

WHITE PAPER

PERSONAL & HOME CARE



The business case for sourcing large-spooled nonwovens

Speed throughput, cut waste and lower the risk of errors.

P&HC (personal and home care) product brands wanting to streamline their nonwovens manufacturing operations need only look upstream to find their new BFF (best friend forever) — large format spooling (LFS) technology. It's a secret weapon in the fight to improve productivity, increase speed-to-market and reduce costs.

Spooling is a method for storing precision-formatted nonwoven materials that are fed into a manufacturer's production line. Compared with more commonly used pad rolls, large format spools cut costs by decreasing throughput time and reducing waste.

As a business case, shifting to large format spooling pays for itself in a few years and then returns dividends for the long-term life of your spooling investment.

Pad rolls versus large spools

Although widely used, pad rolls have limited capacity and need frequent change-out, often in less than an hour of manufacturing time. This slows production and leads to line stoppages. Pad rolls have other drawbacks as well, such as excessive material waste and requiring operators to "babysit" machines in anticipation of the next changeover.

Large-format spooling offers a solution. It allows production lines to run flexible nonwovens for at least 25 times longer than pad rolls depending on the spool type and application. In recent years, formatters of precision flexible materials have introduced large-format spooling systems for the manufacture of disposable baby diapers, incontinence products, feminine care products, disposable homecare cleaning pads, draw tapes, nonwoven medical and personal safety products, such as face masks, and flexible packaging and filtration substrates.

The spools work on the same principle as line on a fishing reel. Nonwoven, film, foil, foam, paper and other materials can be precisely slit in widths ranging from 1 to 12 inches. The larger widths, now available in spooled form, are ideal for adult incontinence briefs, home care cleaning pads and other larger personal and home care products. After slitting, the material is wound by the formatter onto large spools at the application's specified tension and pattern.

Spools carry far more material than pad rolls. Next-generation extra-large-format spools (XLFS) measure up to 5 feet in outer diameter (OD) and dispense over 500,000

linear feet of material depending on the material's basis weight. That's over 95 miles of material! At an end user's manufacturing facility, an unwinder efficiently draws material from the spool for subsequent threading into the personal/home care brand's production line.



Length and run time examples of slit pads vs LFS or XLFS spool formats

		48" OD pads	48" OD x 33" LFS	54" OD x 50" XLFS
#1	80mm x 200mm x .014" thick lofty ADL at 800 ppm	10,500'	110,800'	213,600'
		.33 hrs	3.52 hrs	6.79 hrs
#2	210mm x 360mm long x .003" thick baby diaper at 800 ppm	49,000'	195,400'	376,800'
		.87 hrs	3.45 hrs	6.65 hrs
#3	70mm x 220mm x .006" thick femcare strip at 1,000 ppm	24,500'	293,200'	565,100'
		.57 hrs	6.77 hrs	13.05 hrs

Extended run times

Companies that convert from pad rolls to large-format spools generally experience a huge increase in run time, throughput and total cost savings. And that is the main reason to invest in a change.

The chart above compares the performance of 48-inch OD pad rolls vs. large-format and extra-large-format spools for three different nonwovens: a high loft acquisition distribution layer (ADL) for diapers, a .003-inch-thick baby diaper cover and a .006-inch-thick feminine care strip. The chart compares both run time and material length.

Note that the pad rolls have a run time of only 20 minutes in the first example and less than an hour in the other two. In contrast, run times for the two spooled formats range from almost 4 hours to 13 hours depending on the material and application. In addition, the two spool types dispense significantly more material between changeovers than pad rolls.

Large-spool systems have additional benefits, including:

More efficient use of labor.

With fewer changeovers to worry about, machine operators spend less time tending to unwinders and production lines and can devote their attention to more productive activities.

Fewer errors.

During P&HC product manufacturing runs, finished-out rolls of nonwoven materials have to be spliced to fresh rolls. The more frequent this process, the higher the potential for error. As an example, frequent splices can create a material integrity issue. If a splice fails during production, the entire operation has to shut down and machines must be rethreaded. This is why eliminating the number of splices delivers a compelling advantage. Because large spools require fewer splices than pad rolls, they present less opportunity for time-consuming splicing errors.

Less material waste.

Misalignment between material rolls can occur during the splicing process. To account for this, production machines typically are programmed to reject the first 10 or so assembled products after splicing to catch imperfections. Rejected material diminishes with large spools' fewer splices. In addition, large spools can better accommodate wide incoming master rolls, lowering trim waste and further conserving material.

Compatible with functional printing.

Vibrant, multicolor printing can enliven nonwoven products and promote brand identity. Large-format spools are fully compatible with the latest printing processes, including the emerging trend of "functional" printing. In addition to promoting the brand, functional printing can communicate an item's condition. For example, it could indicate by a change of color when a disposable diaper, training pant, or brief is wet and needs to be changed or add functionality to a wipe or home care product.

Concerning your investment

Converting from pad rolls to large-format spools generally entails an investment for the P&HC product manufacturer in spool unwinding equipment and spooled materials, which typically cost more than materials supplied on pad rolls. There will also be a need to open up floor space to accommodate those large rolls of spooled materials.

Investment payback delivered via increased throughput, fewer changeovers and less material waste easily offsets initial costs. There's also the hard-to-quantify benefit of freeing machine operators for more productive tasks. Overall, manufacturers can expect to recoup their

investment in two to three years maximum. After that investment is paid off, large spools become a revenue earner compared to pad rolls.

Large format is the way of the future, and this is important to consider when investing in new manufacturing equipment or upgrades. Be sure to include unwinds for large and extra-large format spooling. Otherwise new or upgraded manufacturing equipment, such as a diaper line, will be saddled with old unwinding technology that cannot accommodate large or extra-large format spools.

A recent case

When a major manufacturer of hygiene products directed its supplier to deliver a delicate material in spooled form, the supplier came to Web Industries for assistance. The application involved an acquisition distribution layer (ADL) for diapers and similar personal care products. Web succeeded in winding the material on 48-inch OD spools containing nearly 100,000 linear feet of material. The large spools cut the number of splices needed during manufacturing while greatly boosting throughput. Splices were reduced from one changeover every 20 minutes to one every two or three hours, decreasing the number of roll changes by about 600%.

Precision formatters

Precision flexible materials formatters with large-spooling capabilities can smooth a P&HC product manufacturer's upgrade from pad rolls to spools and custom-design their spooling machinery to meet specific needs.

They will slit nonwoven materials to precision specifications and then wind the material onto large spools using computer-controlled surface winding technology. Computerized drives and motors adjust the winding tension as the rolls build in size. The result is large rolls with extremely low tension.

Large-format spooling systems are generally tested via a pilot program to ensure that they operate as designed. After testing is completed, engineers oversee installation at the end user's facility and fine tune for a trouble-free launch.



About Web Industries

A 100% employee-owned company, Web Industries, Inc., is one of the largest and most diverse providers of precision converting and outsource manufacturing. We help customers in the Aerospace, Medical, Personal & Home Care, and Industrial markets bridge their capability gaps and accelerate their go-to-market success by leveraging close, trust-based relationships to develop ingenious solutions precisely tailored to their needs. From project inception through commercialization, Web offers creative problem-solving backed by deep technical and operational expertise

The world's top personal and home care manufacturers trust our innovative engineering, converting, and manufacturing solutions to improve their products and their bottom lines.

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