Επίσημος Αντιπρόσωπος:

CFS INDUSTRIAL FOOD SYSTEMS

GEA

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We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 index.

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GEA Packaging Guide

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GEA Packaging Guide

engineering for a better world

Content

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OUR COMPANY

GEA is one of the largest suppliers of process technology for the food industry and for a wide range of other industries. As an international technology group, the company focuses on world-leading process technology and components for sophisticated production processes. GEA takes you forward with performance-focused solutions, from single machines to complete production lines for the preparation, marination, processing, slicing and packaging of primarily meat, poultry, fish, seafood, confectionery, lettuce, fresh and frozen vegetables and cheese-based products. Our equipment helps you meet today's operational challenges such as product variety, process flexibility, uptime, reducing the cost per kilogram and per pack, food safety and the environment.

GEA has a particularly long and rich history in packaging equipment. This heritage starts in 1936, when Krämer+Grebe was founded in Germany and rapidly became a pioneer in the meat processing industry. By the sixties, the company's Tiromat branded thermoformers were earning a strong reputation in the rapidly developing market for pre-packaged foods. These machines laid the foundations for today's GEA PowerPak range of horizontal form-, fill- and seal thermoformers for packaging sliced, processed, fresh and portioned food products.

Meanwhile in the Netherlands in the fifties, Aquarius was making a name for itself with machines for the lollipop industry and soon added vertical form-, fill- and seal machines to the range. These machines have evolved into the GEA SmartPacker family of baggers. Today, these ultra-reliable machines are used for packaging meat, fish, seafood, vegetables, potatoes, fruit, snacks, salad, cheese, confectionery and more. GEA can also supply complete line solutions for packaging a huge variety of products.

Packing equipment

Today's packaging product range includes:

- Horizontal form-, fill- and seal machines (thermoformers)
- Vertical form-fill- and seal machines (baggers)
- Labeling and printing solutions
- Loading and handling equipment

In addition, GEA has become an authority on packaging types, bag formats and reclosability

From preparation to packaging

In addition to the packaging equipment, GEA also supplies:

- Preparation equipment (mixers, grinders, bowl cutters, emulsifiers, fat analyzers)
- Marination equipment (injectors, tumblers, massagers, tenderizers, defrosters)
- Processing equipment (formers, coaters, fryers, cookers, grills)
- Slicing equipment (slicers, loaders)

AN INTRODUCTION TO PACKAGING

The twentieth century witnessed a major shift in eating habits as processed and packaged foods gained popularity alongside fresh products. Mankind has been processing food to extend its shelf life for centuries (examples include salted and dried meats), but as new techniques were developed to manufacture ready-to-eat and ready-to-cook foods, a growing need emerged for individual product packaging. In the same period, supermarkets started to appear where customers selected products from shelves instead of being personally served. These trends were driving forces for automated food packaging technology, an industry that kicked off in the fifties.

A brief history of food packaging

Early man consumed food where it was found, so there was little need to contain or transport it. However, with the development of agriculture and communities living in permanent settlements instead of nomadically chasing food sources, the first 'food packaging' emerged. The early forms of packaging were made from natural materials like grass and reed woven into baskets, and it took until 8,000 years ago before ceramic containers first appeared in the Middle East. Tomb evidences shows the Egyptians used wooden boxes, crates and barrels for bulk food packaging 5,000 years ago, and the invention of the pottery wheel some 1500 years later heralded the emergence of mass-produced pottery. Around 300 BC, the Phoenicians and Syrians were blowing round glass containers, and around the same time, a paper-like material made from cellulose fibers was used in China as 'flexible' food packaging.

Modern packaging developments

The last 1,000 years has seen many changes and advances in packaging as a result of social change and technological progress. The expansion of international trade played a part, but the most significant developments in modern packaging technology have taken place since 1800.

Milestones in modern food packaging

- Glass jars - 300BC
- Paper bags - 1400
- Metal cans – 1800
- Styrene foam – 1930 –1950
- Aluminium foil containers – 1950
- Aluminium can – 1957
- Cellulose packaging – 1950
- Heat shrinkable plastic films – 1958
- PET (polyethylene terephthalate) containers – 1977

Glass jars

Although glass-making was first industrialized in Egypt in 1500 BC and the Phoenicians made bottlelike glass containers 1200 years later, it took until the 17th century AD when the split mold was invented before irregular shapes could be easily produced. As production techniques further improve in the next two centuries, the price of glass containers gradually decreased. After the invention of an automatic rotary bottle-making machine in 1889, glass containers finally became economically viable for consumer products.

Paper bags

The use of flexible packaging materials began with the Chinese, who also developed the techniques for paper making. This knowledge gradually moved west into Europe around the 14th century AD. Commercial paper bags were first manufactured in 1844 in Bristol, England, and eight years later, Francis Wolle invented a bag-making machine in the United States. The technology evolved to include glued paper sacks, the gusset design (still used today) and in-line printed bags.

Metal cans

Canning preserves food by sealing it in an airtight container. As in many technological innovations, the military played a role in the development of canning. During the Napoleonic Wars, the French government offered a 12,000 Franc reward to devise a cheap and effective way to preserve food as armies on the march require regular supplies. So in 1809, French chef and confectioner Nicolas Appert observed that food cooked inside a jar did not spoil unless the seals leaked. He won the prize, and a year later the concept was improved as glass jars were replaced with cylindrical tin or wrought-iron canisters (hence 'cans'). By the mid-19th century, canned food had become a status symbol for wealthier households. Today, tin-coated steel is the material most commonly used for cans, although the use of aluminum began in 1957 and now dominates for beverage cans.

Paper cartons

Another important use of paper in packaging was the development of paperboard as used for cereal boxes. The first 'cardboard' box was produced in England in 1817, although the USA-based Kellogg company was first to use cereal cartons. The original packaging had a waxed, heat-sealed bag wrapped around the outside of a plain box, whereas today, a plastic liner protects cereals inside the printed carton. Another form of cardboard based on corrugated paper appeared in the 1850s. Comprising thin sheets of paperboard formed into a wavy shape and then sandwiched between two flat sheets of paperboard, it is typically used for bulk packaging. Paper and paperboard packaging increased in popularity throughout the 20th century. Then with the advent of plastics in packaging (late 1970s and early 1980s), paper was replaced for many applications.

Plastics

Plastic is far newer than metal, glass, and paper. Although discovered in the 19th century, plastics were initially used for military purpose. A wide variety of plastics have been developed over the past 180 years, including Styrene in 1831, Vinyl Chloride in 1835, and Celluloid in the late 1860s. However, none of these materials were used for packaging until the twentieth century. Early Styrene products, for example, were brittle and shattered easily, but by the 1950s Polystyrene foam was available for boxes, cups and meat trays for the food industry.

Celluloid was invented by the Hyatt brothers and first used as an ivory substitute. It could not be molded, but was carved and shaped. Cellulose acetate was initially developed for photographic uses in 1909, and although DuPont introduced Cellophane in 1924, it wasn't commercially used for packaging until the late 1950s.

Vinyl Chloride was first used for molded squeeze bottles in 1947 and ten years later, heat shrinkable films were developed from blending styrene with synthetic rubber.

One of the most commonly used packaging plastics is Polyethylene Terephthalate (PET or PETE). This material became available for beverage containers in 1977. A few years later, foods and other hot-fill products such as jams were also packaged in it. Today, non-oriented PET sheet is thermoformed to make packaging trays and blisters. If crystallizable PET is used, the trays can be used for frozen oven-ready meals, since they withstand both freezing and oven baking temperatures. Other plastics used for packaging include High Density Polyethylene (HDPE) for personal care products, Low Density Polyethylene (LDPE) for plastic food wrap and frozen food bags, and Polypropylene (PP) for food storage containers.

Overview of plastic resins (polymers) commonly used for packaging:

1. Polyethylene Terephthalate, PET
2. High Density Polyethylene, HDPE
3. Low Density Polyethylene, LDPE
4. Polypropylene, PP
5. Polystyrene, PS
6. Polyamide, PA

THE FIVE FACTORS OF PACKAGING

Food is packaged to:

- **CONTAIN** – portion control, hold small items together, for example in a can, jar, bottle, bag, vacuum formed tray, pre-formed tray, etc.
- **PROTECT** – prevent spoilage, leakage, breakage, dehydration, contamination, theft and tampering. Physical protection – against shock, vibration, compression, temperature, etc. Barrier protection – a barrier against oxygen, water vapor, dust, bacteria, etc.
- **INFORM** – identify product, explain how it should be used or prepared, warn about hazards of misuse, list ingredients, provide nutritional data and pricing, etc.
- **PROMOTE** – a marketing tool to help differentiate from similar products and attract attention in retail and supermarket outlets, for example by using brands, colors, illustrations and shapes.
- **TRANSPORT** – make it easier and safer to move products from the manufacturer to the warehouse and retailer (tertiary packaging) and consumer (primary packaging).

Promotion on packaging is more effective than advertising

As the retail food business has almost completely moved from small grocers, butcher's and other specialized shops to self-service supermarkets, the need to inform and sell a product via the packaging has grown enormously. With around 10,000 products available in a typical supermarket, it is difficult to stand out from the crowd. Research shows that investments in packaging often bring higher returns than traditional advertising!

What drives the processed food industry?

The processed food industry and food package and designs follows social and economic trends in the world.

Trends in processed foods:

- Health (nutrition, low fat, sugar free, etc.)
- Novelty (foreign and trendy products)
- Lifestyle (complete meals, ready-to-heat)
- Socio-economic (recession, population growth)
- Reconstitution (fry, oven, microwave)
- Cost efficiency

Trends influencing packaging design:

- Convenience (resealable, easy to open, portion size)
- Economy (bulk sizes, various qualities)
- Marketing (visibility, identity)
- Labeling (contents, directions, legislation)
- Sustainability (reduced, reusable, recyclable)

Packing categories

Packaging is typically described in relation to the type of product being packaged, for example retail food, catering food, medical devices, pharmaceuticals, etc. It can also be categorized by layer/ function, or by its rigidity.

Primary, secondary and tertiary packaging

It is convenient to categorize packages by layer or function:

- **PRIMARY PACKAGING** – the material that first envelops the product and is in direct contact with the contents. This is the main application area for GEA packaging machines.
- **SECONDARY PACKAGING** – is outside the primary packaging, often used to group primary packages together. Cardboard sleeves and film wrappers around the primary packaging are examples of secondary packaging.
- **TERTIARY PACKAGING** – is used for bulk handling, warehouse storage and transport shipping. The most common form is a palletized unit that packs into containers.

These broad categories are arbitrary. For example, depending on the use, a shrink wrap can be primary packaging when applied directly to the product, secondary packaging when bundling smaller packages, and tertiary packaging on some palletized distribution packs!

GEA PowerPak thermoforming, GEA TwinStar traysealing machines and GEA SmartPacker vertical packaging machines are mainly used for primary packaging (packaging material is in contact with the contents) and secondary packaging.

GEA SOLUTIONS FOR BAGS, TRAYS AND VACUUM PACKS

GEA has the know how and expertise to give you a headstart by providing a total package for fresh and frozen food, confectionery, non-food and medical packaging. Over the years we have installed many complete lines in all corners of the world, and all have been developed hand-in-hand with the customer. Naturally, our total solution approach extends to complete systems with all peripheral equipment such as transport, labeling and printing. We help you keep products fresher for longer, take care of lowest cost per pack and provide visually appealing packages to win attention in supermarkets and other outlets.

GEA VERTICAL PACKAGING SOLUTIONS

A variety of bags, with a wide range of options can be made on our equipment. Depending on your needs you can select the type that suits your product and customer best. On the next pages we will explain how these bags are made.

HOW BAGS ARE MADE

Working principle

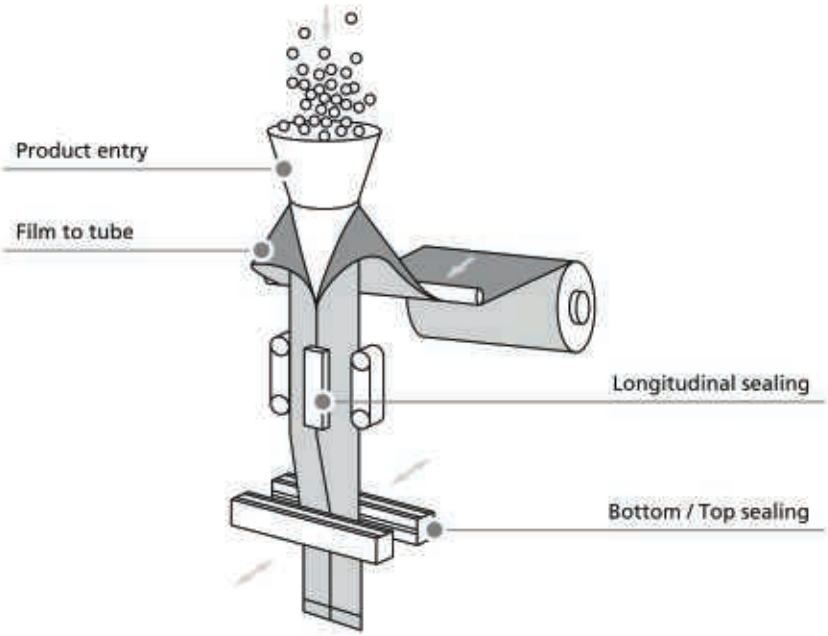
The typical machine is loaded with a flat roll of plastic film, which has artwork applied to the exterior or interior of the film.

The film approaches the back of a long cylindrical tube, which is called the forming tube. When the center of the plastic is near the tube, the outer edges of the film form flaps that wrap around the conical forming tube. The film is pulled downward around the outside of the tube and a vertical heat-sealing bar clamps onto the edges of the film, bonding the film by melting the seam edges together.

To start the bagging process, a horizontal sealing bar clamps across the bottom edge of the tube, bonding the film together, and cutting off any film below. This sealing bar can be at a fixed height, which is called an intermittent sealing process. Faster systems include a sealing bar that moves down with the bag while sealing. This is called a continuous process. When the gross weight of the product-filled bag is reached, filling stops, and the horizontal sealing bar seals the top of the bag, simultaneously forming the bottom of the next bag above. This bag is then cut off from the tube and is now a sealed package, ready to advance onward into the product boxing and shipping processes.

The feeding of material and cutting of the bag can be determined either by bag length, or by indexing to an eyespot, which is detected by a visual sensor.

Many food filled packages are filled with nitrogen to extend shelf life. Food manufacturers are often looking for ways to improve their geographical reach or otherwise extend the shelf life of their product without the use of chemicals. Nitrogen filling is a natural means of extending shelf life.



Process steps

Step 1: Product enters through the forming tube

Step 2: Rollers guide film to forming shoulder

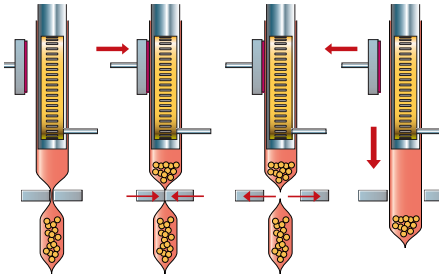
Step 3: Forming shoulder shapes flat film into round tube

Step 4: Longitudinal edges of the film are sealed, bonding the film together

Step 5: Tube is cross sealed so bottom/top is made

GEA SmartPacker SX, intermittent motion

The product falls onto the closed jaws. The jaws open and the vacuum belts transport the film through the open jaws. When the right bag length is reached, the jaws close and film is sealed and cut. The cycle continues as the jaws open again to release the sealed bag.



Technical details:

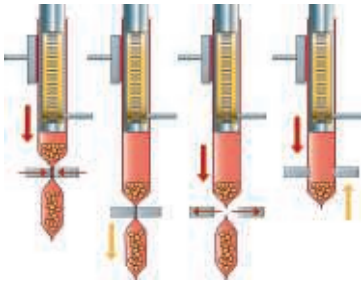
- bag widths of min 70 max 400 mm.
- bag length max 550 mm.
- max speed is up to 100 bags per minute

GEA SmartPacker CX, continuous motion

The product falls onto the closed jaws. As the bag fills, the downward movement of the jaws is synchronized with the film transport and the film is sealed and cut. The jaws open to release the sealed bag and return to the top to form the next bag.

GEA SmartPacker TwinTube

This uses the same technology as the CX, but executed with a double set of tubes next to each other, so twice the speed. It is ideal for calorie and similar bag formats.



Technical details:

- bag widths of min 70 max 400 mm.
- bag length max 550 mm.
- max speed is up to 250 bags per minute

GEA SmartPacker CX 400

GEA SmartPacker CX250

A VARIETY OF WELDING/HEAT SEALING SYSTEMS

GEA can offer a comprehensive choice of sealing options to suit a wide variety of packaging film types.

GEA Heat seal technology

This system heats the jaws continuously for optimal temperature control, so allowing for the back and front jaws to be adjusted independently. Jaws are available with different serration types and optional euro, longitudonal or punch hole.

GEA Ultrasonic seal technology

Ultrasonic sealing of bags uses high-frequency 'ultrasonic' vibrations of the sonotrode to bond the two layers of film together at a molecular level. Even if moisture or small particles of debris remain in the sealing area, an airthight seal is still possible. GEA has a patent pending technology to seal film 30- micron OPP film that delivers consistent results.

GEA Induction seal technology

Induction sealing uses an indirect way to heat the sealing wires. This system requires no heating-up time and maintains a constant temperature over the full length of the sealing wires. This superior, patent pending, induction technology simplifies the sealing concept and therefore reduces downtime.

DIFFERENT BAG STYLES

The GEA SmartPacker offers an extensive choice of bag formats directly from the reel. With these different formats, from standard flat pillow bags to more complex quatroseal or zipper bags, GEA offers a packaging solution that is right for each product.

Pillow

Characteristics

- Most common bag style
- Simple to produce
- High speeds possible

Gusset

Characteristics

- Pillow bag with side gussets
- Gusset is considered to be the depth of the bag
- Suitable for "bag-in-box" solution

Blockbottom

Characteristics

- Side gusseted bag
- Cost-effective stand-up format
- Good appearance on the shelf

Quatroseal

Characteristics

- Flat bottom
- Stand-up pouch with 4 corner seals
- Attractive on the shelf
- Maximum promotional effect

Doystyle

Characteristics

- Excellent facing
- Popular bag style
- Large printing surface
- Replaces pre-made bags

Envelope

Characteristics

- Bag with re-sealable flap
- Double-sided adhesive tape

The choice of bag style depends on:

- **Customer perception/market segment** – for example, is it a high-end luxury product or budget supermarket product? Some formats have a high-quality appearance, while others are better for applications where price is the main driver.
- **Product characteristics** – whether the products are fresh, frozen, grated, moist, wet, fragile and so on also influences the choice of bag format, sealing technique and material.
- **Volume/weight combination** – some bag formats are able to hold larger volumes or support more weight than others.
- **Shop presentation** – formats with a flat base can be used for stand-up presentation on shelves and in upright freezers whereas other are intended for lying in a chest-type cooling- or freezer cabinet. All formats are suitable for hanging presentation (Euro punch or longitudinal hole).
- **Modified Atmosphere Packaging (MAP)** – the requirement to inject a gas (such as O_2, N_2 or CO_2 to increase shelf life) into a bag influences the choice of bag format, sealing technique and material.
- **Convenience** – additional features are available on most formats to make the bag more convenient for consumers, such as reclosable zipper, reclosable tape, and easy-tear opening.

BAG SELECTOR

	Pillow	Gusset	Blockbottom	Envelope	Quatro	Doystyle
Protein	●		●	●	●	●
Frozen (vegetables/French fries)	●		●		●	●
Fresh (salad/cheese)	●		●	● cheese only	●	● cheese only
Confectionery	●	●	●	●	●	●

● available as standard

DIFFERENT BAG OPTIONS

Reclosable zipper

Europunch

Perforation

Easy-tear

Label

Reclosable tape

Print

Modified Atmospere Packaging

GEA HORIZONTAL PACKAGING SOLUTIONS

GEA Vacuum packs

These give excellent product presentation with long shelf life and low material use. Opening features such as Peel corners, tear off cutting and even reclosable packs with Zipper application are available.

GEA Trays

A formed tray is an excellent solution to pack products in a transparent pack (MAP) or a skinpack. Any MAP application can be combined with peel easy opening features or even re-closable function.

HOW THERMOFORMED PACKS ARE MADE

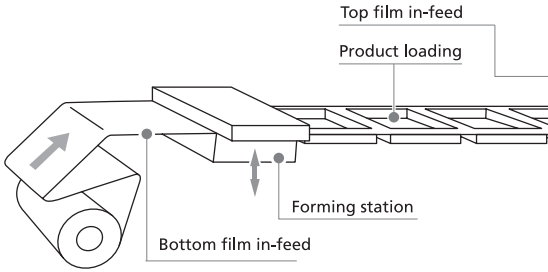
Working principle

- Bottom film is fed into the transport chains.
- Film is heated in the pre-heater or forming lid heater.
- Film is formed into the forming mold by use of vacuum and / or compressed air and / or Optiform plug-assist.
- Trays are getting filled with product.
- Top film is supplied into the sealing station.
- Tray with product gets evacuated through narrow top film, side holes or cross nozzle bar, optionally modified atmosphere is applied and the pack is sealed.
- Optionally packs are labeled in the labeling station.
- Packs are cut, either by cross cut guillotine for flexible film or by cross cut punch for rigid film.
- Longitudinal cut is executed by rotating knives or squeeze knives for rigid as well as flexible film or roller shear cut system.
- Packs are leaving the machine on the out feed conveyor, while side waste gets removed.

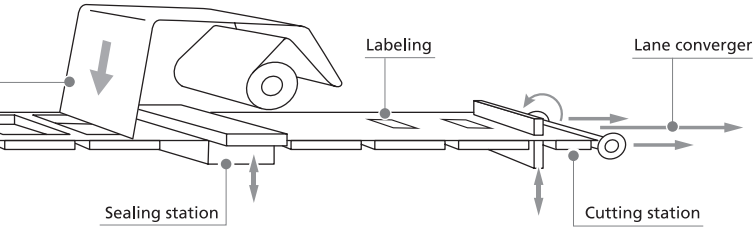
The result is a high quality pack which meets the GEA standard expected by all GEA PowerPak thermoformers.

HOW PACKS ARE MADE

Working principle



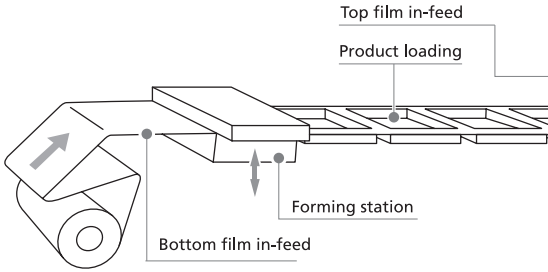
Infeed section	Forming stations	Filling section	Sealing station
GEA AIR/BLISTER pack			
Index film	> Heat film > Form film	Fill product	> Seal films
GEA VACUUM pack			
Index film	> Heat film > Form film	Fill product	> Vacuumize > Seal films > Ventilate
GEA SKIN pack			
Index film	Heat film > Form film	Fill product	Delayed vacuumize product > Heat topfilm > Seal films > Ventilate top prior to bottom
GEA MAP pack			
Index film	> Heat film > Form film	Fill product	> Vacuumize > Refill gas > Seal films > Ventilate



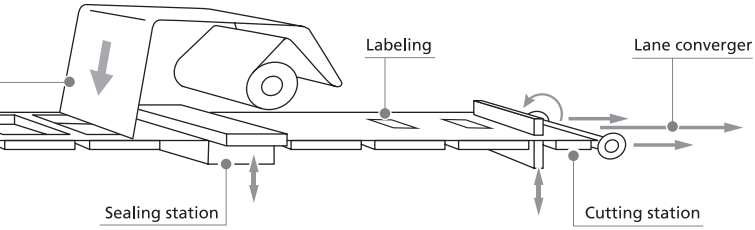
Labeling station	Cutting station	Lane converger	After treatment	End
Production / Expiring Date Traceability	Cut pack	Re-format		Sell
Production / Expiring Date Traceability	Cut pack	Re-format		Sell
Production / Expiring Date Traceability	Cut pack	Re-format		Sell
Production / Expiring Date Traceability	Cut pack	Re-format		Sell

HOW PACKS ARE MADE

Working principle



Infeed section	Forming stations	Filling section	Sealing station
GEA SHRINK pack			
Index film	> Heat film > Form film	Fill product	> Vacuumize > Optionally MAP > Seal films > Ventilate
GEA STEAM EVACUATION pack			
Index film	Heat film > Form film	Fill product	> Inject/flush steam > Seal films
GEA COOK-IN-PACK			
Index film	Heat film > Form film	Fill product	> Inject/flush steam > Seal films
			ALTERNATIVELY: > Vacuumize > Seal films > Ventilate
GEA TiroBox			
Index film	Heat film > Insert cardboard tray > Form into tray > Seal film to tray	Fill product	> Vacuumize > Refill gas > Seal films > Ventilate



Labeling station	Cutting station	Lane converger	After treatment	End
Production / Expiring Date Traceability	Cut pack	Re-format	Shockheat pack	Sell
Production / Expiring Date Traceability	Cut pack	Re-format		Sell
Production / Expiring Date Traceability	Cut pack	Re-format	Cook pack	Sell
Production / Expiring Date Traceability	Cut pack	Re-format	Cook pack	Sell
Production / Expiring Date Traceability	Cut pack	Re-format		Sell

GEA Air/Blister pack

An Air/Blister pack is a pack which contains a product and is sealed only. There is the option to evacuate the pack slightly.

Arguments for using GEA Air/Blister pack application

- Protection
- Hygiene (sterilization)
- Easy handling
- Theft prevention for smaller items

Applications for GEA Air/Blister pack:

- Medical disposables
- Non-food products
- Frozen food products

Medical disposables

Consumer products

Poultry

Infusion bags

Toothbrushes

Ready meals

GEA Vacuum pack

A Vacuum pack is an airtight pack. All the air is removed from the pack before sealing. When ventilated the film covers the product completely.

Arguments for using GEA Vacuum pack application

- Long shelf life
- Economical packaging with clear product presentation

Applications for GEA Vacuum pack:

- Meat (ham, sausage, poultry, marinated ribs, sate)
- Cheese (blocks, sticks, slices)
- Seafood (fish fillets, smoked, marinated fish)
- Frozen food (pastry, dough)
- Ready meals (potato, vegetables)

Salami

Vegetable aspic

Pre-cooked potatoes

Cheese

Sausages

Surimi

GEA Skin pack

A Skin pack in principle is a vacuum pack. The heated top film is put over the product, this process effectively covers the product with a "second" skin and generates a fusion seal around the product.

Arguments for using GEA Skin pack application

- Excellent shelf life
- Attractive presentation

Applications for GEA Skin pack:

- High quality sliced products (meat, cheese, fish)
- Meat cuts / sausages (fresh / cooked / roasted)
- Fish cuts (fresh / cooked / roasted)
- Hard cheese
- High-end products (e.g. top quality seafood, scallops)

The product gets a very nice presentation as if it is just lying on a plate or in a tray.

Beef

Seafood

Turkey

Spanish pork

Salmon

Duck

GEA MAP pack

A MAP pack is a Modified Atmosphere Pack, in which the air is first pulled out of the pack. After this vacuuming process a pre-defined gas-mix is added and the pack is sealed.

Arguments for using GEA MAP pack application

- Fresh image of product presentation
- Extension of shelf life
- Convenient handling of final product

Applications for GEA MAP pack:

- Meat / sausages / minced meat
- Fish cuts
- Cheese / sliced products
- Ready meals / pasta
- Vegetables / fruits / nuts
- Bread / pastry

Cheese

Hotdogs

Pizza

Salami

Case ready

Pastry

GEA Shrink pack

A Shrink pack in principle is a vacuum pack. It is made from special shrinkable top and bottom film. The shrinking effect is obtained by passing the packaged product through a hot air tunnel / waterbed.

Arguments for using GEA Shrink pack application

- Long shelf life
- Attractive wrinkle free
- Allows different product sizes to be packed in one pack size

Applications for GEA Shrink pack:

- Fresh meat / meat parts / marinated meat / sausages
- Whole chicken / chicken parts
- Cheese blocks (to ripen or ready to eat)
- Lamb legs
- Cooked hams

Poultry

Bacon

Cheese block

Sausages

Meat cuts

Cheese

GEA Steam Evacuation pack

Steam Evacuation pack is a vacuum pack where the fresh cooked, roasted or heat-treated product is filled hot. The product can be solid and/or with sauce. When filled, the hot product (preferably at around 85°C) gets steamflushed in the sealing station. The result is a full vacuum pack with optimal shelf life.

Arguments for using GEA Steam Evacuation pack application

- Long shelf life
- Hot product with or without sauce
- Cost saving (no cooling process before packaging)

Applications for GEA Steam Evacuation pack:

- Ready meals with sauce
- Pasta
- Vegetable dishes
- Soups
- Roasted / cooked meat / chicken / chicken parts
- Cooked fish

Pasta

Meatballs

Turkey

GEA Cook-in-pack

A Cook-in-pack is a pack which is filled with a raw material and after being sealed, the product is cooked inside the pack. This is a typical application for the manufacturing of cooked ham.

Arguments for using GEA Cook-in-pack application

- Cost saving
- Enhanced product quality output
- Raw material may vary in size
- Much longer shelf life
- Prevents yield loss

Applications for GEA Cook-in-pack:

- Cooked ham
- Paté
- Fish paté

Cooked ham

D-shaped ham

Paté

GEA TiroBox

TiroBox is a ready-folded cardboard packaging that is lined with a film directly in the packaging machine, then filled and sealed. The pack can be heated in the microwave and is ideally suited for packaging convenience foods or snacks. Consisting of as much as 70 % renewable resources, this kind of packaging meets the trend to use more renewable materials.

Arguments for using GEA TiroBox application

- Ecologically sustainable: after use the cardboard and film are separated for waste disposal
- Machine can be used for the production of TiroBox and also for standard packages

Applications for GEA TiroBox:

- Ready meals
- Noodle snacks
- Rice snacks

OPTIONS FOR TRAYS (in-line)

Easy opening features

Peel corner for easy opening

Peel corner for easy opening

Opening slot

Zig-Zag opening

Chevron peel

Peel flap

Reclosability

FlipFresh with sloped forming

FlipFresh Classic

Press-to-Close zipper

Slider zipper

Click-to-Close reclosability

Adhesive film

OPTIONS FOR TRAYS (in-line)

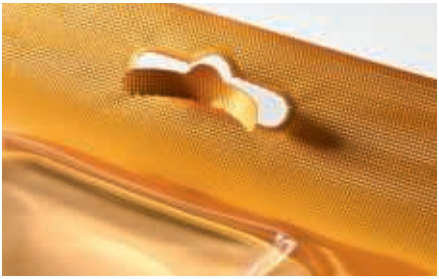
Special cutting features

Special contour cut

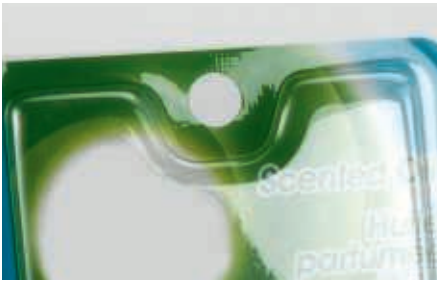
Contour cut

Complete contour cut

Complete contour cut



Euro hole



Round hole

Labelling and printing options

Top web label

Top web label

Bottom web label

Bottom web label

Printing on top film

Printing on label

PRODUCT PRESERVATION

One of the main reasons for packing food products is to protect the product against deterioration and to achieve a time-frame in which the product can get distributed to the retailers while still keeping its freshness as much as possible. It is definitely needed that all the steps and treatments the product has to go through are carefully executed. This routing starts already where the product is cropped / processed and transported to the factory and it ends when the consumer opens the pack. A spoiled product cannot be improved by a pack; it only becomes worse by the time and mistreatment. The influence the pack has on the quality of the product is the possibility to extend its natural shelf life. This extention of natural shelf life can be achieved by evacuating all the environmental air from the pack by creating a vacuum pack, or by using MAP. This MAP packaging should be done in combination with the right films to keep the gases as long as possible inside and the air / microbes outside the pack.

PACKAGING FILMS

Mono-layer

Film made out of one single layer, the base material to make these films can vary, depending on usage and further processing.

Multi-layer

This type of film is made out of structured layers of different materials, the order in which these are used as well as the material can vary depending upon the technical needs and usage.

Film types

To pack a product, there is a very wide range of films available. For vertical packaging mono- and multi-layer films are used, for horizontal packaging multi-layer are applied and split up in two groups, flexible and rigid.

Base materials for most common packaging film-compositions:

- PA Polyamid (body layer)
- PET Polyethylenteraphthalat (Polyester) (body layer)
- PP Polypropylene (body layer and / or sealing layer)
- PE Polyethylene (sealing layer)
- EVOH Ethylen-Vinyl-Alkohol-Copolymer (barrier layer)
- I Ionomer /Surlyn (special sealing layer)
- PS Polystyrene (body layer)

These base materials are used in endless combinations (multi-layer) to suit relevant applications and needs for your product like protection, presentation, information, etc. In the end there are always two items which will decide which film will get applied:

- Is the material the best choice for the product and pack-application?
- Is it the most economical way to fulfill the needs of the pack?

To get the right answer to these questions, a discussion with the film supplier and GEA will be needed.

GASES FOR MAP APPLICATIONS

Mainly three gases are used for MAP packaging:

- Carbon dioxide CO_2
- Nitrogen N_2
- Oxygen O_2

MAP gases are generally used in a mix, from which the composition is strongly dependent on the product to pack. The most commonly used gas mix is a mix of CO_2 and N_2 in a ratio 30% to 70%.

Typical property of the common MAP gases

Carbon dioxide is an active gas. In percentages of 20% or higher in a gas-mix where no O_2 is present, the product will react to this gas: it will slow down the growth of bacteria and mold. At the same time the CO_2 gets absorbed by the fat and water inside the product. A side effect of this process can be that the product gets a slightly acidic taste.

Nitrogen is an inert gas, which means that there is no reaction at all from the product on the presence of this gas inside the pack. It is only used as a filler gas; to fill the pack to a neutral shape after the air is completely evacuated and the pack is refilled with gas. The refilling takes place with the for the product required amount of the active gases CO_2 and / or O_2 and N_2. For some products 100% N_2 is also used as a MAP gas.

Oxygen is a gas which is needed to keep biological life intact. For this reason it is principally not wanted as a gas to extend shelf life of the product, because all the microbes which will deteriorate the food are kept alive too.

For some foods however, a high ratio of O_2 is used to keep the color intact: red beef meat is commonly MAP packed in a gas mix ratio of 80% O_2 and 20% CO_2. A higher ratio of O_2 than the normally ocurring 21% in air (~50%) will turn the microbes overactive and kill them in a short time.

Tips:

- To avoid getting a vacuum pack with a product that strongly absorbs CO_2, the ratio of CO_2 in the gas mix should not be too high. If there is no filler gas present, it is possible that the pack at the end gets a vacuum pack.
- When using O_2 in a higher concentration than outside air (> 21%), a special gas system is needed.
- A considerable expertise on gas, gas mixes and its influence on food products is available at the gas suppliers.

GEA PACKAGING EQUIPMENT

Packaging plays a critical role in attracting attention, and will help convince consumers to choose your products. So at GEA, we help you create package configurations and designs that contribute to sales success. Close contact with our customers for packaging solutions in combination with our extensive experience in equipment for food preparation, marination, processing and slicing give us a unique understanding of the challenges you face. Our innovative machines are also excellent for packaging medical and technical products in well-designed, safe and hygienic packages.

GEA SmartPacker CX400

- Compact, high speed and flexible machine, easy to use
- Creates a wide variety of bag shapes (pillow bags, gusset, block bottom, quatro seal, envelope, doystyle and zipper bags)
- 400 mm maximum bag widths for pillow bags
- Hygienic design with easily exchangeable parts
- Option to combine a ZipTrick system to the machine for recloseable packs

Due to its continuous film transport system, the GEA SmartPacker CX can operate at higher speed than intermittent machines. The GEA SmartPacker offers an excellent price/ performance ratio. Reliable and user-friendly, the machine is easy to operate and clean, while its advanced technical design keeps maintenance costs to a minimum. The GEA vertical packaging machine offers a convenient and inexpensive means of packaging a wide variety of convenience goods, mainly protein, fresh salad, shredded cheese, frozen vegetables, French fries, confectionery and snacks.

In addition, the GEA SmartPacker has an extremely sensitive 'product in seal' detection system, which automatically opens the jaws as soon as an object or product particle is detected – without disrupting production. A major advantage is that contamination or damage of the cross seal jaws and knife is avoided resulting in less downtime and waste.

Your performance benefits

- Higher efficiency and less waste compared with conventional machines
- Consistent high quality of packages produced at up to 120 bags per minute
- Reliable and smooth film transport
- Quick film reel and bag format exchange
- Compact and easy accessible film feed
- Easy to operate, clean and maintain

GEA SmartPacker SX400

- Compact and flexible machine, easy to use
- Creates a wide variety of bag shapes (pillow bags, gusset, block bottom, quatro seal, envelope, doystyle and zipper bags)
- 400 mm maximum bag width for pillow bags
- Maximum bag length 550 mm
- Hygienic design with easily exchangeable parts
- Option to combine a ZipTrick or in-line zip system to the machine for re-closeable packs

Based on an intermittent machine action, the GEA SmartPacker SX has an excellent price/ performance ratio. Reliable and user-friendly, the machine is easy to operate and clean, while its advanced technical design keeps maintenance costs to a minimum. The GEA vertical packaging machines offer a convenient and inexpensive means of packaging a wide variety of convenience goods, mainly protein, fresh salad, shredded cheese, frozen vegetables, French fries, confectionery and snacks.

In addition, the GEA SmartPacker has an extremely sensitive 'product in seal' detection system, which automatically opens the jaws as soon as an object or product particle is detected – without disrupting production. A major advantage is that contamination or damage of the cross seal jaws and knife is avoided resulting in less downtime and waste.

Your performance benefits

- Higher efficiency and less waste compared with conventional machines
- Consistent high quality of produced packages up to 100 bags a minute
- Reliable and smooth film transport
- Quick film reel and bag format exchange
- Compact and easy accessible film feed
- Easy to operate, clean and maintain

GEA SmartPacker CX250

- Super-fast – fills up to 250 bags per minute
- Bag width - 70 to 250 mm
- Large 2500 g bags can be filled
- Lower risk of damaging fragile products during filling

The GEA SmartPacker CX250 configuration can package up to 250 bags per minute – and can handle large format 2500 gram bags. The machine is designed with a considerably low drop from the top funnel to the center jaw, which not only increases capacity and speeds up throughput, but also has benefits for fragile products like hard candy, chocolate, biscuits and cookies.

In addition, the GEA SmartPacker has an extremely sensitive 'product in seal' detection system, which automatically opens the jaws as soon as an object or product particle is detected – without disrupting production. A major advantage is that contamination or damage of the cross seal jaws and knife is avoided resulting in less downtime and waste.

Your performance benefits

- Hygienic design with easily exchangeable parts
- Reliable operation with smooth film transport
- Higher efficiency and low filmwaste
- Easy access to film track from all sides
- Quick film reel and bag format exchange

GEA SmartPacker TwinTube C

- High output up to 500 bags per minute
- Bag width - 50 to 145 mm
- Significantly lower investment than for four high-speed baggers
- Accelerated Return-on-Investment
- Space and cost savings through efficient use of factory space (limited machine height)
- Less operating costs, lower cost per bag
- Flexible packaging (optional to run single reels per tube)

With a bag production output up to 500 bags per minute - up to four times the speed of conventional lines - the GEA SmartPacker TwinTube C high-speed bagging system brings you productivity benefits. The GEA SmartPacker TwinTube C synchronizes two forming tubes on a single machine but offers even more flexibility with the option of running a single film reel for each tube. This allows you to simultaneously run calorie packs with different sizes and appearances.

In addition, the GEA SmartPacker has an extremely sensitive 'product in seal' detection system, which automatically opens the jaws as soon as an object or product particle is detected – without disrupting production. A major advantage is that contamination or damage of the cross seal jaws and knife is avoided resulting in less downtime and waste.

Your performance benefits

- Just 1450 mm high, including metal detector
- Consistent high quality of packages produced at up to 500 bags per minute
- Servo driven unwind shaft
- Two separate film rolls as option
- Unique film control system
- Optimal synchronization with high speed weigher
- Easy access / easy maintenance

GEA PowerPak range

GEA PowerPak: Packed Performance

GEA PowerPak: Functional Performance

GEA PowerPak: Versatile Performance

GEA PowerPak: Peak Performance

GEA PowerPak: Fast, high-productivity for specific application areas

GEA ShrinkPak: One step from film to shrink pack

GEA PowerPak range

The GEA PowerPak range is an innovative thermoformer concept for the highest packaging standards, most complex applications and highest output demands. This machine combines unsurpassed top performance with outstanding cost-saving potential thanks to low machine downtimes. A boost to help you achieve your personal peak performance.

- Long equipment lifetime
- High machine availability: continuous performance monitoring allows you to use the machine to the best of its potential.
- Real-time equipment performance analysis at operator level through GEA CostFox software.
- High cost saving potential depending on application
- Changing of label rolls without stopping the machine.

Flexibility

Design your requirements in consultation with us, and GEA will configure the optimal thermoformer for you. The best of all: this machine is flexible so you do not need to determine a single configuration for its entire life. With the modular construction of the GEA PowerPak range you can build a machine which is uncompromisingly tailored to your applications of today, and still remain open to the demands of tomorrow.

Your performance benefits

- Longer service life
- Reliable quality
- Wide variety of output
- Intuitive operation
- Needs-oriented flexibility
- Useful analysis program

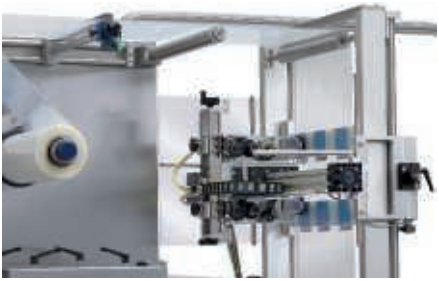
Additional equipment

GEA TiroLabel

The cross web labeler is applying labels to the top or bottom film for a thermorformer application. With its spring loaded finger system the GEA TiroLabel is globally unique.

GEA TiroPrint

GEA offers more integrated printing solutions than any other manufacturer of packaging machines. This means the optimal printer is always available for every job and surface.



GEA PowerGuide

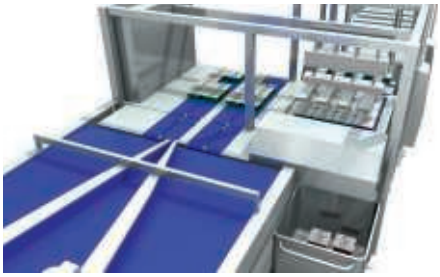
Fully automatic smart outfeed system for interfacing with GEA thermoformers. It assists greatly all line control and puts packs into a single lane with the maximum possible pitching between them. GEA EasyGuide is available for medium-and low capacity.

GEA EasyCheck

Compact checkweighing system with built-in metal detector. It recognizes products with metal decontamination and incorrect weights. This is a complete inspection system in compliance with the modern requirements from HACCP, IFS, BRC and others.

GEA PowerPick

Intelligent outfeed system features automated single pack rejection and ensures accurate single lining of filled packs at the outfeed of the packaging machine. Rejected packs are confirmed and documented for due diligence purposes and the reject collection area is constantly monitored. The outfeed can be configured for single or twin lines.

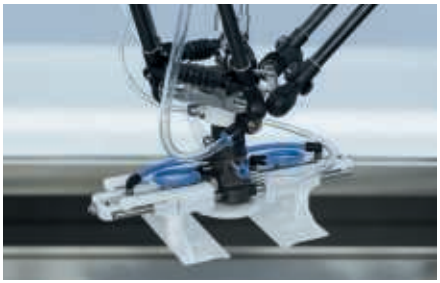


GEA FlexLoader

For fully automated loading of sliced portions and minced meat into thermoformers and traysealers. It provides outstanding flexibility and is quickly changed over to accommodate various formats for the packaging machine.

GEA RobotLoader

The GEA RobotLoader offers outstanding productivity and almost unlimited options for product positioning. To enable customers to meet these requirements as effectively as possible, GEA has developed a fully integrated delta robot system.



A-TO-Z OF PACKAGING TERMINOLOGY

A - C

Aseptic packaging – a technique for creating a shelf-stable container by placing a commercially sterile product into a commercially sterile container in a commercially sterile environment. The sealed container maintains product sterility until the seal is broken.

Back seam – a bag seal that runs down the middle of the back (vertical direction). Made by form-, fill- and seal machines.
Bacon wrapper paper – a greaseproof or vegetable parchment paper or a laminated product made from other materials that are used for wrapping bacon.
Bagger, bagging machine – a vertical form-, fill- and seal machine (such as the GEA SmartPacker) that forms a bag from a roll of flat material, fills it with product and seals the ends.
Barrier – the ability of a material to stop or retard the passage of atmospheric gases, water vapor, and volatile flavor and aroma ingredients. A barrier material is designed to prevent the penetration of water, oils, water vapor, or certain gases. Barrier materials may exclude or retain such elements inside or outside a package.
Base film – or bottom film.
Blister pack – a package type where the item is secured between a pre-formed dome or 'bubble' and a paperboard or flexible carrier. It is also referred to as a bubble pack. The pack may be evacuated slightly. It is often used in medical packaging and other non-food applications.
Blockbottom – a side-gusseted, stand-up bag format.
Bottom film (infeed) – the film roll that forms the bottom part of the pack at the forming station. See also top film.
Bottom/top (or horizontal) seal – the bond between two layers of film made by a heated bar (element) which may also separate the bag from the roll. Bottom sealed bags are separated by a knife.
Breathing package – packaging material that allows air to enter or leave under varying conditions, including temperature changes. Most wrap used for fresh red meat allows enough air to pass through to keep the proper color in the meat.

Carbon dioxide (CO2) – an active gas that slows down growth of bacteria and mold in MAP applications.
Continuous motion packaging – a vertical form-, fill- and seal process in which the horizontal seals are made on the bag as it travels through the machine. This enables it to operate at a greater speed than intermittent motion machines. The GEA SmartPacker CX baggers are continuous motion machines.
Contour cut – a tray specially formed and trimmed to follow the shape of a specific product.
Controlled Atmosphere Packaging (CAP) – a packaging method in which concentrations of gases are maintained throughout storage in order to extend the product's shelf life. Gas may either be evacuated or introduced to achieve the desired atmosphere. See also Modified Atmosphere Packaging.
Cook-in-pack – a unique GEA pack format for products that are packaged raw and then cooked inside the pack, for example, cooked ham and paté.
Cross nozzle bar – a unique GEA vacuumizing and MAP system for the PowerPak's: over cross the film direction between top- and bottom- film, which saves film costs.

D - F

Degradation – a change or break-down in a material's chemical structure.
Dehydration – loss of moisture.
Delamination – separation or splitting of laminate layers caused by poor adhesion or mechanical disruption.
Doystyle – a flat-bottomed bag format that replaces pre-made bags.

Easy-tear – a v-shaped cut-out on the edge of the seal to make it easy to tear open.
Envelope – a reclosable bag format.
Euro hole (or Europunch) – a standardized cut-out (combining a horizontal slot with a central larger diameter hole) at the top of a bag or pouch that allows hanging display. See also longitudinal punch.
EVOH – ethylene-vinyl alcohol is commonly used as an oxygen barrier in food packaging films.
Eyemark or printmark – small, black lines on the edge of the packaging film that are repeated throughout the length of the roll in precisely the same spot in relation to the printed design. They are detected by the machine and indicate when an action is required.

Fin seal – a back seal created when the inside edges of the substrate are bonded, leaving the seam standing out from the package, for example, on potato chip bags.
Flexible packaging – a package, bag, envelopes, pouch, wrap or container made of flexible materials that can be readily changed in shape when filled and closed. Flexible packaging can be single- or multi-layered and is typically supplied on reels.
FlexLoader – a GEA solution for automated loading of portions into a thermoformer or tray sealer.
Flexographic printing – a method of printing using flexible printing plates in which the image to be printed stands out in relief.
FlipFresh – a reclosable lid for trays.
Foam trays – made from expanded polystyrene (EPS) and formed by adding foaming agents to polystyrene and passing it through a die.
Foreign Object Detection (FOD) – a GEA patented system to boost food safety in products packaged on a tray sealer.
Form-, fill- and seal machine – machines that package products by creating packages, such as a bag or tray, fill them with product and then seal the package in one in-line process. The machines can be either vertical (such as the GEA SmartPacker) where the product is dropped into the package before final sealing, or horizontal (such as the GEA PowerPak) where the product is placed into the package horizontally, for example, by a robot loader.
Forming station – the part of the thermoformer where the trays (bottoms of the packs) are drawn into a vacuum forming chamber. See also sealing station.
Forming tube – a long cylindrical tube that guides the flat film from a roll into a tube ready to be made into bags. Each bag format on a vertical form-, fill- and seal machine requires a dedicated forming tube.

G - L

Gas flush – a procedure used in food packaging where gas is used during the packing process to evacuate oxygen and moisture before the package is sealed.
Good Manufacturing Practice (GMP) – implies that the entire manufacturing procedure has been designed in such a way as to produce a quality product that presents a minimum risk to the consumer.
Gusset – a fold in the side or bottom of the pouch, allowing it to expand when contents are inserted

Heat seal technology – the conventional sealing technique that welds two layers of film together using heat.
Hermetic seal – a seal that is airtight or impervious to gases or fluids under normal conditions of handling and storage.
High barrier – a material or package that has very low gas permeability characteristics, and therefore offers a great deal of resistance to the passage of a gas through its volume.

Induction seal technology – a technique that indirectly heats the sealing wires very evenly over the whole length of the seal. It requires fewer wires than conventional heat sealing and is therefore more durable.
In-line process – an industrial process carried out using a line of equipment that continuously processes products without the need to stop and reload.
Intermittent motion packaging – a vertical form-, fill- and seal process in which the horizontal seals are made on the bag while the film tube is temporarily stationery in the machine. This means it operates at a lower speed than continuous motion machines. The GEA SmartPacker SX baggers are intermittent machines.

Jumbo Unwind – an option for unwinding film reels up to 1.000 mm diameter.

Laminated (or multilayer) film – an adhered combination of two or more films or sheets made to improve overall characteristics.
Lap seal – a back seal is made when two layers of substrate overlap, forming a bond with no material standing out from the package.
Line – a row of interconnected processing equipment to form, coat, cook, freeze, and package food products.
Longitudinal (or vertical) seal – the vertical seal formed by bonding the two edges of the film roll together to make a tube. Also known as back seam.
Longitudinal punch – a standardized horizontal slot cut-out at the top of a bag or pouch that allows hanging display. See also Euro hole.
LowDrop – a unique GEA SmartPacker configuration that reduces the distance products travels to reach the bag, and therefore reduces the risk of damage to fragile products during filling.

M - P

MAP – see Modified Atmosphere Packaging.
Modified Atmosphere Packaging (MAP) – a packaging method in which a combination of gases such as oxygen, carbon dioxide and nitrogen is introduced into the package at the time of closure. Purpose is to extend shelf life of the product packaged. See also Controlled Atmosphere packaging.

Nitrogen (N2) – an inert gas used as a filler in MAP applications.

Opening slot – an easy-opening feature for tearing open trays.
OptiChange – the GEA solution for simple and safe tool changing on a thermoformer.
Optiform plug – a plug system in a closed pressure box which allows forming air fill (even while the plug is going down).
Ovenable board – a paperboard that can be placed in a microwave or conventional oven to serve as the cooking utensil for food.
Oxygen (O2) – although oxygen stimulates growth of all biological life, and therefore not used as a gas to extend shelf life, it is sometimes used to preserve the red color of red meat.
Oxygen Transfer Rate (OTR) – a material's barrier abilities against oxygen. This is important in food packaging, as oxygen can decrease shelf life of a product.

PA – polyamide
Packaging – the enclosure of products in a wrap, pouch, bag, box, cup, tray, can, tube, bottle or other container.
PE – polyethylene
Peel corner – an easy-opening feature for removing the top film of trays.
Peel flap – an easy-opening feature for removing the top film of trays.
Perforation – a series of small punched holes to make a package easier to open.
PET – Polyethylene Terephthalate.
Pillow pouch – a bag or pouch in the form of a tube that is sealed at both ends. Pillow type pouches are most commonly produced on vertical form-, fill- and seal machines (such as the GEA SmartPacker) and are characterized by seals across the top and bottom, and a longitudinal seal down one of the faces.
Plastic – collective name for synthetic packaging materials such as styrene, vinyl chloride, PE, PET, etc.
Polyethylene (PE) – a low cost soft flexible material often used as an outer wrap. PE is also used as a sealant layer for laminates, due to its ability to create hermetic seals.
Pouch – a small bag usually constructed by sealing one or two flat sheets along the edges. There is no distinction between a pouch and a sachet other than the common understanding that a sachet is smaller.
PowerGuide – a GEA solution for directing packs into a single lane at the outfeed of a thermoformer.
PowerPak – the GEA range of thermoformers.
PowerPick – a GEA solution for directing packs into a single lane at the outfeed of a thermoformer.
PP – polypropylene
Press-to-close zipper – a reclosable zipper format.

Primary packaging – packaging where the material is in contact with the product being packaged. See also secondary packaging and tertiary packaging.
Product-in-jaw detection – a unique GEA system that ensures the thermal sealing jaws of a GEA SmartPacker do not close when an object is present in the seal area. This prevents sticky products fouling the jaws and therefore causing unnecessary downtime.
PS – polystyrene
Punch hole – a standardized circular cut-out at the top of a bag or pouch that allows hanging display. See also Euro hole.
PVDC – polyvinylidene chloride is used as a coating increasing the barrier properties of the film reducing the permeability of the film to oxygen and flavors and thus extending the shelf life of the food inside the package.

Quatroseal – a flat-bottomed, stand-up pouch with four corner seals.

Ready-to-eat – products that have been fully cooked during processing and only have to be reconstituted (re-heated) by the consumer to eat.
Ready-to-heat – products that have been coated during processes (and may have had the coating flash-fried to harden it) but have not been cooked (still raw). The consumer has to cook the product fully, not just re-heat it.
Reclosable tape – a strip of double-sided adhesive tape that enables a bag to be reclosed after it has been initially opened.
RobotLoader – a GEA solution for automated loading of products into a thermoformer or tray sealer.
Roll stock – any flexible packaging material that is in a roll form.

Seal (or bond) strength – refers to the integrity of a connection between 2 or 3 materials bonded together.
Sealing bar – a horizontal set of jaws that clamp the tube on the vertical form-, fill- and seal machine and use heat (or ultrasonic energy) to make a horizontal seal that forms the bag. On a continuous motion machine, the sealing bar moves down with the film as it passes through the machine, whereas on an intermittent motion machine, it is at a fixed height.
Sealing station – the part of the thermoformer where the trays (bottoms of the packs) are drawn into a vacuum forming chamber. See also forming station.
Secondary packaging – packaging applied outside the primary packaging to group items together. See also primary packaging and tertiary packaging.
Shelf life – used for food products to indicate the effective life of a product from the date of packaging to when it is no longer suitable for consumption. Products beyond their effective date must be removed from inventory shelves because they are likely to be stale.
Shrink pack – a vacuumized pack format that uses film that shrinks to tightly fit the product, delivering an attractive and wrinkle-free result.
Side holes – holes in the bottom film at the chain-sides, to make product vacuumizing and MAP possible.

S - V

Skin pack – an attractive vacuumized GEA pack format that follows the natural shape of the product being packaged like a second skin.
Slider zipper – a reclosable zipper format.
Sonotrode – the ultrasonic jaws that vibrate at a very high frequency to bond two layers of film together.
Stand-up pouch – a flexible pouch design where the bottom portion is gusseted so that it provides a wide base to enable the package to be stood up for display or use. The flat-bottomed Doystyle is an example.
Steam evacuation pack – a GEA pack format for freshly cooked, roasted or heat-treated products that are packed while still hot.
Surface print – a process where ink is deposited directly on the outer surface of the packaging film that is commonly used for short run printing. A UV coating may be added to provide a hard finish that stops the ink flaking or chipping.

Tertiary packaging – packaging used for bulk handling, transport and warehouse storage of packaged products. See also primary packaging and secondary packaging.
Thermoforming – the process of shaping a plastic sheet of packaging film under heat and pressure.
Three-side-seal pouch – a pouch that is formed by folding the web material into a U-shape and then sealing the three open sides. The pouch may be made with a gusseted bottom.
TiroBox – a GEA pack format that uses a pre-folded cardboard packaging that is lined with film in the packaging machine. Foods packaged in this way can be reconstituted in a microwave oven, making it an ideal technique for ready meals.
TiroLabel – the GEA labeling solution for thermoformers or vertical baggers.
TiroPrint – the GEA printing solution for integrating into a thermoformer.
Top film (infeed) – the film that is fed from a roll to form the top or lid of the pack at the sealing station. See also bottom film.
Transverse direction – the direction perpendicular (90 degrees) to the direction a film travels through a machine during processing.
Trays – pre-formed trays for use with a tray sealer (such as the GEA TwinStar) that can be combined with easy-opening features and reclosable techniques.
TwinTube – a unique GEA SmartPacker configuration that produces 2 bags side-by-side, and therefore effectively doubles the maximum achievable speed.

Ultrasonic seal technology – a sealing technique that uses high-frequency vibration of a sonotrode to bond two layers of film together. It is very effective and forms a hermetic seal even if moisture or other debris remains in the seal area after the bag is filled.

Vacuum pack – a pack format for horizontal thermoformers (such as the GEA PowerPak) that offers a long shelf life and is economical with packaging material. Air is removed from the pack prior to sealing.

W - Z

Web – completed packaging material, usually only used to describe the packaging material while still on their roll and before first use.

Zig-zag opening – an easy-opening feature for tearing open trays.
Zipper pouch – a flexible plastic pouch with a molded-in-place sealing device featuring a projecting rib that is inserted into a mating channel to close the pouch. A zipper seal can be repeatedly opened and closed.

Notes

Notes

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