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IT'S A WRAP

STRETCH WRAPPERS HAVE BECOME THE SYSTEM OF CHOICE FOR SECURING PALLET LOADS AND CLUB STORE BULK PACKAGES.

By Edward J. Bauer

Stretch wrapping is the most versatile and cost effective way to unitize pallet loads. It is extremely versatile and adapts to any load configuration on a pallet and is an example of sustainable packaging. It has replaced strapping as the preferred way to unitize a pallet, along with its sister, stretch hooding.

An overview of an entire robotic palletizing cell with a stretch wrapper located at the end of the line.

For starters, stretch wrapping equipment has a broad range of versatility. “Stretch wrapping equipment can range from small portable units all the way to completely automatic units and can handle any product put on a pallet,” says Chris Bettenhausen, vice president of sales and marketing at Nitech Industries,Columbus, Neb.

Jerry Todd, promotion manager at Lantech Inc., Louisville Ky., adds, “Customers appreciate how the technology works for them, whether they do only a few loads each day or when they do hundreds of loads.”

A high speed robotic stretch wrapper in motion, wrapping horizontally from bottom to top.

Stretch wrapping is ideally suited for securing a pallet load of product. A pallet load must withstand two different types of dynamic loads, vibration and impact, to remain intact. Stretch wrapping controls both of these forces adeptly.

Vibration and sway are forces that occur when objects like airplanes, trucks or railcars are in motion. In the case of a truck, for example, the roughness of the road in combination with the mechanical factors of the truck’s movement produce a number of regular, periodic frequencies (resonance) that are present on all types of road surfaces. These vibrations combined with those generated by the truck cause cases on a pallet to shift or slide laterally if they are not restrained. These forces are relatively easy to contain but are constant throughout the transit of the product. Their repetitive nature can cause restraining materials to fail by constantly flexing them at specific points.

Impact forces are big dynamic movements a pallet of product must withstand. These forces are generated by rapid starts and stops, extremely rough roads and collisions such as those incurred when freight cars are coupled. The force generated is sufficient in strength to move the load off the pallet, or to bounce product up and down with such force that the bottom layer and other layers on a pallet become damaged or crushed. Strong and immediate application of counter (restraining) forces are the only way the problems they cause can be stopped.

Stretch wrapping is a system ideally suited to handle both of these dynamic loads. It is a sustainable technology that uses the minimum amount of material to do the job. It capitalizes on plastic properties in a way that maximizes their strength and effectiveness.

WRAPPING PALLETS

A stretch wrapper uses one of two techniques—conventional or pre-stretch—to wrap a pallet in plastic film. The conventional method places the pallet load on a turntable and rotates it while drawing stretch film from a roll carriage apparatus that moves up and down as the pallet spins. The tension or stretch of the film takes place between the roll of film and the pallet load. Some type of brake, either mechanical or electrical, applies tension on the unwinding film to create the retarding force that stretches the film around the load. It is difficult to achieve high stretch rates with conventional shrink wrapping equipment.

TEN FACTORS TO CONSIDER WHEN BUYING A STRETCH WRAPPER

Investing in the right stretch wrapper for your application will maximize productivity, cut costs and offer years of trouble-free performance, so it pays to research your options carefully. These ten factors can help you narrow the choice.

1. Robust construction – A solid machine will offer reliable performance over the years, even in less-than-ideal conditions. Stronger machines are less likely to break down, saving you the cost and hassle of unplanned downtime.

2. Cutting-edge technology – Improvements in stretch wrapping technology in recent years have resulted in new generations of machines that can wrap faster, stronger and more reliably. These more advanced machines offer a clear competitive advantage when it comes to maximizing productivity.

3. User-friendly equipment – The more efficient machines on the market are easy to use and easy to maintain. Their intuitive control panels minimize hands-on operator time and the possibility of human error.

Creating sufficient force to maximize film stretch can collapse corners on corrugated cases, shift the load on the pallet or tear the film on sharp edges of product. Actual stretching of film falls in a range of 10 to 40 percent, which is short of the plastic film's stretch capability. This increases the cost per load because the yield on plastic film is low in comparison to the second method of stretch wrapping.

Pre-stretching plastic film is the second method for wrapping pallets. This method adds a second roller to the film carrier and stretches the plastic film between the two rollers; it then wraps the pre-stretched film around the pallet with no additional stretching of film between the last stretch roller and the pallet load. This method of stretch wrapping improves the utilization of plastic film and reduces the cost to stretch wrap a pallet by 20 to 40 percent. The large cost saving is achieved by stretching the film as much as 250 percent between the two stretch rolls, making maximum use of material. Remarkably, the additional stretching increases the strength of the film applied to the pallet through mechanical orientation of the plastic. By pre-stretching the film, the process is not dependent on the strength of the load corners and it eliminates the potential for puncturing or tearing the film during the wrapping process. Pre-stretching takes maximum advantage of all the mechanical properties in a plastic film and improved mechanical application of the wrapping process to hold a load together. Pre-stretching equipment is normally more expensive than conventional stretch wrappers and requires more pallet volume to take advantage of the reduced use of film.

Two methods for wrapping a pallet are used with either the conventional or pre-stretch techniques for elongating the film. These methods are called full wrap and spiral wrap.

The full wrap technique uses a roll of plastic film equal to or slightly larger in height than the pallet and product load. The large plastic web wraps completely around the pallet load from top to bottom each time the pallet turns. This method was developed because it is faster and simpler than the spiral wrapping method. It is well suited for high volume pallet operations. Its drawbacks are inflexibility in handling multiple height pallet loads and the weight of the plastic film rolls is considerably greater than those used for spiral wrapping. This complicates in-plant handling.

Pallet loads entering a stretch holding system. Here the product is encased in film in one motion from above the pallet, rather than the film wrapping around the sides of the pallet.

Spiral stretch wrapping is thepredominant method now in use. This technique utilizes a roll of film 20 to 30 inches wide. The pallet load on the turntable rotates in front of the roll carrier and the roll of plastic moves up and down creating a spiral winding pattern on the pallet. The number of wraps, often tailored to the product being wrapped, is influenced by load profile, load weight and the method and distance of shipment for the product. Custom tailoring the number of wraps permits selective distribution of film at the top and bottom of the load to address the areas of greatest stress during shipment.

Increasing stretch levels allows one to use less film. Stretch force is the amount of force exerted by the film on the load; it is highest in the corners and lowest on the sides of a square pallet load. Re-stretch force is the amount of stretch still available in the material to combat both dynamic and vibration forces. It's the "rubber band" effect of thin plastic films. Finally, breaking strength is the ultimate amount of force a film can withstand before failure.

4. Warranty – Warranties can vary widely from one manufacturer to the next, so factor this in your final equation because even the best machines can experience problems.

5. Support and service – Unplanned downtime is extremely costly. Ask the supplier about support and service. If your machine breaks down, who do you contact for help and if needed, how quickly can a technician be at your site?

6. Affordable price – Surprisingly, some of the industry's best stretch wrappers are priced competitively to second-rate machines. Also remember that a superior machine will run more efficiently and make better use of stretch film, resulting in cost savings that will quickly add up.

7. Attention to detail – Today's stretch wrappers are sophisticated machines with lots of moving parts. The best machines feature quality components and craftsmanship throughout.

8. Manufacturer experience in the industry – Favor manufacturers with machines already wrapping—successfully—in your industry. This experience means they are better positioned to meet your particular wrapping application.

9. Safety - A good machine will come equipped with basic safety features such as emergency stops, photoeyes and safety fences. Top-of-the-line stretch wrappers boast more sophisticated safety features.

10. Reliability – All of the above doesn't matter if the machine can't get the job done load after load, day after day. Make this your main consideration and you won't be disappointed.

Colinda Lavallée
Marketing Coordinator
Wulftec International Inc.

Pallet loads exiting a stretch hooding system. The presealed hoods offer protection from water and any other possible external contaminations.

EQUIPMENT OVERVIEW

Stretch wrapping equipment is available in a wide variety of configurations. It starts with simple hand operated systems and progresses all the way to fully automatic systems. Semi-automatic systems are the most common. A forklift driver positions the pallet load on a platform that rotates and activates the equipment. The stretch wrapper automatically starts the wrapping process and at its completion cuts off the film and secures it. Because the equipment can operate in an autonomous way, many operations add a length of conveyor to the system after the stretch wrapper. The pallet is automatically wrapped and ejected onto the conveyor. The equipment is ready for the next wrapping operation and the forklift operator can more efficiently utilize his time in moving product to and from the stretch wrapper.

Stretch wrapping equipment normally uses a rotating platform but can be configured to leave the pallet stationary and rotate the roll of film around the pallet and load. Rotating the roll of film is advantageous when very heavy or very unstable loads would be difficult to rotate on a platform.

Using a machine that rotates the film to wrap mixed loads is very advantageous for distributors and companies with large distribution centers.

“A ‘stretch wrapping robot’ as we call it, works well for mixed pallet loads,” says Greg McGuire, vice president key accounts, Aetna Group USA, Duluth, Ga. “These semi-automatic machines are portable and use a wheel to follow the load, customizing the shrink wrapping.” The ability to wrap mixed pallets is very important for customizing mixed pallet loads for specific stores. It is also important for odd shaped and difficult to wrap products that need to be stabilized on a pallet for shipment.

A conveyorized automatic stretch wrapper easily integrates with upstream robotics.

System integration is a new theme for many stretch-wrapping operations. “Large customers are requiring we integrate a stretch wrapper with our palletizing equipment,” says Salh Khan, president, Aidco Inc., Cincinnati, Ohio. “We handle both standard and mixed pallets with our systems and our stretch wrapper supplier, Aetna, provides systems that permit wrapping of the entire pallet, or wrappers that will do one or two tiers at a time to stabilize the load when we build mixed pallets.”

Stretch hooding is another way of stretch wrapping a pallet. Stretch hooding creates a large tube sized to the pallet from a roll of film. The film is cut and heat-sealed at one end. Four arms then grasp the open tube and stretch the material while moving it over the pallet load. The material covers the complete pallet and part of the underside of the pallet when released by the arms. This technology provides a waterproof cover for products like cement, giving them and other water sensitive products additional protection. It also seals pallet loads from possible external contamination. The pre-sealed hood is very clear permitting easy reading of product labels. The cost of stretch hooding is equivalent to stretch wrapping. “Stretch hooding has been gaining in acceptance and popularity over the past eight years. It is very versatile and is slowly becoming recognized as a new pallet stretch wrapping technology,” says Irfan Oezdemir, general manager of Marietta, Ga.-based MSK Covertech Inc.

A pendant controlled model replaces hand wrapping.

Stretch wrapping is a versatile and economical process that is very sustainable. It’s an efficient way to use plastic film and to obtain the maximum strength possible from the material. The next time you see a loaded pallet, look closely, it will be stretch wrapped.

Ed J. Bauer spent 25 years as a packaging director, engineer and chemist for Campbell Soup Co., Abbott Laboratories, Wyeth Laboratories and Bausch and Lomb.

An all steel model offers high unitization for loads up to and over 120 inches and 600 lbs.

Talk The Talk (T3): Stretch Film

TAKING THE MEASURE OF PACKAGING TERMS

If you've ever used a rubber band, you understand the underlying principal of stretch film. If you've never used a rubber band, reading this edition of TTT might help you understand how a rubber band works, but it's no substitute for snapping a thin elastic strap against your cheek. That'll smart. But you won't forget that a stretched rubber band—and extended stretch film—want to return to their unstretched states. Using the following terms will help you SOUND like you know a lot about stretch film . . . and no one will guess that you've never used a rubber band.

Angel Hair: Thin strands of stretch film on the edges of stretch film rolls caused by improper bologna slicing (of the film, not the luncheon meat).

Banding/Bundling: Wrapping several items together with stretch film. The technique is used most frequently for stabilizing pallet loads.

Blown Film: Film, including stretch film, that's made by extruding molten polymer into a tube and expanding the tube like a balloon with air pressure from within the tube. Blown stretch film is typically more puncture resistant than cast film, making it particularly well suited for stretch wrapping irregularly shaped loads.

Bologna Slicing: A process for slitting a roll of film by pressing a rotating blade against it. The term comes from the fact that the process is reminiscent of the slicing of rolls of lunch meat. The friction of the blade can sometimes melt the film where it's being sliced, leaving a stringy residue called angel hair along the edges of the sliced roll.

Bottom Wraps: Stretch wrap applied to the lower portion of a pallet load to enhance the stability of the load.

Cast Film: Film produced by continuously pumping the molten polymer through a straight slot die, then chilling the hot plastic immediately by running it through a pair of chilled rolls.

Cling: Stretch film's tendency to stick to itself. Some stretch films are characterized by self stickiness on both sides of the web. Others have cling only on one side.

Dancer Arm, Bar or Roll: A roller on the outfeed of the film roll that controls the tension of the film as it's wrapped around the load.

Film Feed: The speed of the film as it's unwinding and being applied to the load. To maintain a constant tension on the film, it typically accelerates and slows down as it is wrapped around the rectangular load.

Film Force (Film Tension): The product-hugging force exerted on the product being wrapped by the stretch film. This force is measured in pounds.

Film Force Release: The relaxing of the tension on the stretch film, usually occurring at the beginning and end of the wrapping process.

LDPE or LLDPE: Low-density polyethylene (LDPE) is common stretch film type. A stronger, clearer stretch film option is linear low density polyethylene (LLDPE).

Machine Direction (MD): As the web or ribbon of film is unspooled and wrapped around the load, it typically moves in a direction parallel to the length of the ribbon. This is called the machine direction or MD.

Maximum Stretch: This is as far as the stretch film or rubber band can be extended without tearing.

Neckdown: The narrowing of a width of stretch film. Neckdown reduces the coverage each wrap provides thereby making it likely that more wrap rotations and more film will be needed to wrap a load or pallet.

Overwrap: The amount of stretch film applied over the top of a load. The overwrap exerts a downward

force on the pallet load.

Poststretch: Poststretching is stretching a film by using the load to pull the film out at the same time as application.

Prestretch: Stretching of the film prior to application to increase film strength, improve load integrity, reduce amount of stretch wrap film needed and save on stretch film packaging costs.

Recovery: Tendency of stretch film (and rubber bands) to return back to their original form after they have been stretched.

Roping: Bunching of the stretch film's full width to create a rope.

Transverse Direction (TD): The width of the film web.

Stretch wrappers: Machines that wrap plastic stretch film around a loaded pallet. The film provides extra support while the products are being transported so that they do not tip, spill or otherwise become damaged.

Ben Miyares, vice president for industry relations at PMMI, has been a recognized authority in the packaging industry since 1963.

STRETCH WRAPPING PRODUCT NEWS

The Aetna Group currently ranks asthe worldwide market leader in the technologyof stretch film wrapping. Its RotoplatLP-As is capable of automaticallywrapping pallets. The machine has aremote control for starting up the cycleand the Pinza & Taglio film gripping andcutting unit with incorporated sealingdevice that ensures the gripping, the cuttingand sealing of the tail of the film thatadheres perfectly to the pallet. A uniquefeature of the Rotoplat LP-AS is theturntable, which is only 92mm above theground and enables the loading and theunloading of the pallet by way of a ramp,with simple transpallets rather thanforklifts.

The Aetna Group
678-473-7896
www.aetnagroupusa.com

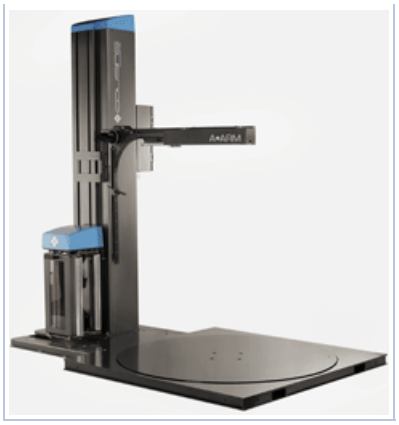
B.W. Cooney & Associates in conjunctionwith Omori Machinery CompanyLimited, offers a family of various HorizontalPVC Stretch Wrappers with speedsof up to 120 packages per minute. Capableof handling all types of trayed products,high speed wrapping can give youincreased production while cutting yourpackaging costs. Complete with automaticinfeeds and complete computercontrol through touch screen menus.These units offer ease of use and a manageablefootprint for even the smallestpacking facility.

B.W. Cooney & Associates
905-857-7880
www.omori.co.jp

CannTec LLC introduces the OSWseries of stretch wrapping equipmentwith loading station designed for longnarrow boxes, tubes and building supplies.It is equipped with a safety lightcurtain for safe loading and delivery ofthe product into the machine. With drivenlow profile conveyors, it can adapt tomost production lines at any level ofautomation. It uses standard machinegrade stretch wrap from 3 to 10 incheswide with a pre-stretch film delivery carriage.The stretch film process uses noheat or ovens and reduces costs by asmuch as 70 percent in materials andelectrical consumption.

CannTec LLC
203-421-4697
www.canntec.com

Cousins PackagingInc.'s latestinnovation,the patentpendingSuperRapid ThreadPre-StretchCarriage allows the user to take advantageof today's hi-tech films and increasefilm savings through maximum film yield.The Super Rapid Thread Pre-Stretchachieves 60 percent film roller contact(as compared to the industry norm of 35percent) on a safety door style carriage.The dramatically reduced slippage that itrepresents means higher film yields andgreatly improved film clarity for



reliablyand efficiently scanning barcodes. Thecarriage is available as an option on allfull-sized Cousins equipment or can beretrofit on most competitive wrapperswith the field retrofit kit.

Cousins Packaging Inc.
888-209-4344
www.cousinspackaging.com

Lantech's new Q-400XT stretch wrappingsystem halves the cost and time forpallet wrapping with Simple Automation™that eliminates the need for the fork-truckoperator to touch the load. Started with aremote lanyard, the Q-400XT automaticallyattaches the film to the load, wraps it,locks the load to the pallet with a Pallet-Grip® film cable and cuts the film.

Lantech
800-866-0322
www.lantech.com

Nitech's PT20/20 stretchwrapper offers aheavy-duty 10gauge formedsteel tower forruggedness andstability. TheHI-SLIDE telescopingmast enables wrapping loads upto 111in. tall. The built-in telescopingmast eliminates field installation ofextended mast structures and allows theLP 2020 to be shipped completely assembled.

Nitech Industries
402-563-3188
www.nitechindustries.com

The Douglas Contour™ SPS-75 hasexpanded capabilities to pack products intotrays, on pads, u-boards and now film only.Enhanced SPS-75 features include theSmartrak® Steady Stream Infeed, Slipstream™ Pinless Metering, side filmstands and quick-change servo drivenwrapping wands. Built-in flexibility assureslarge size ranges and quick, tool-freechangeovers. Each feature is very simpleand easy to understand. Smartrak SteadyStream Infeeds' uniquely repeatable operationhandles lightweight containers withease, meeting sustainability objectives.Slipstream Pinless Metering requiresminor adjustments, a slipsheet changeand intuitive steps through the controlpanel when completing a changeover. Aconvenient side-mounted film stand ismounted outside the machine and at waistlevel for easy and ergonomic film loadingand splicing.

Douglas Machine Inc.
320-762-6243
www.douglas-machine.com

The fully automatic MSK Tensiontech Fstretch hood applicator with its special filmstretching process makes it possible for allthe common sizes of industrial pallets to bepacked with just one film tube. The stretchingof the film is regulated in a targeted mannerfor each pallet size so that optimum loadsecuring properties are achieved in eachcase. In contrast to conventional packagingmethods, the MSK stretch hood packagingsystem ensures that the surface of the filmafter stretching is of a high quality permittingan optimum display effect. Barcodes underthe film can be scanned without any problem.

MSK Covertech
770-928-1099
www.msk.de

For help or further information, you can reach PMT in the following ways:
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