

AMANN

Service + Technik

INFORMATION FOR THE SEWING INDUSTRY

SEWING ON BUTTONS SECURELY



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THE BUTTON – A FUNCTIONAL COMPONENT WITH TRADITION AND ALSO A FASHIONABLE ACCESSORY

No designer of overcoats, blazers, blouses or trousers would like to do without buttons as a means of fastening. Therefore the button continues to perform an important practical function on garments and many other textile goods. In addition it is used as an alternative to the zipper in many areas where garments need doing up.

Apart from this purely functional task, the button is of great importance as a fashionable accessory. In fact, quite often it is the most important fashion detail that reveals the true value of, for example, a model dress. And therefore much thought is put into button design. Season after season button designers create true works of art made of all kinds of material and in a large variety of shapes. Buttons made of natural materials, metal or plastic are eye-catching ornaments that do increase the value of a piece of garment. There are numerous examples for this; just think of coat dresses, blazers, or traditional dresses and suits. Sometimes buttons don't even have a practical use, they are merely applied for decorative purposes.

The more precious a button is the more annoying it is if it comes off or gets lost. A loss that unfortunately occurs too often. And if this is the case, one often needs to replace the entire button set because there is no spare button at hand. Whilst this loss is tolerated in case of a simple button on a pair of trousers it will very likely be the reason for a complaint with the manufacturer of that piece of garment in case of a more expensive, fancy button.

Such complaints cause a lot of extra work and costs for the garment manufacturer. To get rid of this problem well-known garment manufacturers, suppliers of accessories, and manufacturers of sewing machines started a co-operation named „Sicheres Knopfnähen“ („Sewing Buttons Securely“). Since the sewing thread is the link between the button and the material AMANN, too, has brought its decades of experience in the investigation of this fundamental sewing problem.

Not only the enterprises participating in this project are intended to benefit from the results of this project, but also the entire clothing industry. This brochure now includes the most important findings of this sewing technological investigation in a brief and clear form.

DESCRIPTION OF THE PRESENT SITUATION

How are buttons sewn on?

Various button sewing methods are applied on the production floor. But a basic distinction must be made between the mechanical or manual sewing on of buttons. Even today, no other sewing operation is done by hand as frequently as this one.

To sew buttons on mechanically, sewing machine manufacturers offer various methods. These differ primarily in:

- ▶ **the stitch type used**
- ▶ **the way the thread is cut after sewing**
- ▶ **whether the button stem is wrapped**

The stitch type used

Buttons are sewn on most frequently with the single-thread zig-zag chainstitch (stitch type 107). The zig-zag double lockstitch (stitch type 304) and the single-thread lockstitch (sewn either by hand or on a machine imitating a handstitched seam) are used less frequently.

No matter which type of stitch is applied, the formation of stitches in the button sewing cycle is impaired by the absence of a feed motion. It is only when circular tacks are sewn that the individual stitches are packed just as closely together and the threads interlock in an equally limited space.

The way the thread is cut after sewing

On most button sewing machines the thread is cut in a shearing action. A knife, either movably arranged below the throat plate or fitted to the sewing hook and making a return stroke after sewing, cuts off the sewing thread. On some types of button sewer the sewing thread is severed by raising the button clamp. The length of the thread tail depends on the thread cutting method applied.

When the shearing method is used, the length of the thread end is dependent on the thickness of the throat plate and consequently measures at least 3 mm. When the thread is severed by lifting the button clamp, however, it breaks right at the point where the last thread was knotted, so that its tail measures 1 mm at the most.

Button stem wrapping

Button stems are usually made only when two or four hole buttons are sewn to jackets and overcoats, or buttons are attached to sleeves having buttonholes. The stems of shirt and blouse buttons as well as shank and self-shank buttons are wrapped in exceptional cases only. Button stems are wrapped in order to attach the button more securely and to reinforce the stem. Buttons with a long stem must stand upright and must neither tilt over nor dangle loosely.

Button sizes and shapes

Button can be divided into three main groups as follows:

- ▶ shank buttons
- ▶ self-shank buttons
- ▶ two and four hole buttons

As the creativity of button designers knows no limits, each of these groups consists of a variety of buttons which additionally differ as follows:

- ▶ in size (ligne)
- ▶ in shape (round, oval, square, triangular)
- ▶ in the distance between holes
- ▶ in thickness
- ▶ in the way their reverse side is moulded (concave, convex or flat)

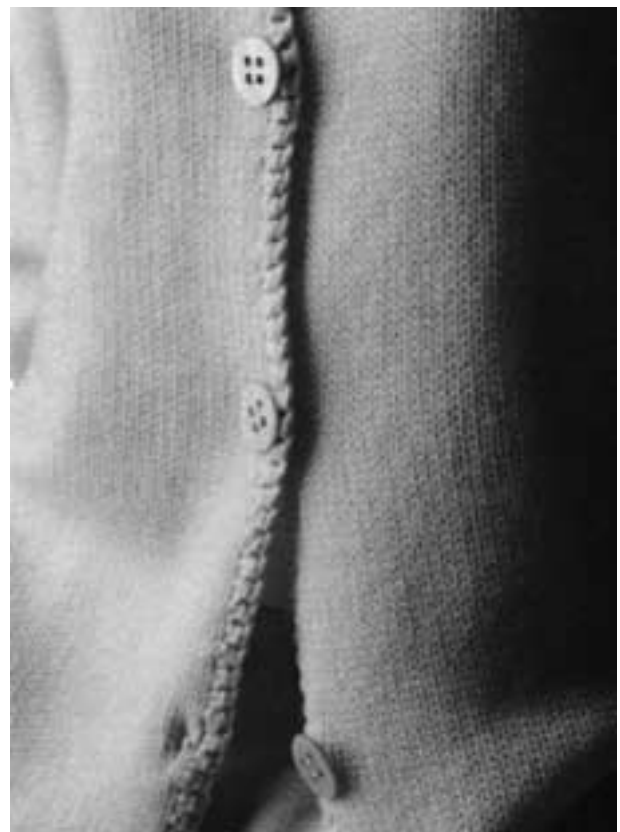


The button size is normally indicated by a British unit of measure called „ligne“ (Symbol ′′′). This measure indicates:

- ▶ the diameter of round buttons
- ▶ the distance between the farthest corners of multi-angular buttons

Based on the inch (= 25,4 mm) which equals 40 ligne, the following table can be used to convert button sizes from ligne into millimetre:

Ligne (′′′)	Millimetre (mm)
10 ′′′	6,35 mm
20 ′′′	12,70 mm
30 ′′′	19,05 mm
40 ′′′	25,40 mm
50 ′′′	31,75 mm
60 ′′′	38,10 mm



CAUSES FOR BUTTONS BECOMING LOOSE

What is the problem?

There are several reasons which may cause buttons to come off. These can be differentiated as follows:

1. SEWING BY HAND

causes occurring only when buttons are sewn on by hand

2. STITCH TYPE USED

causes occurring in conjunction with a specific type of stitch used (single-thread chainstitch, single-thread lockstitch or double lockstitch)

Single-thread chainstitch

It is common knowledge that a single-thread chainstitch seam can be easily pulled open if the last stitch comes undone. For this reason, the length of the thread tail is of special importance. In view of the fact that it is customary in clothing factories to limit this length to 1 mm, the last stitch is bound to come open at some time.

But even manufacturers of high-quality clothing have laid down exactly this thread tail length in their quality specifications. After all, they do not want a dangling thread end of 3 to 4 mm to spoil the appearance of a garment. For this reason, thread ends protruding from button seams are trimmed at final inspection at the latest. This throws some light on the following statement:

„The stricter the quality specifications applied in a sewing factory, the higher the probability that a button will come off.“

Apart from an extremely short thread end, improperly sewn tying stitches may also cause a button seam to come undone. If the last stitch has not been tightened securely, first the seam end and then the entire seam will unravel in use.



Double lockstitch

The lockstitch basically is more reliable for button sewing because the needle and bobbin threads are interlocked as each stitch is made. If the needle and bobbin threads are properly balanced, the seam cannot be pulled open from either end. With this type of stitch the number of buttons which come off or dangle loosely – annoying though this may be – are very small. They work loose because they were sewn on with too weak a thread tension or an insufficient number of stitches. The latter happens because the thread frequently is not drawn into the material from the very first stitch.

Although buttons sewn on by lockstitch button sewers are attached very reliably, these machines are a rare sight in sewing factories. The reasons for this are to be found in the appearance of the lockstitch seam and the insufficient flexibility of these machines in application. The main disadvantages are:

- ▶ large-diameter shank and self-shank buttons can be sewn on a lockstitch sewing machine only with great difficulty, if at all. The larger these buttons are, the more difficult it is to make sure the first stitches are set properly. In some cases, there is no other choice than to sew such buttons on by hand
- ▶ the lump produced by the threads interlocking on the underside of the fabric is greater with a lockstitch than a single-thread chainstitch seam. These thread accumulations may impair the appearance of the seam.

Single-thread lockstitch - handstitch

It is noted that buttons which are sewn on by hand are often not attached durably enough. By contrast, consistently good sewing results are obtained when buttons are sewn on with a single thread lockstitch machine. Generally speaking, manual button sewing is a reliable method, except that quality fluctuations occur because this job is often carried out irregularly. As a result, buttons may come off because they were sewn on with an insufficient number of stitches and/or the thread ends were not tied off properly. The percentage of buttons which are sewn on by hand is surprisingly large because there are buttons in numerous shapes and sizes that are unsuitable for machine sewing. And, furthermore, when garments are manufactured in low-wage countries the technical facilities available for button sewing are often not used because it may be cheaper to do the job by hand than to provide the necessary machines and equipment.

In spite of the good sewing results obtained with single-thread lockstitch machines, this stitch type has not gained general acceptance. Moreover, there are a number of disadvantages which limit its application:

- ▶ the acquisition costs of this type of machine are comparatively high.
- ▶ the machine speed is very slow
- ▶ for button sewing a special cut-to-length thread must be used which is expensive
- ▶ its use is limited because large-size buttons cannot be sewn on standard versions of the machine



3. MACHINE TYPE/SEWING METHOD

Causes occurring on all types of machine, no matter which button sewing method is applied.

The percentage of buttons which work loose or come off increases considerably on machines which are defective or adjusted improperly.

In view of the fact that there is a large variety of buttons today and garments are processed in extremely small lot sizes, button sewing machines have to be readjusted very frequently; in some cases several times a day. This adjustment is normally made by the operator herself, but usually she is not properly trained for this job. Working under pressure as she mostly does, she attempts to find the correct machine setting by making a number of trial runs, although a careful and accurate adjustment would be required every time. The inaccuracies resulting from this may cause the needle to be deflected when entering the material so that skipped stitches occur.

This, as the results of our investigations have shown, is a major cause of error which often is not given the attention it deserves.

Another reason why the correct machine setting must be given top priority is because the space available for stitch formation is extremely small. As the needle keeps entering the material at exactly the same point,

i.e. as it is more or less sewing on the spot, stitch formation becomes more difficult as the number of stitches increases.

As a result, an inaccurately adjusted machine may cause skipped stitches. When the space is extremely limited, e.g. because the number of stitches is too high or the needle and thread sizes are unsuitable, the needle may be deflected so that proper stitch formation is no longer ensured.

Further causes which may be responsible for buttons coming loose may, in rare cases, be found with the button itself. Thus, for instance:

- ▶ burrs at holes and eyelets will chafe the thread through after a short time
- ▶ irregular spacings between holes may cause needle deflection and, as a result, skipped stitches

However, in view of the sophisticated manufacturing techniques applied by quality-conscious button producers these days, such deficiencies occur only in exceptional cases.

All other causes vary with the type of stitch used and the different manual and mechanical sewing methods applied.

REMEDIES

How can the problem be solved?

Every clothing manufacturer can reduce the problem considerably by making a clear analysis and systematically eliminating all weak spots discovered. The causes which have come to light clearly show that apparel manufacturers can obtain sufficiently durable button seams by availing themselves of the technical possibilities at their disposal.

Every clothing manufacturer should examine the production conditions in his own factory to find out which of the causes described above apply. The check list reproduced below contains all criteria to be examined and clearly shows the corrective action to be taken.



CHECK LIST FOR MAKING BUTTON SEAMS MORE DURABLE

STITCH-TYPE	SINGLE-THREAD CHAINSTITCH	DOUBLE LOCKSTITCH	SINGLE-THREAD LOCKSTITCH MECHANICAL	SINGLE-THREAD LOCKSTITCH MANUAL
CAUSES WHY BUTTONS COME OFF	Last stitch not tightened securely enough	Specified number of stitches insufficient	Insufficient number of stitches	Insufficient number of stitches
	Thread end too short ($\leq 3\text{mm}$)	Skipped stitches at beginning of seam		
TEST TO OVERCOME DIFFICULTIES	Skipped stitches	First stitches not set tightly		Thread ends not tied off properly
				Differences in quality of sewing
	Inaccurate machine setting			
	Defective machines employed			
	Thread tension too low			
	Improper needle and sewing thread used			
	Needle and thread sizes unsuitable for material being sewn			
	Tie-off stitches injured when thread ends are trimmed by hand			
	Has machine been adjusted correctly so that last stitch will be tightened securely?	Has a sufficient number of stitches been chosen?	Has a sufficient number of stitches been chosen?	Are quality specifications describing most important production parameters such as number of stitches and tie-off mode, available to personnel?
	Is the tail at least 3 mm long?	Has machine been adjusted properly to ensure reliable setting of stitches?		
	Do skipped stitches occur?	Do skipped stitches occur?		Is strict compliance with quality specifications ensured by regular checks?
	Has proper machine setting been ensured even if button styles change frequently?			
	Are all machines in good condition?			
	Has thread tension been set correctly to ensure button will be sewn on firmly?			
	Is correct sewing thread used?			
	Have needle and thread sizes been adapted to material being sewn?			
	Are mechanics and machine operators to readjust machines properly?			
	Are thread ends trimmed with maximum care to ensure that seams will not be injured?			
	Are button stems wrapped carefully?			
	Do all buttons have wrapped stems?			

SEWING THREAD RECOMMENDATIONS

All the corrective measures presented herein will be successful only if a suitable sewing thread is used. We therefore recommend our core-spun threads SABAC^C and Rasant.

With these threads AMANN offers the sewing industry a product that is perfectly suited for all sewing operations and that will make button sewing a „sure thing“.

The selection of the right thread size from the SABAC^C and Rasant range is determined by the following criteria:

- ▶ What stress does the button have to withstand in wear? It is obvious that buttons serving a decorative rather than a practical purpose can be sewn on with a thinner thread than buttons used for fastening trousers or jackets, for example.
- ▶ What will it be used for? Depending on the material, the model, and the product range (women's, men's, or children's wear) the suitable sewing thread size is determined.
- ▶ Which article and/or which ticket no. is used for the other seams on this piece of garment? In favour of a small sewing thread assortment it should be avoided to add another article just to sew on the buttons.

From our product range we especially recommend the following ticket numbers for button sewing:

SABAC ^C 80	RASANT 75
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SABAC ^C 100	RASANT 100
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SABAC ^C 120	RASANT 120
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NEEDLE RECOMMENDATIONS

A prerequisite for trouble-free sewing is the optimum correlation between needle, sewing thread and material. We recommend using the following combinations of needle and thread sizes:

SABAC ^C 80/RASANT 75	Needle size	100
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SABAC ^C 100/RASANT 100	Needle size	90
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SABAC ^C 120/RASANT 120	Needle size	80 or 90
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Since a small force suffices to deflect the needle during stitch formation, thin needles (No. 70 and finer) and short-shank needles should only be used in exceptional cases. The needle point must be selected to suit the material to be sewn. „R“-point needles, as a rule, are well suited for all standard fabrics. However, to make sure the needle will sew properly at all times, it must be checked frequently and replaced at regular intervals.

SUMMARY

It will certainly be worthwhile for all clothing manufacturers to study the problems presented here very thoroughly. Even though the actual rate of defects is unknown, it is safe to say that particularly the loss caused to manufacturers of highgrade garments may be considerable. And this for the following reasons:

- ▶ High costs for handling complaints: wages, material and delivery costs of €10 and more per complaint are not unusual.
- ▶ Customers, particularly those who have bought high quality garments, simply do not understand why the workmanship is so poor that buttons come off. The resultant loss in reputation is hard to assess and cannot be expressed in accurate figures.

If the corrective measures described in this brochure are implemented the percentage of poorly sewn-on buttons can be reduced to less than 1%. Without doubt this is a step in the right direction which will cut the number of complaints down to a tolerable level.

SEWING TECHNIQUES SERVICE HOTLINE:

We will be glad to support you in all issues regarding sewing techniques. Feel free to contact us under:

phone +49 (71 43) 277-250

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