Using the right molecules to cope with seams and fabrics that stretch

Garment assembly techniques used to be so simple. Just cut and sew. Thread was thread. Then customers became more demanding, comfort became the main concern, and, because body shapes are so individual, stretch came into the equation. Generous seams with a little give were not enough, expanding waistbands were not the complete answer.

Fibres and fabrics with stretch followed thick and fast. And, once stretch was commonplace, assembly systems had to be rethought. New concepts, taped seams, stretch tapes and welding have been introduced which have even removed the need to sew. Not surprisingly, the thread manufacturers have also responded to the challenge, especially from the active sportswear market.

With elastic clothing the material and the seam do not necessarily have the same degree of stretch. Discomfort when dressing and in wear, annoyance about product quality and finally complaints about unsightly pulled seams are everyday occurrences in the retail trade.

Conventional sewing yarns do not provide enough give with a 12% to 20% level of elasticity. The logical solution would be a highly elastic sewing thread that guarantees the elasticity of the seam. With the SabaFlex product range Amann & Söhne GmbH & Co. KG, Bönnigheim (Germany) has had a solution on the market since the IMB 2003 that has already shown its practicality.

Who's not discovered seams overstretched along the direction of the seam with the immediate result of the appearance of pulled seams? The seams rip - as a rule announcing themselves with a clearly audible tearing sound. With elastic sportswear such as shirts, jumpers and trousers, swimwear and casual wear, this problem is all too familiar from complaints statistics. If you carry out a test on a sample and check the elasticity of finished products along the seams e.g. with a simple manual test, you will find that many seams do not achieve the level of elasticity required by the material.

These quality defects are often not noticed until the first time that you put the article on and thereby stretch the seams or when you are wearing it and this can then lead to complaints, or at least, irritation with the product quality. Experience shows that the seams on the neck, arm and leg pieces are particularly affected.



The Cameroon's football strip provides all the freedom of movement a player should want and the stretch threads make conventional construction possible.

Amann & Söhne

Stitching parameters for seam elasticity

The avoidance of this problem was previously only possible by the use of suitable ways of stitching. Establishing the right density and type of stitch and checking the tension of the threads was and is of special importance here. The key to ensuring high seam elasticity is in the reserves of thread, or the quantity of thread in the seam.

The more thread there is in the seam, the higher the elasticity of the seam. Type and density of stitch directly affect the thread requirement and hence can ensure relatively high elasticity of the seam. Highly elastic cycling wear and underwear are positive examples that this can work. The skilled use of appropriate stitching parameters is able to provide a sufficient level of seam elasticity. However, as evidenced by the many complaints and tests in the trade, carrying out the required manufacturing instructions with elastic materials is difficult. Sometimes mistakes in production reduce seam elasticity to an unacceptable level, with incorrect thread tension or too low density of stitch being especially seen as known weaknesses. In addition, the stitching parameters required for adequate elasticity cannot always be achieved because of the design. So oversewn chain stitches are not always suitable for seams in all positions and a stitch density of six stitches/cm is not necessarily appropriate for every material.

Elasticity in the molecules

The interest in an elastic sewing thread that solves all the problems described is therefore not surprising. There is probably hardly a single technician to whom this thought has not already occurred if he has been involved in ensuring adequate seam elasticity. An elastic sewing yarn would make possible almost any desired level of elasticity in a simple way. The required effort of selecting and maintaining suitable stitching methods would be significantly reduced. Although this idea seems simple, it is difficult to implement. Until now you would have looked in vain for a highly elastic sewing thread among the sewing thread suppliers' ranges.

This innovation did not appear until the IMB 2003. Amann presented a highly elastic sewing thread under the name of SabaFlex, with the ability to stretch by about 70%. (For comparison, stretch levels of conventional sewing threads are in the range of about 12% to 20%.) SabaFlex is a multifilament twine made of PTT (polytrimethylenterephtalate) whose elasticity depends on its molecular structure rather than mechanical changes (e.g. texturing).

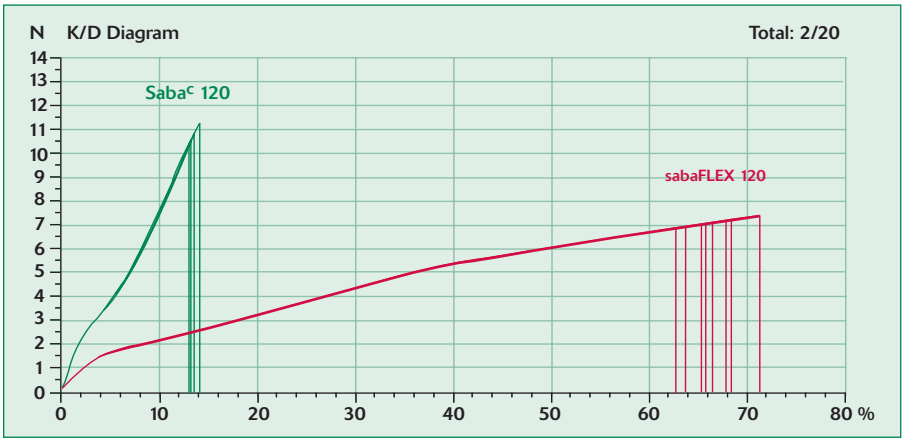


Diagram shows thread elasticity at breaking point. A traditional thread such as Saba C120 needs a force of about 11N before it snaps, but elongation is approximately 14%. Whilst sabaFLEX needs a force of only some 7N for it to break, the elasticised thread at that point is elongated by between 60-70%. Seam strength, however, is essentially the same for the two, as tearing of the seam would have to exceed the point of elasticity.

Being adapted to the demands of stretch clothing, it is supplied in strengths of Nos. 80 and 120 in a 2000m or 3000m unit. At the moment there is a range of 40 colours.

Irrespective of the stitch type, the use of SabaFlex ensures a marked increase in seam elasticity. With double lock stitch, for instance, twice the seam elasticity is achieved. So the double lock stitch, which was previously on the 'red list' for processing elastic materials because of its low quantity of thread, can once again be employed in finishing. Cover stitch seams, which are already elastic because of the high quantity of thread, achieve an additional reserve of elasticity with the highly elastic sewing thread. The result is a stronger product e.g. in swimwear.

Reactions at the IMB and also in the first test runs in the following weeks and months were encouragingly positive. The idea of the reserve of elasticity thanks to the sewing thread was gratefully seized on principally by sportswear manufacturers in order to improve product quality. Today, SabaFlex is recommended and hence specified by various manufacturers for the processing of elastic materials. The use of the new thread is handled in a wide variety of ways. In some cases the yarn will only be used for critical seam positions e.g. on the neck piece, while in other cases firms will have considered complete reworking. As a rule, in all cover stitch positions, only the needle thread is provided with the highly elastic sewing thread whilst the loopier thread and possibly the plaiting thread continue to be provided with conventional threads, in this instance, usually with texturised bulk yarn. Since the needle thread is the weakest and shortest link in all cover stitch seams, this kind of thread provision makes particular sense. It guarantees both softness and seam elasticity.

A need to plan the use carefully

Irrespective of the specific application, the use of such a highly elastic sewing thread should be agreed with all technical staff and all those responsible for production. Based on experience, which materials, designs and seam positions generate the biggest problems of seam elasticity and require the use of an elastic sewing thread? The 'right' sewing thread concept does not have to look the same for every manufacturer of elastic clothing. Help with the introduction of this type of thread is provided by Amann's sewing technical service which has been able to gain broad experience in the processing of highly elastic sewing thread over recent months. The conversion of sewing machines to this flexible thread should be supervised by technicians in order to ensure a trouble-free changeover without problems in sewing. The high level of stretch of this special thread demands very low thread tension which must first be established and then adapted to SabaFlex during the changeover. There are also further special factors worth considering in order to ensure trouble-free sewing. If the introduction of the yarn is properly supervised, then experience shows that it can be integrated into production without problems. The results in the firms who are already using it, confirm that a highly elastic sewing thread can in fact work as a solution to the problems of processing elastic textiles and can also function as an elasticity reserve.