn weigh 75 g)

3.2 Stitch type

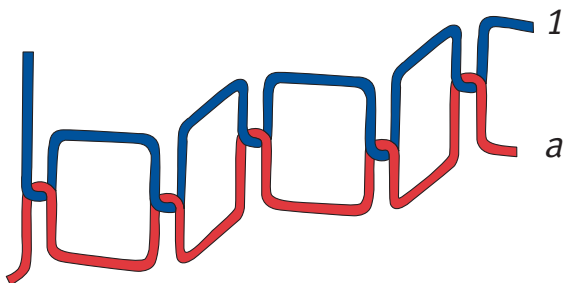
When sewing leather wear, the double lockstitch (stitch type 301) is used most often.

When sewing hard and brittle materials, stitch formation of needle and bobbin thread in the middle of the sewing good is very unlikely due to the low elasticity of the material. Stitch formation is therefore often on the material's underside (see stitch type 301). Although this makes sewing easier, it can cause the finished product's bobbin thread to break more easily if there is a lot of strain on the seam.

Stitch type 301 – double lockstitch interlaced at the underside of the sewing good



Stitch type 304 – double lockstitch zig-zag for decorative stitching



3.3 Stitch density

When sewing leather, stitch density should be kept as high as possible in order to increase transverse tensile strength and lengthwise elasticity of the seam. It should not be too dense on the other hand or the leather will be perforated. In order to keep a high stitch density a needle with an appropriate cutting direction must be selected.

Depending on thread size and the size of the incision hole, stitch density should be not more than 3 – 4 stitches/cm. Stitch density should also be adjusted to number of layers, strength of the material and the desired strength of the seam.

3.4 Thread tension

Optimal thread tension is a prerequisite for the right thread distribution and sufficient thread in the seam.

The required thread tension depends on fabric, sewing thread and sewing machine.

Machine

4. Sewing machines for the manufacturing of leather wear

For sewing leather wear, mainly heavy 1- or 2-needle double lockstitch machines are used. Additional accessories (such as folders) and special presser feet (e.g. Teflon, wheel or roller feet) make sewing easier.



Flatbed Sewing Machine Closing and topstitching seams



Free-Arm Sewing Machine Three-dimensional sewing operations, closing seams on curves

Sewing Automates

(without illustration)

For topstitching (decorative seams) more and more automatic machinery is used which is programmable for multi-directional sewing

4.1 Feed

To ensure uniform material feed there are various forms of machine accessories and feeds.



Compound feed with alternating presser foot top feed

For sewing heavy or feed-critical leather

4.2 Throat plate/Throat plate aperture size

All machines are fitted with specific sewing accessories for the particular use or sewing operation for which they are intended. This includes the machine's feed as well as the throat plate aperture, which matches the needle size that can be used.

Attention must be paid that the throat plate aperture is not too big for the needle size. This could result in the material being pulled into the throat plate, which in turn results in serious material damage and skip stitches. On the other hand, the thread must be able to pass through the aperture freely.

Needle size /Throat plate aperture size

| | | | | | | |
|---------------------------------|------|------|------|------|------|------|
| Needle size [NM] | 70 | 80 | 90 | 100 | 110 | 120 |
| Throat plate aperture size [mm] | 1.20 | 1.40 | 1.60 | 1.60 | 2.00 | 2.00 |

Relationship of needle size to throat plate aperture size

4.3 Sewing speed

The manufacturing of leather wear mostly involves medium sewing speed in order to produce a sufficient number of pieces (exceptions are e.g. decorative works). Especially long and straight seams can be produced effectively that way.

If sewing speed is exceeded while sewing previously glued parts of the leather, a glue residue can be left on the sewing needle due to heat impact.

5. Our advice

You can achieve damage-free quality seams if all the sewing parameters are precisely coordinated with one another.

Material, needle, thread and machine are the key variables. The **SCHMETZ SERVICEHOUSE** offers various service packages:

From recommending the ideal needle for your fabrics to sending out sample needles and providing assistance with special sewing requirements. In addition the **SCHMETZ SERVICEHOUSE** offers competent on-site advice on your production line and training courses for your employees.

**Challenge us –
let us show you our competence!**

Form to copy and fax: + 49 (0) 24 06 / 85-186

Do you have further questions about sewing leather wear?
Would you like support in solving your individual sewing problem?
Would you like recommendations on needle selection and sewability of your fabrics in advance of production?
Challenge the SERVICEHOUSE experts and take advantage of our offer.

We will be pleased to send you information on:

Our range of service:

CONSULTING

SAMPLE NEEDLES

Sample needles, tips and information

DOCUMENTED SEWING REPORTS

Sewing reports tailored to match your sewing goods as well as solutions for your complex sewing demands

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GUIDE TO SEWING TECHNIQUES

Manual for sewing industry

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TRAINING-ON-SITE

Industry specific training including the latest information on needles, threads, machines and applications

SYMPOSIUM

Interdisciplinary knowledge sharing and exchange of expertise for skilled sewing industry staff



| |
|---------------|
| |
| Company name |
| Attention |
| Position |
| Address |
| Postcode/City |
| Country |
| Phone |
| Fax |
| E-Mail |