

Thinking Outside the Box Keeps Items Securely Inside the Carton

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The rapid growth of e-commerce has spurred equal growth in the packaging and shipping industries. A report from Sanford C. Bernstein & Co. estimated that Amazon.com shipped 608 million packages in 2013—an average of over 1.6 million per day, or 69,000 per hour. That's a lot of cardboard boxes and packaging tape, two shipping elements that work in tandem to securely deliver carton contents.

Companies involved in e-commerce and consumer packaged goods have long faced a number of problems and inefficiencies, and many of these are a result of tape issues:

- **Material waste:** This is usually due to poor adhesion between the tape and corrugated cardboard box. Suppliers usually respond by switching to a wider, thicker or heavier duty tape, or simply use more tape altogether to keep cartons closed. Tape that must be repeatedly re-adhered also leads to productivity and efficiency issues.
- **User safety:** Safety comes into play at both ends of the packaging process: closing and opening cartons. Tape applicators traditionally have large, serrated blades capable of injuring an operator's hand, sometimes seriously. When a carton arrives at its destination, a worker must use a box cutter or knife to open it – using a sharp instrument to open the carton poses an obvious risk to retail workers and others working with boxes.
- **Content security:** Cartons are designed to protect their contents, but loose case seals caused by insufficient or poor tape application can lead to product damage, contamination and theft. Using a knife to open the carton can damage contents during the opening process. For example, a retailer receiving a shipment of designer clothes may lose thousands of dollars in damaged goods if an individual plunges a knife too deeply into a carton.
- **Productivity:** In a high-pressure shipping environment, changing out a tape roll or tape applicator is a time-consuming process that results in downtime. Even if a tape roll change only takes two minutes, the downtime and wasted productivity add up to monetary losses. And if an operator tries to rush the change process, they risk making mistakes or even injury from the tape applicator's blade.

Like companies that are shipping cartons, tape manufacturers have traditionally accepted these issues as harsh realities of the packaging industry. But Shurtape—a well-known tape manufacturer in Hickory, North Carolina—saw that safer, more efficient tape application was possible. They responded by [developing the ShurSEAL® automated case sealing system](#).

This system combines PrimeLoc™ tape application technology with Shurtape's HP Series packaging tape to deliver secure, reliable case seals and packaging line efficiency.

Folded-Edge Innovation

Packaging tape is a bit like a rubber band. When unwound from a roll, it stretches to adhere to a carton's surface. But the elastic properties of its polypropylene backing give it a tendency to return to its natural state, much like a rubber band snaps back when tension is removed. Overstretching the tape at the tape applicator worsens this effect, increasing the risk for carton seals to pop open in storage or transit.

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Folded-Edge® Technology—a major feature of ShurSEAL—helps off-set application issues like these. The folded-edge attachment mounts directly to the tape applicator and folds the tape's edges lengthwise during application. This simple technique produces a stronger, more uniform tape edge that is double the thickness of the rest of the tape and creates a number of advantages:

- **Strength:** Folding the tape's edges increases the seal strength at common failure points. Folding the edge increases the tape's energy-to-break—a measure of a tape's force and stretch when it breaks—by 14 percent over non-folded tapes.
- **Easy opening:** Folded-Edge Technology eliminates the need for box cutters and knives. Folding the tape creates a dry edge that end-users can simply grasp and pull to easily open cartons.
- **Reliability and productivity:** During tape manufacturing, microscopic nicks form on the tape's edges. These nicks can cause tape breakage. Folding the edges of the tape eliminates nicked edges to help prevent tear-outs at critical points.
- **Efficiency:** Using Folded-Edge Technology may allow users to down-gauge their tape grade, saving material and cost. Packaging tapes are available in a number of grades, which describe their backing thickness and amount of adhesive. With Folded-Edge Technology, users can take advantage of the tape's full adhesive properties, getting the same performance with less tape and adhesive.

A Better, Safer Tape Applicator

When companies have issues with tape adhesion and breakage, they typically blame the tape itself. And while introducing innovations like Folded-Edge Technology goes a long way toward solving those issues, addressing the tape applicator gets to the heart of the problem. This is where the patented PrimeLoc™ tape applicator—another key component of the ShurSEAL solution—comes in.

Most packaging tapes are pressure-sensitive and need what's known as wipe-down force to create a strong bond to a corrugated surface. Conventional automated tape heads wipe-down tape at two points: rollers placed at the front and rear of the tape head. This design results in an inconsistent pressure profile: tape adheres well to the edges of the tape, but has less adhesion in the middle.

The PrimeLoc tape applicator is designed with multiple, flexible wipe-down mechanisms that apply pressure at six points rather than two. The result, as seen in Figure 1, is a more consistent pressure profile that makes use of significantly more adhesive across the seal. The enhanced wipe-down allows the adhesive to penetrate deep into the carton's corrugated fibers to create a stronger, more reliable case seal. One that offers visual evidence of theft: fiber tear that provides a good indication that tampering has occurred.

Wipedown pressure on an under-filled box

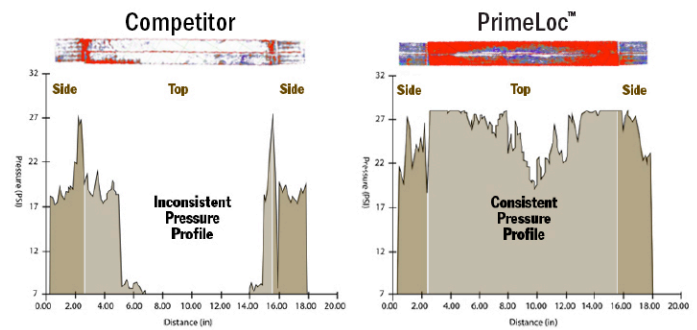


Figure 1: A comparison of the PrimeLoc pressure profile with a competitor's. (Source: Shurtape)

In addition to enhanced wipe-down, PrimeLoc applicators feature a half-dull, half-serrated blade that's smaller than conventional applicator blades. Conventional blades can inadvertently make tapes vulnerable to splitting by creating uneven cuts. The blade on the PrimeLoc tape applicator lowers the risk of splitting by delivering clean, straight cuts. And, its small size reduces the risk of cuts and injuries to operators, especially during maintenance.

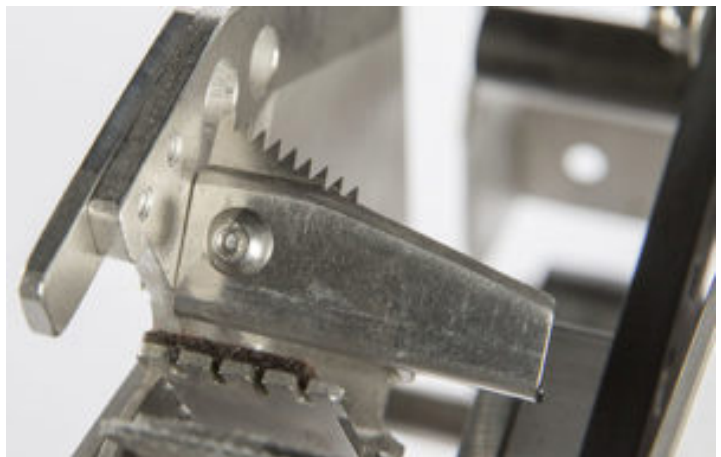


Figure 2: Shurtape's half-serrated, half-dull blade. (Source: Shurtape)

Other Innovations for Improved Efficiency

Shurtape's Quick Change sealing system, an extension of the ShurSEAL packaging family, is a further innovation that improves operator efficiency and safety as well as reduces downtime. Workers thread Quick Change inserts off-line, so changing out a tape roll is as simple as removing the empty insert and placing a pre-threaded one in its place—a process that can take as little as 10 seconds to complete. Compared to conventional tape applicators that take two minutes or more to be threaded on-line, the time and savings add up.

The Quick Change system is easier on operators, too: they are 60 percent lighter than conventional designs, and their interchangeable design eliminates the need for operators to crawl on the floor to change out bottom applicators. Plus, off-line threading means operators no longer need to rush through tape roll changeovers, reducing the risk of injury.



Figure 3A: A Quick Change PrimeLoc applicator. (Source: Shurtape)

Figure 3B: A Quick Changer insert. (Source: Shurtape)

The ShurSEAL solution is incomplete without Shurtape's HP Series packaging tapes. These hot melt sealing tapes offer the highest holding power to fiberboard in the industry. They are also designed with a special release coating, allowing an easy and consistent release from the roll that reduces the potential for stretching or breaking during application. Shurtape proudly labels HP Series as Good to the Core®: they run down to the core of the roll, ensuring efficient tape consumption with no wasted tape. And for extreme environments, Shurtape offers special hot melt formulations designed for use with recycled cartons or in subfreezing temperatures.

Packaging Myths: Busted

Shurtape's ShurSEAL innovations bust some longstanding myths of the packaging industry:

Myth #1: Box cutters and knives are an unfortunate reality

Truth: Shurtape found that the simple act of folding tape edges as applied eliminates the need for knives on the retail and receiving end. Sealing cartons with tape that is both strong and easy to remove by hand helps increase safety in the packaging environment and security of contents in storage or transit.

Myth #2: Packaging tape failure can be fixed by applying more or thicker tape

Truth: Folded-edge tape and better wipe-down force at the

tape applicator—both key parts of the ShurSEAL solution—enable better adhesion using the same amount of tape, or even less.

Myth #3: Downtime is a necessary evil

Truth: Downtime is the result of inefficient packaging operations. ShurSEAL's focus on tape adhesion, application and off-line rethreading significantly reduces or eliminates poorly sealed cartons and lengthy tape roll changeovers, two major sources of downtime.

Shurtape's Total System Approach

Innovations in tape and tape application technology are the bedrocks of a partnership with Shurtape, but that partnership often begins with the company's Single Shift Continuous Improvement (SSCI) evaluation. During the SSCI process, Shurtape uses ShurFlo technology to identify issues such as tape waste, tape application problems and downtime during an eight-hour shift on a customer's packing, sealing and palletization line. The company then sends an SSCI report that highlights any issues encountered during the shift and gives an estimate of annual productivity improvement from installing a ShurSEAL automated solution. Shurtape implements the SSCI evaluation free of charge and with minimal disruption to a customer's production line.

Shurtape also takes the performance of individual pieces of equipment into account using the overall equipment efficiency (OEE) metric. The company has found that simply swapping out a conventional component with a Shurtape product can result in OEE improvement of 2-3 percent, a number that leads to significant savings over time. As evidenced by the case studies on Shurtape's site, customers haven't just improved their downtime and productivity issues by implementing ShurSEAL; they've nearly eliminated them. A Michigan-based food supplier, for example, cut their production waste and downtime by 98 percent and is saving tens of thousands of dollars per year as a result of installing a ShurSEAL packaging solution.

ShurSEAL easily retrofits most case sealing equipment and doesn't require a major upfront investment. ShurSEAL is a simple solution to many key initiatives in large consumer packaged goods suppliers. It ensures continued sustainability, productivity and safety—three major pillars of a successful, efficient operation.

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ABOUT SHURTAPE TECHNOLOGIES, LLC

Headquartered in Hickory, NC, Shurtape Technologies, LLC, is a privately owned, fifth generation, global corporation that designs, develops, manufactures and distributes pressure-sensitive tapes that are available under recognizable brand names such as Shurtape®, FrogTape®, Painter's Mate Green® and T-REX®.

Through Shurtape® brand, we proudly serve a variety of markets, including packaging, building and construction, professional paint, HVAC, plumbing, stucco, abatement, industrial, maintenance, repair and operations (MRO), arts and entertainment, and transportation with a complete selection of high-quality, innovative pressure-sensitive tape solutions. That product portfolio includes cloth and duct, masking and paper, packaging, foil, film, electrical and double-coated tapes, in addition to manual and automated carton sealing equipment.

No matter the job, it's critical you're prepared. Shurtape has you covered with the tapes you trust – and the product features you demand – to deliver superior results.