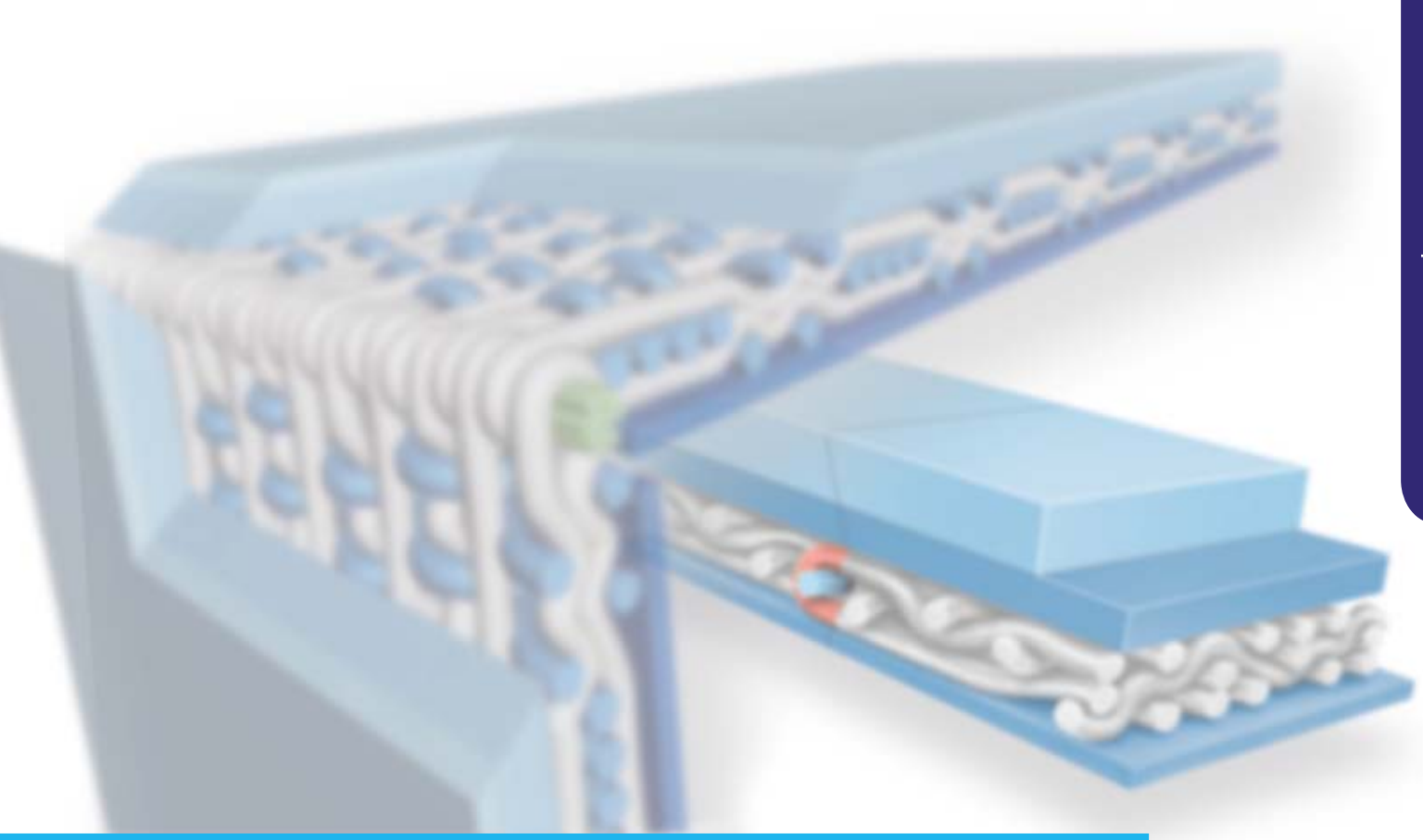

Press Release

Seamed felts – technical background

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Introduction

The optimisation of the paper making processes is one of the permanent duties of the paper maker. This can also include consideration of whether improvements in clothing the press section can be achieved with seamed felts. In addition to the well known safety benefits of seamed felts on felt installation, a significant economic advantage can be obtained from improved resource utilisation, such as time and personnel savings. Improvements can also be found in the fact that the specific performance characteristics of seamed felts allow for the more appropriate matching of the clothing to particular press sections or individual positions.

The decision criteria for the application of seamed felts are varied. With the current stage of development achieved by Heimbach seamed felts, the grade to be produced is no longer an argument against a changeover – perhaps with the exception of laminating papers or other highly sensitive grades. The decision to use seamed felts is in most cases not dependent on speed. The main characteristics of Heimbach seamed felts – runnability, extensibility/felt tension and particularly the execution of the seam and the seam area are suitable for all speeds. The final decision is based on a combination of the factors which make the installation of seamed felts not only possible but advisable.

In the following paper the technological background of seamed felts is considered in more depth. All relevant facts are taken into account – both those which are specific to seamed felts and also those with equal relevance to both seamed and endless press felts. One fact is clear: seamed felts are in the ascendancy – world wide.

1. Endless Felt / Seamed Felt – Differences

The decision to change over from endless to seamed felts is made much easier with Heimbach clothing. However, a few basic differences should be pointed out:

1.1 Behaviour of Structure

The woven base modules of CONNECT seamed felts from Heimbach are composed of monofilaments in both machine direction and cross direction (Fig. 1). This construction is both necessary and wanted, since the fine loops of the seam are formed from the monofilament MD yarns. Specifically selected CD monofilaments produce in the felt a high level

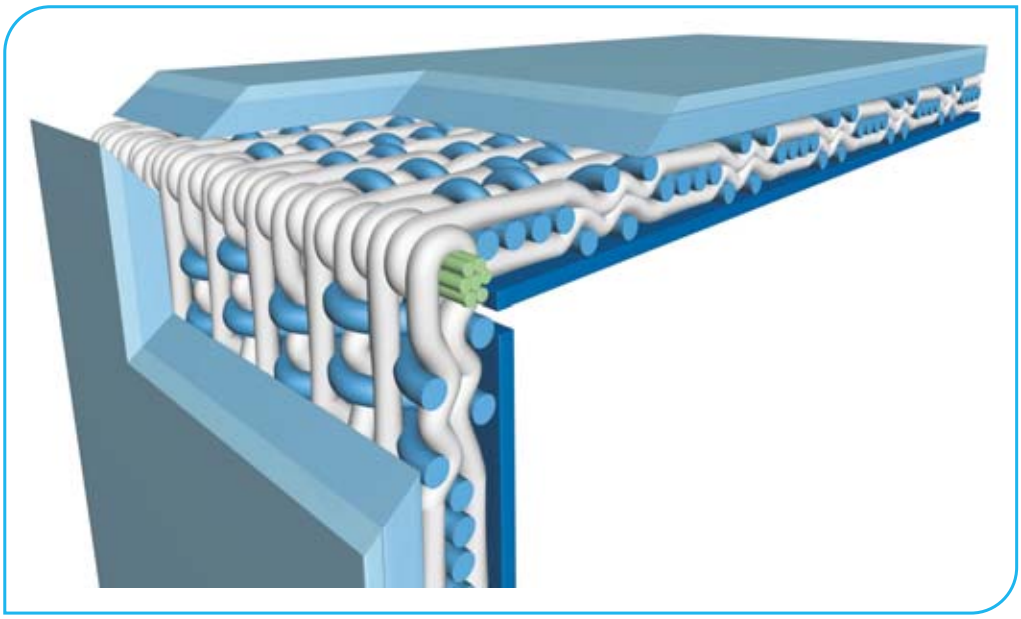

Fig. 1 CONNECT seamed felt from Heimbach

of CD stability. In combination the MD and CD monofilaments produce a more rigid, dimensionally and diagonally stable structure than is possible with an endless felt based on a plied yarn structure (Fig. 2). The seamed felt is installed at full width into the machine – like a dryer fabric. Therefore, as a pure monofilament structure the felt can be significantly "stiffer" – and as a result can have a higher incompressibility index. This gives it long life dewatering efficiency.

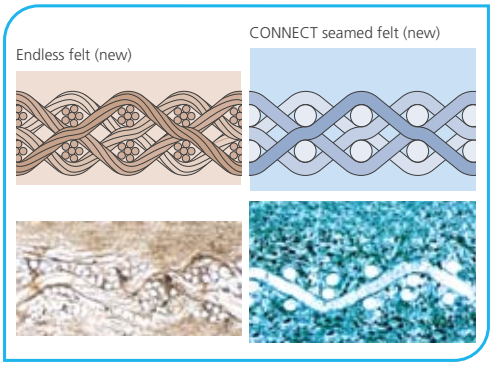

Fig. 2 Comparison: endless – CONNECT

1.2 Behaviour of Base Geometry

A further positive feature of the pure monofilament base is that its initial geometry is maintained for significantly longer under press load, since monofilaments are not as easily deformed. The base types of Heimbach seamed felts retained constant operating efficiency over a long period. Figure 3 shows on the right a CONNECT seamed felt after running for 42 days at 1300 m/min. The batt surface is visibly compacted and contaminated. The geometry of the base is however virtually unchanged. This is an obvious plus in the decision criteria in favour of seamed felts.

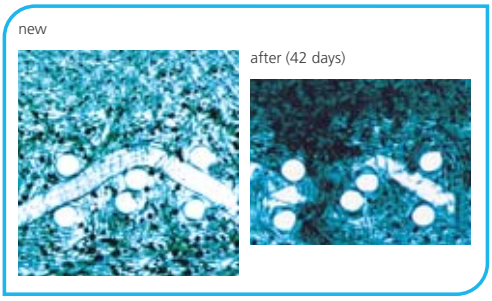

Fig. 3 Comparison:
Pore Volume CONNECT Seamed Felt

1.3 Seamed Felt Variations for Differing Dewatering Requirements

Nip dewatering or Uhle Box dewatering? The Heimbach seamed felt programme offers suitable felt types for both types of dewatering. ATROMAXX.CONNECT is exemplary in this context. The base consists of two monofilament modules, the "multi-axial" structure applied on top of the conven-tional one with the paper and roll side batts during the needling process. This felt has an exceptionally high working void volume. It is designed with a special batt surface for nip dewatering where very high water volumes have to be handled. In an appropriately modified form it can also, because of the high void volume, be made to carry the water to the Uhle Box.

The basic rule for seamed felts is the same as for endless felts: both should enter the press with an optimum level of saturation. Only fully saturated felts can dewater effectively.

1.4 Batt Surfaces, Batt Anchorage

The anchorage of the fibre batt is potentially more difficult with monofilament base weaves than with those made with plied yarns. For this reason Heimbach have developed a special needling technique for the anchorage of batt surfaces to monofilament bases. This is based on "mutuality", batts on both sides of the base being needled into one another. This is the reason why monofilament base weaves must always be equipped with a roll side batt. In this way the monofilament base of CONNECT is safely and firmly "packed" between the two batt surfaces.

This needling technique requires dense batt components on both sides in order to intensify the "mutual" anchorage. For the essential batt seam overlap and its long life ability to cover the seam this needling intensity provides an additional anchorage of a "self supporting" internal batt structure (Fig. 4). It ensures the density and survival of the batt seam throughout the felt life.

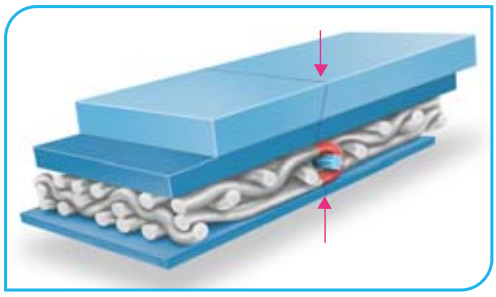

Fig. 4 CONNECT seamed felt: batt overlap

In addition to the advantages of a secure batt anchorage the two sided batt needling process provides the possibility of a comprehensive programme of specifically adjustable batt surfaces. In this way coarser resilient batts can be combined very fine surfaces. Batt layers with differing fibre finenesses and surfaces in flat fibres or MD layers (Fig. 5) are possible for special applications. The more voluminous batts also provide reliable protection against shadow marking and weave marking.

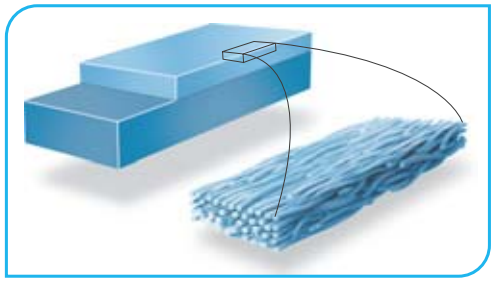

Fig. 5 MD batt top surface

2. The Seam

The seam loops are formed from the MD monofilaments of the base and therefore have a high level of tensile strength. Nevertheless the seam presents a differing geometrical structure to the rest of the base. The development engineers at Heimbach have succeeded in designing the "behaviour" of the seam zone in such a way that it is virtually identical to the rest of the structure. Obviously the outstanding regularity of the seam loops and density and evenness of the batt overlap contribute to this.

The high precision of the two rows of seam loops form a perfect wire-seaming channel and ensure in addition that the thickness of the closed seam is identical with that of the felt caliper. The danger of seam marking is therefore avoided.

3. Felt Installation, Seaming Process

It is always recommended prior to the installation of a seamed felt that the local machine conditions for the installing and seaming are discussed between the customer and the supplier.

Correct installation of a seamed felt will always have a positive effect on the subsequent closing of the seam. Therefore the first priority is for the felt to be positioned parallel to the rolls before installation (Fig. 6). The installation process should be carried out evenly and free of distortion, so that when both ends of the felt are in the closing position a completely straight row of seam loops is guaranteed.

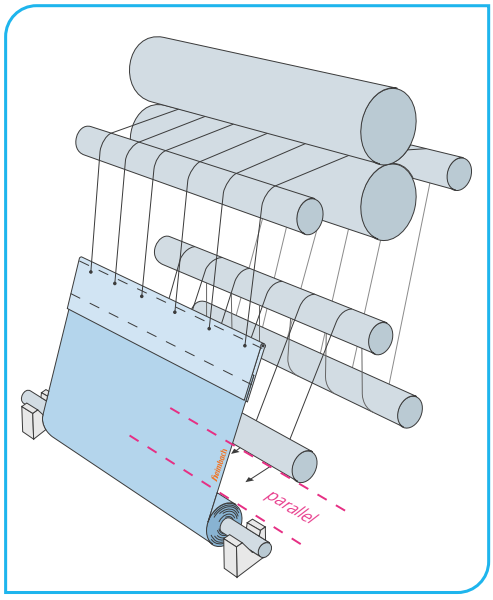

Fig. 6 Parallel installation

During the whole installation process the seam area should be protected from moisture: wet seam zones become wavy. For this reason the start of the felt is protected by a plastic sheet. The row of seam loops at the end of the felt on the unrolling beam is equipped with a protective foil to prevent application of pressure. Both rows of seam loops are secured with protective seam wired to prevent

deformation. The direction of felt installation can be dependent on the arrangement of catcher trays. In the event of sharp edges, installation generally against the running direction is recommended.

The best closing position is usually on a roll or another deflection free surface. When positioning the ends of the felt they should be carefully aligned in the machine direction and allowed to overlap one another (Fig. 7).

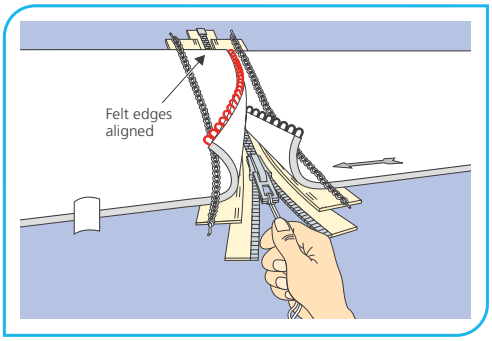

Fig. 7 Closing the seam

After closing the zip fastener the Heimbach seaming aid enables the seam loops to mesh alternately to provide a perfect closing channel (Fig. 8). The seaming process is completed after entering and securing the seaming wire with the removal of the aids such as the braking element and the zip fastener.

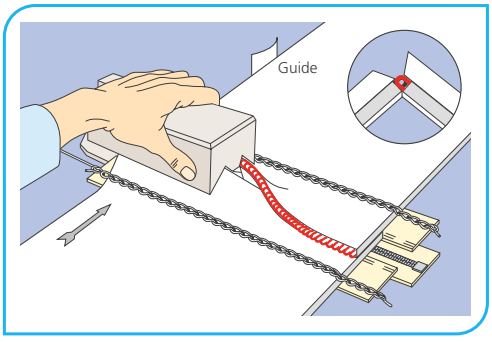

Fig. 8 Closing the seam

Detailed instructions and aids to installation and easy seam closing are delivered with every felt.

4. Conditioning on Start-up

After crawling the felt to establish parallel tracking it should be started up at normal operating tension (2.5 —3.0 daN/cm). During this process the felt must take up sufficient water. It is absolutely essential that the wetting out is carried out evenly across the felt width. Therefore the showers should be checked for even application. Only when the full width of the felt including both edges are fully wet out can dry streaks or dry edges be eliminated (Fig. 9 and 10). If necessary the use of edge showers is recommended.

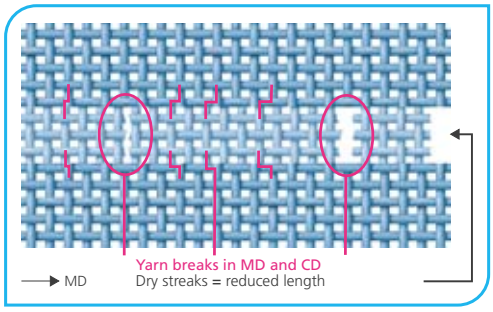

Fig. 9 Yarn breaks from dry streaks

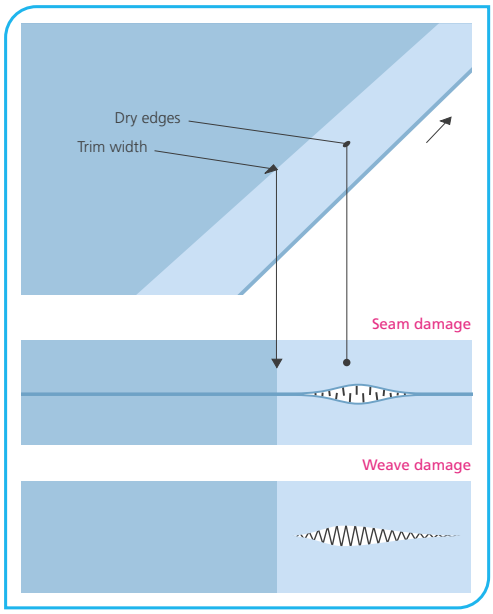

Fig. 10 Avoid of dry edges

5. Value Added by Using Heimbach Seamed Felts

Added value can be documented by the following two examples from practice. These data are only obtained from the quoted performance details. The advantages given in the introduction to this paper must also be taken into consideration.

5.1 Case Study Packaging Paper:
Increase in Felt Life

Position:	Bottom felt
Felt Width:	8.0 m
Speed:	av. 780 – 815 m/min

This was a particularly demanding wear prone position.

Previous Life:	av. 69 days
Life Heimbach CONNECT:	av. 85 days
Record Life Heimbach CONNECT:	89 days
Previous Felt usage:	av. 6 felts per year
Heimbach CONNECT usage:	av. 5 felts per year

The increased felt life resulted from good permeability retention, resistance to wear and high tensile values:

Residual Tensiles:	47 kN/m after av. 85 days (new value 62 kN/m)
Seam:	34 kN/m after av. 85 days (new value 41 kN/m)

Added Value for the Customer:

- Reduction of felt consumption by one felt peryear
- Reduction of down time

5.2 Case Study Newsprint:
Reduction in Break Frequency

Position:	Pick-up
Felt Width:	5.8 m
Speed:	av. 1100 m/min

On installing CONNECT seamed felts from Heimbach optimal trouble-free pick-up combined with increased press dewatering and good permeability retention were recorded. Additionally no edge trim problems or edge lifting. As a result of the improved runnability in this position the break frequency was reduced by on average one break per day.

Calculation of Added Value:

Sheet Width Reel:	5.31 m
Basis Weight:	45 g/m^2
Speed at Reel:	1070 m/min
Production Rate:	~256 kg/min
Production Loss per Break (av. 10 min):	2560 kg
Increased Production at av. one break less per day:	2560 kg/day
Increased Production per year:	895 t/year
Value at a price of EURO 450 per tonne:	EURO 402,750

Added Value for the Customer:

- Increased Production worth Euro 402,750 per year

Conclusion

CONNECT seamed felts are for the majority of all applications not only suitable but frequently the better alternative. Safer and simpler installation, shorter installation time with fewer operatives are for papermakers world wide additional important selection criteria for the application of Heimbach seamed felts.

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