

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
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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
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Uneven seam appearance

Stitch sequence is irregular, resulting in a zig-zagging seam	Reduced seam strength	Incorrect adjustment of the sewing accessories, such as hook/looper, feed etc.
	Sub-standard, defective seam appearance	Incorrect balance of thread tension
		Incorrect thread guidance
		Needle deflection too heavy
		Damaged thread guiding elements

Thermal damage

	Individual layers of material are sticking together	Excessive needle temperature due to friction especially when sewing densely woven fabrics
	Needle thread breaks	Excessive sewing speed
	Needle eye is clogged	Needle smeared or needle eye clogged with melted residue
	Needle groove is clogged	Melting of the thread surface and as a result mechanical breakage of the weakened thread

Solution

NM SIZE



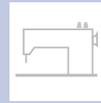
Point style



Thread



Machine



Use the SCHMETZ SERV 7 needle

Adjust needle size to the material and amount of layers

Optimize thread tension

Check thread flow

Choose the right sewing thread size according to the needle size and the fabric

Examine the thread guiding elements

Check and adjust the material transport

BLUKOLD needle with Teflon coating. This needle coating prevents or greatly reduces the adhesion of melted residues

CAUTION: The use of the BLUKOLD needle does not reduce the needle temperature which is caused by excessive sewing speeds

Select a well finished sewing thread

Alternatively use an extra thread lubricant (e.g. silicone oil)

Reduce sewing speed

Use needle cooling through compressed air

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.

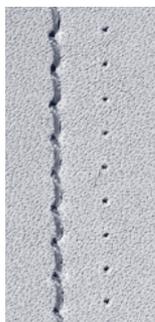
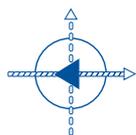
The choice of the appropriate cutting point depends on the thickness of the leather, type of seam, seam function and the desired seam appearance (e.g. decorative seam).

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



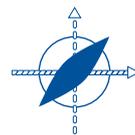
The normal round point "R" with its pointed conical shape is the standard point style and has many applications. It produces a straight seam. When sewing material combinations, the selection of point style is often a matter of compromise. Thus, the "R" point is used most often. Another area of use is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



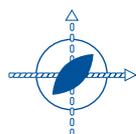
Cutting point with lens-shaped incision. The incision takes place at an angle of 45° to the direction of the seam and beyond the blade diameter. This needle produces a left-inclined, embossed and accentuated decorative seam. The use of coarse thread results in very beautiful decorative seams.

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

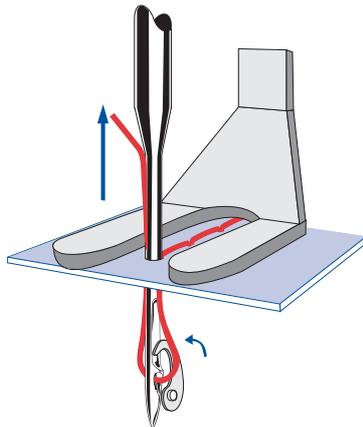


Cutting point with lens-shaped incision. Incision takes place at angle of 45° to the direction of the seam. The needle produces a decorative seam slightly diagonal to the left.

SCHMETZ Tip:

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

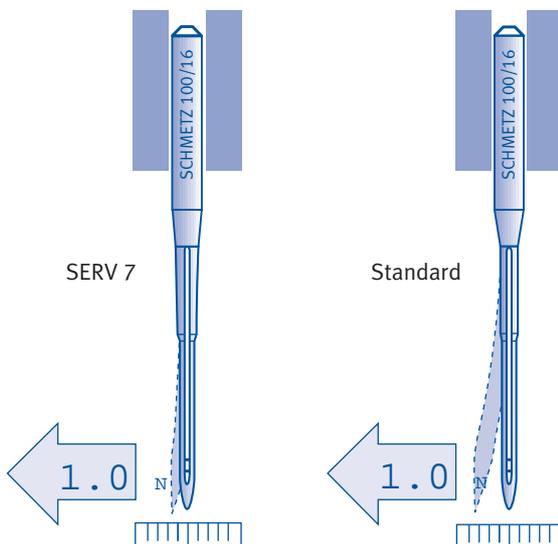
SCHMETZ SERV 7



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

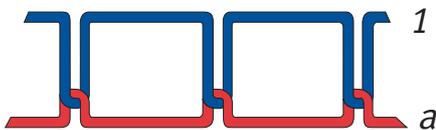
* tex = Unit of size 1 g/1000 m (e.g. 75 tex = 1000 m yarn weigh 75 g)

3.2 Stitch type

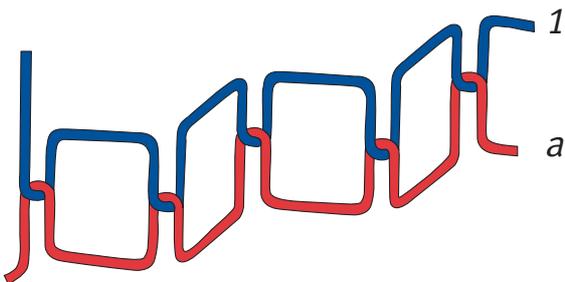
When sewing leather wear, the double lockstitch (stitch type 301) is used most often.

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

EXPRESS CONSULTING

Express consulting by phone, fax or e-mail

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Sewing information for special industries and applications

PRODUCT FOCUS

Product information for special industries and applications

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
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