

Seam Press Fabrics from Voith Fabrics – building on two decades of continuing technological evolution

Seam press fabrics have evolved dramatically since their European beginnings two decades ago. Their use has spread rapidly out of the board and packaging sectors, where the technology was initially applied, into a broad customer base ranging from graphics to tissue.

Many mills, primarily in North America, have realized that, in addition to easy, quick and safe installation, improved press performance could also be achieved. Seam fabric base constructions are made from 100% monofilament yarns and are stiffer and more “open” than their endless counterparts. They can provide higher void volume, enhanced water flow and more resistance to compaction in the nip. They also result in easier cleaning, better water handling, higher dryness out of the press, reduced shadow mark and increased speed.

In North America, seam press fabrics are dominant in board and packaging grades. Even for graphic applications, the number of machines using seam press fabrics is approaching 50%. In Europe, many board and packaging machines now regularly use seam fabrics, although acceptance has been slower on graphic grades. Nevertheless, the trend is beginning to accelerate in Europe as the newest seam technologies from Voith Fabrics can eliminate seam marking, even on the most critical grades.

Voith Fabrics’ advances in seaming techniques, batt flap design, needling procedures and base construction have extended the benefits of seam press fabrics to the most prestigious graphics paper machines in North America. Notably, Voith Fabrics supplied the world’s first successful installation on a high speed LWC machine shoe press.



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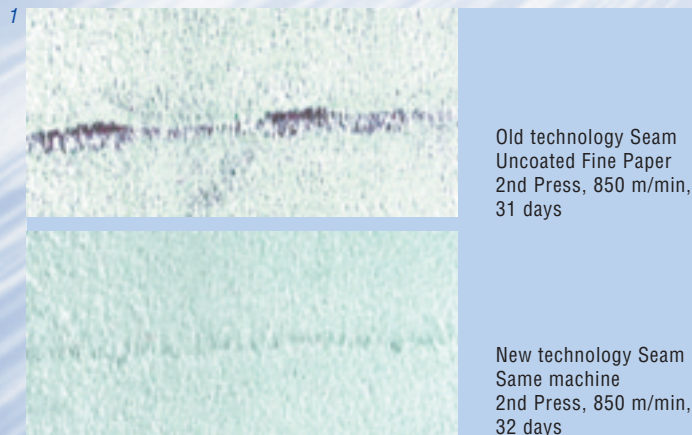


Fig. 1: New seam technology compared with traditional technology shows greater flap coverage of the seam even after running a longer lifetime.

Evolution of Seam Fabric Technology

With early seam fabrics, cutting of the needled batt to expose the base fabric loops resulted in a tendency for the batt flap to peel back and wear away from the seam area as it passed over Uhle boxes and other abrasive machine elements. This sometimes led to seam marking problems and early fabric failure. The way in which the seam flap was cut has since been changed and improved needling techniques, chemical treatments and use of low melt materials have enhanced the fiber bonding in the seam area, resulting in a much stronger, wear resistant flap as shown in *Fig. 1*.

By the late 1990s, the base fabric used in seam press fabrics evolved into a much more durable structure. Better materials were used to make seam loops stronger, stiffer and shorter, all but eliminating seam marking and loop failure.

As more and more machines started to use seam fabrics, successes were achieved on tougher and more demanding positions, including shoe presses. *Fig. 2* is a photograph of a new technology seam fabric after 44 days on a 1,050 kN/m shoe press. Few positions are considered unsuitable for seams with this advanced technology.

Driving forces

The driving forces for seam fabrics in Europe today are focused primarily on reduced downtime and above all, on the safety issue. Modern paper machines have low manning levels, which means the mills do not have a lot of people available to change clothing. Thus, seam fabric installation is well suited to today's paper machine manning practices and to the overriding need for safety.

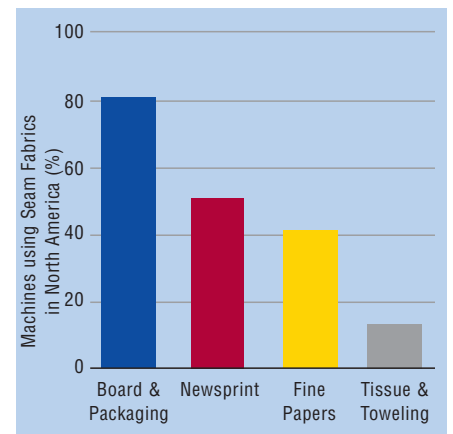
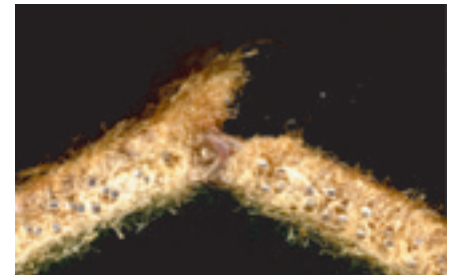
Market Applications – by Grade

Press fabric usage in general has declined in recent years due to consolidation of papermaking capacity in conjunction with the fact that modern fabrics have a longer operating life than even those of five years ago. Yet the proportion of seam fabrics is continuing to increase. In North America, about 40% of Voith Fabrics' press fabric output is in seam designs, and it has an estimated 28% share of the world seam fabric market. Voith Fabrics' average annual growth rate for seam fabrics has been more than 10% since the mid-1990s.

As shown in *Fig. 3*, some 80% of board and packaging grades in North America (concentrated in the U.S.) are using seam fabrics today. Approximately half of North American newsprint machines and roughly 40% of its fine paper machines

Fig. 2: New technology seam fabric after running 44 days on a 1050 kN/m (6000 pli) shoe press.

Fig. 3: Seam press fabric use in North America has increased dramatically in recent years, saturating the packaging and board grades fabric market and now being used in nearly half of the graphics paper machines.



are running them. Inroads are being made into tissue and toweling, after significant results have shown improved runnability and water-handling. Some 10%-15% of North American tissue machine press clothing is seamed.

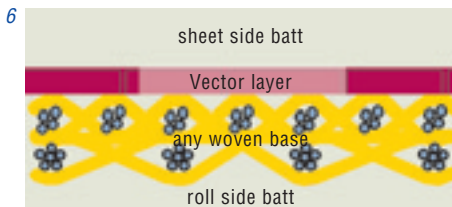
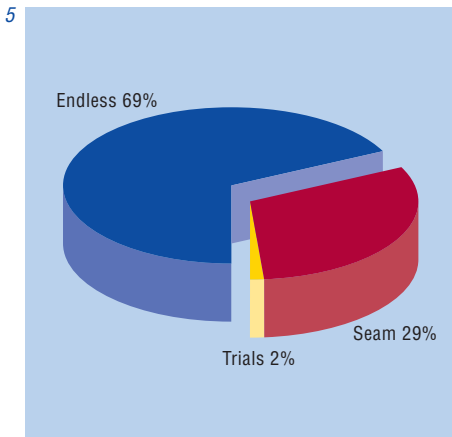
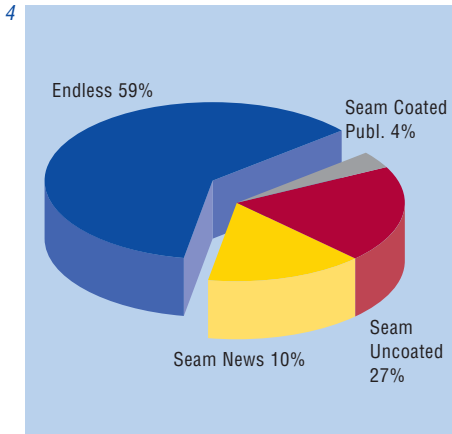
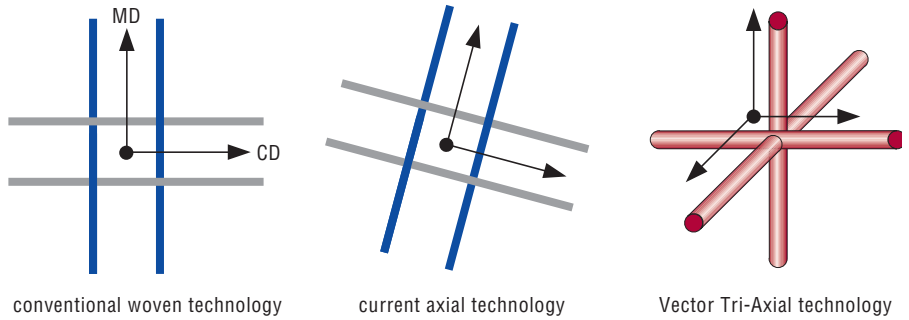
Fig. 4 shows Voith Fabric shipments of seam fabrics for graphics grades (including newsprint) in the U.S. from October 2000 through June of 2001. During that period, the trend toward increased seam fabric use in graphics grades continued, particularly in uncoated fine papers with some 1,051 units (180 ton) being shipped to uncoated fine paper machines,

Fig. 4: Voith Fabrics' shipments from October 2000 through June 2001 reflect the continued increase in seam press fabric usage on graphic paper machines in the U.S.

Fig. 5: Percentage of Graphics machines in Europe using seam press fabrics in one or more positions.

Fig. 6: Vector Cross Section.

Fig. 7: Vector Tri-Axial technology.



385 units (107 ton) to newsprint machines, and 154 units (25 ton) to coated publication paper machines.

As Fig. 5 shows, the switch to seam fabrics in the graphics paper sector has been slower in Europe, with only some 29% of machines (including newsprint) currently running them in at least one press position.

Excluding newsprint, only 5%-10% of other graphics grade producers in Europe use them at the moment, and again, most of these applications are on the medium to smaller, non-cantilevered machines.

European growth on the larger machines is currently concentrated in the newsprint sector, chiefly because this is a less mark-sensitive grade, but also because newsprint tends to be a slightly tougher sheet than, for instance SC or LWC grades.

Performance, Production Gains

The single monofilament yarns used in seam press fabrics provide the best compaction resistance of any of today's woven designs. Besides this significant benefit, a seam press fabric also provides exceptional masking characteristics. Nip impressions made with standard endless

fabrics over a blind drilled roll cover clearly show the marking from the holes. Using a seam fabric, the roll cover marks barely show, if at all. The seam fabric's stiffer base provides a more uniform pressure profile to the sheet.

A modern seam fabric, with its high void volume, handles water much better than traditional endless constructions. A seam fabric's compaction resistance, higher void volume and lower flow resistance all add up to increased water removal, longer lifetimes and improved sheet quality, as well as ease of cleaning. The result is significant production gains through higher sheet dryness out of the press.

Safety Benefits

Recent UK legislation places heavy emphasis on the risks related to press (and forming) clothing operation and installation. Even where a mill has a fully cantilevered machine, changing press and forming fabrics can be a strenuous, time-consuming and dangerous process.

The UK HSE measures are now being considered for implementation as an EEC standard. They are likely to be released within two years (EN 1034). Seam fabrics will answer some of the safety issues raised by these standards.

Vector

The new Vector design, unique to Voith Fabrics, is available in endless and seam versions and has the potential to become the market leader due to its excellent surface characteristics, pressure uniformity and water handling capability.

As seen in *Fig. 6 and 7*, Vector is a combination of a standard base fabric (or fabrics) and a non-woven “tri-axial” layer onto which batt is needed. Vector designs are ideal for seam fabrics because the tri-axial layer covers the seam area so well, giving the most effective prevention of seam mark of any fabric currently available.

The Vector product line was launched in North America in the summer of 2001, and is rapidly being accepted by brown and graphic grade machines at the highest speeds. Within the period of six months, 46 machines are already running Vector seam fabrics with another 127 trials in hand. To date, the product has had a 100% success rate and will be launched in Europe in early 2002.

Parengo saves time and improves safety

The Parengo mill near Arnhem, Netherlands, has been using seam press fabrics on its No. 2 newsprint machine for approximately three years. Seam fabrics were used first in the pickup position, followed shortly afterwards in the bottom position of the first press. The mill operates two machines producing newsprint and SC paper grades. PM 2 is 9.1 m wide operating at 1300 m/min and has a production capacity of 260,000 metric tpy.

According to René Keizer, assistant mill manager, the mill switched to seam fabrics on the non-cantilevered PM 2 to improve safety and shorten installation time, which had taken about five hours with an endless design in the pickup position. This has now been cut to less than two hours with seam fabrics.

“The endless pickup fabric was very large, stiff, and difficult to handle. We usually had to impregnate it with a softening agent to get it through the openings in the non-cantilevered frame,” he notes.

Seam fabrics in the bottom position of the first press have significantly simplified the installation process and created a much safer environment for employees. Mr. Keizer explains, *“With seam fabrics, workers don’t have to go inside the machine anymore. We don’t have to open up rolls, nips, etc. Particularly with the endless bottom fabric, we had to shift some guide rolls, which we don’t have to do now.”* The mill is also getting longer operating life. *“We will never go back to endless pickup and bottom fabrics”* he insists.