Automated Pallet **Stretch Wrapping**

Selection Guide

FOODMACH

Automation | Robotics | Integration | Turnkey Projects

Choosing **the right wrapper**

Buying packaging machinery technology is never an easy decision.

There are many factors to consider and many vendors to choose from.

This guide book has been written to assist you in choosing the best fit pallet wrapping technology for your application.

It covers:

- What is pallet wrapping?
- Why is it important?
- How it differs from shrink wrapping?
- Types of stretch wrapping solutions?
- Considerations when choosing a solution
- Top 5 pitfalls to avoid
- Advantages of an automated solution
- Calculating savings

What is pallet stretch wrapping **and why is it important?**

Often considered the last step in your packaging line, pallet stretch wrapping is actually the first step in your fulfillment supply chain.

It is the process of securely wrapping the pallet with stretch-wrap film to protect, stablise and unitise your manufactured product, ensuring it moves efficiently and securely through the supply chain.

This step has a huge impact on the condition of your product as it reaches its final destination, often a retailer distribution centre or retail store. Reducing or eliminating the amount of damaged product is one way stretch wrapping can save you money. Correctly wrapped pallets ensure that shipping cartons do not move or collapse in transit.

Correctly wrapped pallets also protect your load from many natural elements in the supply chain, such as rain, condensation, humidity, dust and even sunshine. An estimate suggests as much as 11% of unit loads arriving at a distribution center have some level of case damage. On average the figure is around 2%, making millions worth of product a year unsaleable from in-transit damage resulting from ineffective stretch wrapping.

Effective stretch wrapping also reduces the chances of product theft. Using a black stretch wrap film also provides visual security of the wrapped load.

OF CASES ARRIVE DAMAGED

Reducing or eliminating the amount of damaged product is one way stretch wrapping can save you money.

How is it different **from shrink wrapping?**

Stretch wrapping is when stretchable thin plastic film is wrapped around a load of products, typically on a pallet. This elasticity of the film holds the load tightly together.

Shrink wrapping is when plastic is covered loosely around a product or load and it shrinks tightly when heat is applied.

A heating machine is essential when using any type of shrink wrap. Some of the shrink wrap machines available for heating are; heat guns, which release a stream of hot air, and shrink tunnels, which are mounted over or around a conveyor system for the product to flow through, along with ovens.

While stretch wrapping is mostly for pallets, shrink film is often used as retail packaging typically used to bundle multiple products or to protect individual products. Shrink film is made of polyolefin plastic and can be pre-printed to create an appealing retail package. Stretch film is a less expensive and more flexible pallet stabilisation option compared with shrink film.

A further option for wrapping pallets is pallet stretch hooding. This process stretches a single 'bag' over the entire pallet, releasing it in place to provide load stability and complete product protection.

The purpose of all three is to protect the product.

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Stretch film is less expensive compared to shrink film.

3 types of stretch **wrapping processes**

Pallet wrapping can be done manually for manufacturers producing a few pallets a day. Semi-automatic and fully automatic stretch wrapping solutions are available for manufacturers with higher production capacities.

1. MANUAL

Manual stretch wrapping 'machines' consist of a stretch wrapping bar. A worker secures the film to the pallet and then manually wraps the film around the load starting at the base of the pallet.

Manual wrapping is dependent on the skill of the worker and generally has the highest material cost per pallet since there's no substantial pre-stretch.

This format is ideal for small operations that wrap and ship a few pallets a day.

2. SEMI-AUTOMATIC

Semi-automatic stretch wrap machines require an operator to place the pallet loads on the stretch wrapper using either a fork-lift or pallet jack. Normally, the operator manually ties the film-tail to the base pallet to initiate the wrap cycle. After which, the stretch wrapper rotates the pallet while a vertical mast moves the roll of film up and then down the pallet load.

Semi-automatic stretch wrap machines are suited for medium sized operations producing somewhere between 10-20 pallets per day.

3. FULLY AUTOMATIC

Fully Automatic Stretch Wrap (FASW) machines are available in three formats, described below. The obvious key benefit is that no operator involvement is required at any stage to wrap pallets, other than replenishing rolls of stretch film as required.

FASW's are always fully integrated into a pallet conveying system placed after a shipper palletising machine.

Outfeed conveyors from the FASW deliver pallets to a fork-truck off-take station, or even to an automatic pallet put-away solution.

The 3 FASW design options are typically matched to production volumes and other load factors, though in all cases they will cope with pallet rates of any where between 20 pallets per day up to as high as 120 pallets per hour.

The 'best fit' solution depends on many factors including stability of the packaged product, product supply chain, production volumes and capital budgets.

3 types of fully automatic **stretch wrappers**

There are three main types of fully automatic stretch wrapping solutions, with designs based on factors such as pallet size, pallet weight, pallet height, load type and load stability.

1. TURNTABLE:

The pallet is conveyed on to a turntable which rotates the pallet load while it is stretch wrapped by a tower moving up and down to wrap the whole pallet. This method is most suited for light to medium weight stable loads that do not get dislodged while rotating around on the turn table.

A typical maximum production rate for a turntable based FASW is 50 pallets per hour under defined wrapping cycles and pallet sizes.

2. ROTARY ARM:

A specialised arm rotates around the pallet to wrap the load, while the load is stationary.

This system requires a larger footprint than a turntable wrapper and is best suited for heavy or unstable loads.

It has a wide typical production rate range of between 50 to 140 pallets per hour.

3. RING STYLE:

The film carriage arm is mounted to a ring that allows rotation of the film roll around the stationary load.

These systems are most useful in high-volume manufacturing lines, or for larger loads. They can also wrap multiple loads at a time.

They are best suited to production capacities of between 100 and 200 pallets per hour.

Top 10 considerations for **choosing a solution**

The choice is simple if the number of pallets being wrapped per day is very limited. If the number of pallets being wrapped is more than 20, the decision becomes harder.

Consider what is important to your site and what the business goals are. If a business goal is to improve sustainability by reducing packaging, then look for a pallet wrapping solution that saves film without compromising the integrity of the pallet stability.

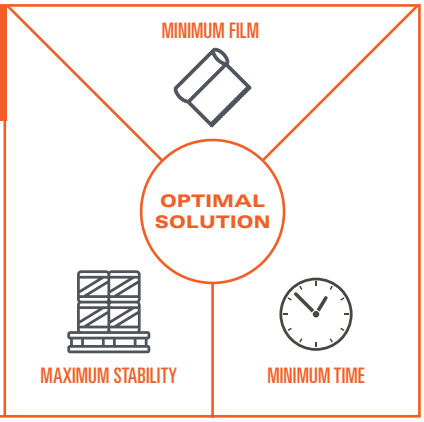
If the goal is to improve automation, then look for an automated wrapping solution that can be integrated easily with the existing packaging line and requires less adjustments and programming.

Here are the 10 most important factors to consider when selecting a stretch wrapper.

1. What is the maximum number of pallets to be wrapped each hour, allowing for future duty expansion?
2. How stable will the unwrapped pallet be if it is rotated?
3. What are the physical dimensions and weights of the pallets to be wrapped?
4. How much space is available for the wrapper?
5. If you've experienced damage during shipping, what is it caused by?
6. How will the pallet be loaded on to the stretch wrapper?
7. Is the secondary packaging fragile or unstable?
8. How important is reducing the amount of stretch film used to your business?
9. Can the wrapper adjust its wrap cycle for different products or at different vertical positions on the same product?
10. Is good service support available?

Ultimately, the main question is:

How can you ensure the pallet load is as stable as possible using the minimum amount of stretch film and time taken to wrap the pallet?



Top 5 pitfalls **to avoid**

From unsecured pallets to poor stacking patterns and lack of testing—these are the factors that will affect your return on investment.

Pitfall #1: Guessing the details.

It is really important that you know the details of the application before you go out to market. Some of the basic details needed to specify the application and get the right solution include:

- Length, width, height, and type of pallet
- Product stability and packaging type like shape of cartons, cans or bottles
- Maximum throughput required per hour
- Conveyors, space available, loading options
- Do you need options like a waterproof or dust proof top sheet or corner posts to eliminate pallet crushing?
- Would you prefer fully automatic film reel changes?
- What is your preferred electrical control platform, if you have one?
- Electrical information such as voltage, phase, and frequency

Pitfall #2: Ignoring the steps preceding pallet wrapping.

Here are some important steps that will lead to pallet wrapping success.

Step 1: Improve the integrity of primary and secondary packaging

The quality of primary and secondary packaging, along with other packaging materials such as tier sheets and corner posts all impact on the condition in which your product reaches the retail stores. Logistical demands need to be balanced with business requirements such as shelf-ready packaging, branding, cost of packaging, sustainability and environmental concerns. Good quality primary and secondary packaging facilitates pallet wrapping success.

Step 2: Load stability and stacking patterns

Before stretch wrapping a pallet, it is important to make sure the stacking is optimised. A column-stacked pattern gives good compressive strength while an interlocked pattern gives better lateral strength and stability. The stacking pattern is dependent on case type and pallet utilisation. A well-stacked pallet is a more stable pallet.

Pitfall #3: Not enough testing.

Testing is essential with different film types, different load types and machine settings for optimal results. Some of the most common causes of film breakages are load type, film quality, wrapper machine settings, and sometimes operator error. Film test cycles are important to determine how much the film can be stretched without breaking to ensure that it does not break during wrapping.

Cont....

How do you ensure the pallet load is as stable as possible with the minimum amount of stretch film? The magic lies in getting the containment force right. This is the pressure holding the load together and is created by the number of revolutions of the stretch film multiplied by the tightness of the wrap, called the 'wrap force'. The minimum threshold level of containment force on a load determines its success. If the containment force is too low, the risk of an unsecure pallet is high.

There is a trade-off between the wrap force, layers of stretch wrap and throughput. Testing is usually required to get the optimal solution to ensure an effective and efficient wrap pattern.

Pitfall #4: Over specifying or under specifying the application.

There is a propensity to overstate the requirements. So long as the requirements are clearly based on future growth plans, there are no issues. If the requirements are overstated since the details are unknown and a buffer is built in, the solution may end up being over budget.

The reverse is also true. If the requirement is understated to save money, the machine may not meet the requirements in which case the investment is a waste.

Pitfall #5: Not spending time on integration.

An investment in a pallet wrapper can be an opportunity to automate a possible bottle neck to improve efficiency, productivity and use the data for real time reports. Integration can also remove potential occupational health and safety issues. An automated solution can be networked to an integrated line control and/or warehouse management solution.

"The Robopac stretch wrapper was evaluated through our normal procurement processes; it was the best fit for our requirements, was good value for money, and—with Foodmach as the agent—allowed for seamless integration."

"The Robopac stretch wrapper met our production rates of 100 pallets per hour; was capable of operating in a cool store environment; met our site-specific electrical and automation specifications; was at the right price point and rated well in total cost of ownership."

"And, importantly, Foodmach met our project timelines." **Engineering Leader, Lion**

Advantages of an automated **pallet wrapping solution**

Automated pallet wrapping can improve efficiency, save money and make your production line safer. Here's how these significant benefits are delivered.

1. HIGHER EFFICIENCY AND PRODUCTIVITY

Automated pallet wrappers can wrap up to 200 pallets per hour to keep up with the fastest production lines.
Even if your output is lower, automated wrapping can significantly reduce the time taken to wrap each pallet while using less film to wrap the pallet securely and professionally, saving you money.

It also requires no operator intervention so your staff can be more productively deployed.

2. IMPROVED SAFETY

Measures can be taken to isolate stretch wrap machine operation with proper guarding devices and enclosures such as fixed fencing and automated barrier doors.
This makes it a safer working environment for employees as well as fork lift drivers.

Also, when compared with manual pallet wrapping, back strains and other injuries are eliminated with automatic pallet wrapping.

3. REPORTING

Finally, and importantly, an automated solution can be networked to an integrated line control and/or warehouse management solution, and finished goods reporting can be completely automated for real-time reports.

Furthermore, an automated SSCC (serial shipping container code) pallet labelling solution can also be integrated with a fully automatic pallet wrapper.

So... are you ready **to automate?**

Now that we know the key benefits of pallet wrapping automation, how do companies decide if they are ready to automate?

Here are three factors that can build a case for an automated solution.

1. Current and anticipated output:

If you have over 10 pallets a day and are planning to increase production, you could potentially see return on investment in a year or so.

2. Spend on consumables like film:

You can achieve an average of 250% or more pre-stretch on your films with an automated wrapper, leading to significant saving on film costs alone.

3. Cost of damaged goods:

Hand wrapped pallets are inconsistent and can cause product damage, costing you money. Monitoring how much damaged goods in loading and transport is costing can help build a case for automated pallet wrapping.

Not yet convinced automation is the way to go? Consider:

ACCURACY | REPEATABILITY | QUALITY

Exceptional business performance for most process manufacturers relates closely to achieving operational excellence (OpX). Achievement of true OpX requires continuous improvements through ongoing change. Automation can facilitate that change.

Calculating the **ROI savings**

The main elements of cost include:

COST OF LABOUR

Generally two people are needed for wrapping pallets manually. If the volume of pallets increases, more people are needed, or fewer people are subject to strain injuries.

Fully automatic stretch wrappers do not require any labour input, with the possible exception of loading rolls of film, perhaps 2 or 3 times per day, dependent on production rates.

COST OF FILM

The amount of film used per pallet is least in fully automatic wrapping solutions because of pre-stretch.

A FASW solution, using a typical amount of pre-stretch is expected to use approximately 55-70% less film than manual wrapping.

COST OF DAMAGED PRODUCT

The safest and most professional pallet wrapping is achieved by automated solutions that calculate the wrap and containment force needed to securely wrap the pallets.

In most cases, the volume of pallets determines the return on investment.

So how many pallets do you wrap per hour? For ease of calculation, let's assume 20.

If you operate 10 hrs a day, 5 days a week, 50 weeks in the year, you are wrapping 50,000 pallets a year.

If you use 40% less film, significant savings can be made.

If you reduce your damaged product by even as little as 0.5%, that's 250 pallets of product per year that doesn't end up wasted, with significant financial savings and customer satisfaction implications.

Below is an example of film savings (only film):

• Not optimised film weight	420g
• Optimised film weight	250g (-40%)
• Film saving per pallet	170g
• Film cost $/Kg	3
• Savings per pallet	$.51
• Savings per 50,000 pallet	~ $25,500

→ The total savings are determined by the labour cost + film cost + less damaged product.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The Robopac advantage
Cube Technology™

Not all automatic stretch wrappers are created equal.

Here are the top 6 reasons the Robopac stretch wrapper is the right choice for your production line:

CUBE™ TECHNOLOGY

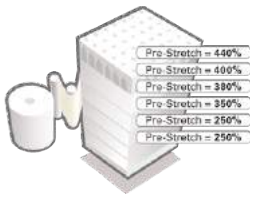
1. Superior CUBE technology

The goal of Cube Technology is to correctly wrap your loads and ensure that they reach your customer in as-made condition.

To achieve this, Cube Technology addresses four key factors required to successfully wrap your load:

- multi-level variable pre-stretch
- strategic film placement
- multi-level variable containment force
- 'protective corner' compensation, eliminating the need for corner posts.

Each of these factors protect your product most effectively while using 30 to 50% less film – both a financial and an environmental benefit.



MULTI-LEVEL VARIABLE PRE-STRETCH

STRATEGIC FILM PLACEMENT

MULTI-LEVEL VARIABLE CONTAINMENT FORCE

'PROTECTIVE' CORNER COMPENSATION

2. RANGE OF PALLET WRAPPING SOLUTIONS

Your product range, palletiser type and line configuration determine the type of automatic stretch wrapping solution you will need.

Foodmach brings to Australia the complete range of turntable, rotary arm and ring style pallet wrappers to suit all types of pallet loads and speeds.

3. INTEGRATION WITH OTHER PACKAGING EQUIPMENT

Foodmach ensures that Robopac pallet wrappers work with your existing palletising line, with the new wrapping machines set up and programmed to run optimally with your existing automation.

4. SPEED

Robopac keeps up with the fastest moving FMCG lines stretch-wrapping pallets at up to 200 pallets per hour.

5. SUPPORT

With Foodmach's extensive support network locally in Australia and Robopac's global experience and technology leadership, your pallet wrapper will be supported 100%.

6. PRECISION TESTING

Finally, Robopac has a dedicated test laboratory to confirm the optimum wrapping process for your pallets of products.

With factors such as film type, amount of pre-stretch, number of wraps, variation in wraps and the amount of pre-stretch in various locations, this service ensures you obtain the best load stability without excessive use of film or time, saving you money.

Wrap Up

Each application is unique based on the needs of the site.
The key takeaways are:

KNOWLEDGE

Know the details of the application and invest some time in evaluating all the technology options available.

INVESTMENT

An investment in the right pallet wrapping technology can improve efficiency, productivity and streamline operations.

ROI

Calculate the ROI of the equipment including the reduction in damaged product as well as the site safety implications.

WHAT CAN WE DO FOR YOU?

PALLETISING

Our Award-winning Range

Robomatrix® High Speed

Compact Robomatrix®

Pick & Place

Robot Pick & Place Depalletiser

Mechanical High Level Depalletiser

Mechanical Low Level Depalletiser

CONVEYING

The latest in conveyor technologies, custom-built to handle any type of product or packaging:

Container Conveying (PET bottles, glass and cans)

Case & Tray Conveying (cartons, multi-packs, shrink-packs, open trays)

Pallet Conveying

ENGINEERING & PROJECTS

Engineering Diagnostics & Design

System Design 3D Simulation

Automation & Control Systems

Equipment Manufacture

Installation & Commissioning (mechanical, electrical & software)

Total Project Management

Line Efficiency Audits

PACKAGING TECHNOLOGIES

Inspection Systems

Collaborative Robots

Conventional Robots

Fillers

Labelling and Coding

Case Packers

Pallet Wrappers

SAFETY

Risk Assessments

Safety Upgrades

Compliance

Reporting

CUSTOMER SUPPORT

Maintenance Support (major service, system audit, robotics)

Operator & Maintenance Training

Remote Phone Support

Spare Parts Service

24/7 Support Programs (mechanical, electrical & software)

LINE INTEGRATION

Industry 4.0

Systems Integration

Line Control

Line MES

RELOCATION SERVICES

Factory

Equipment

End to End Service

CONTACT US

Tel: 1800 FOODMACH

Melbourne
15/19 Enterprise Drv, Bundoora VIC 3083
melbourne@foodmach.com.au

Sydney
sydney@foodmach.com.au

Brisbane
brisbane@foodmach.com.au

Adelaide
adelaide@foodmach.com.au

Echuca
1 Darling St, Echuca VIC 3564
echuca@foodmach.com.au

www.foodmach.com.au

At Foodmach, our challenge is to put you behind the wheel of the fastest, most powerful production line solution possible.

One that gives you real-time information and gets you to the finish line first. We guarantee you speed – speed of service and delivery because we're local manufacturers and do everything in-house, and higher operational speeds through better technology tailored to your exact requirements.

And we guarantee control – better project management control through a single point of contact and better machine control through the industry's most user-focused operation and software solutions. We integrate all the equipment on your line and give you more live data than ever before.

Control over operational safety too, because we're the safety experts and we make the safest machines in the business. We'll even relocate your entire factory and get you safety compliant.

Foodmach is **the fastest way to get control of your packaging line.**

speed + control | ability