Understand your packaging **process**

A comprehensive guide to choosing materials and printing systems that optimise your packaging line.

Introduction

Choosing the right material and printing system for your product can be challenging. Each packaging line has very specific technical requirements. Not all packaging formats, films, or reels are compatible with every machine, and selecting the wrong option can lead to material waste, sealing issues, production delays, or even affect the quality of the final product.

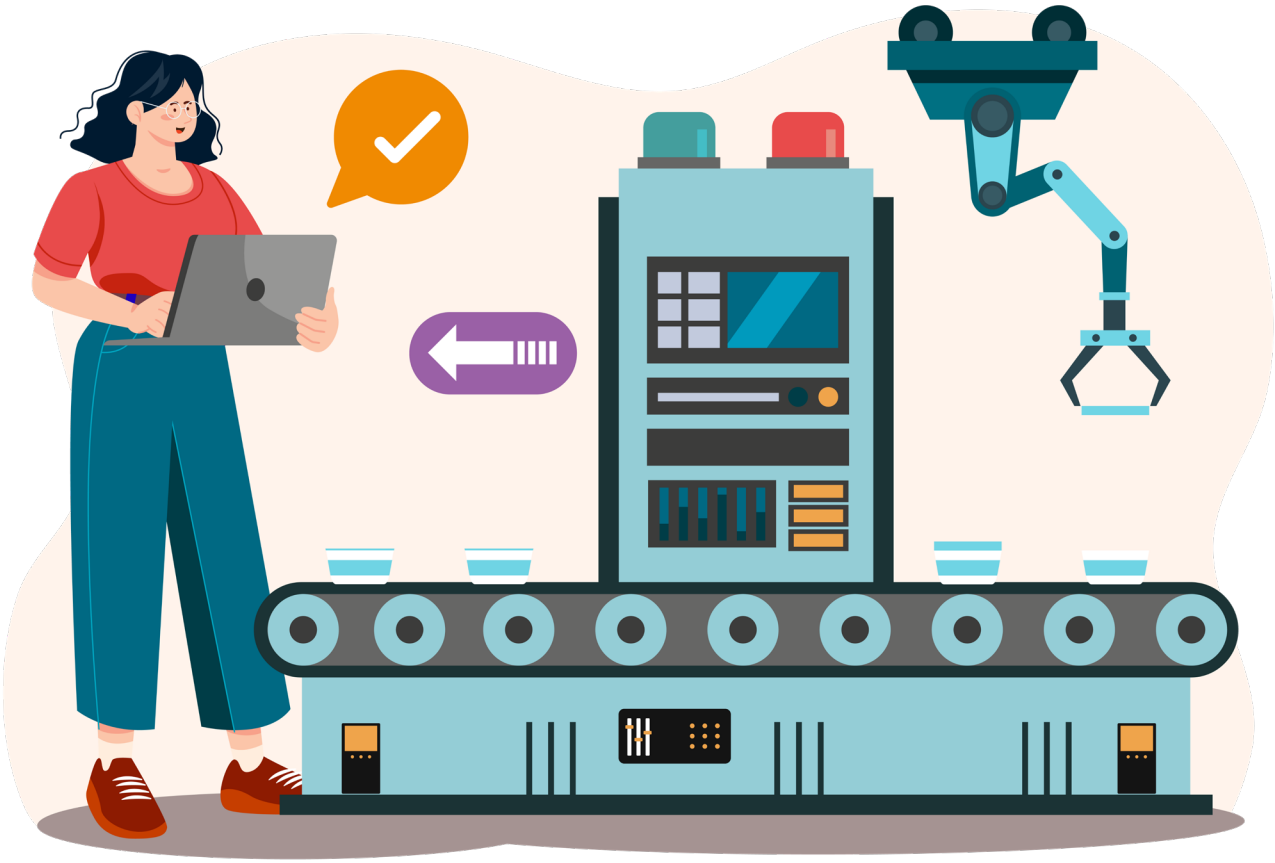
This guide will help you understand **which SPG materials are best suited to your type of machine**—vertical, horizontal, thermoforming, or tray sealing—and to your production process, whether hot or cold filling, pasteurisation, or sterilisation. You will also learn **how to select the most appropriate printing system** based on run length, required quality, and the technology used on your line.

Understanding these differences will allow you to optimise costs and lead times without compromising packaging appearance or safety.

Index

Everything you will find in this guide:

Types of packaging **machines**



Do yo know your machine?

Before considering materials or making decisions about printing systems, it is important to clearly identify the machine used on your packaging line. This may seem obvious, but not all machines operate in the same way. Each has its own characteristics: some handle reels, others pre-made pouches; some seal in cold conditions, others in hot conditions; and some even incorporate integrated thermal treatment systems.

If you are already familiar with these differences, you can move directly to the next section. If not, continue reading to discover the main types of packaging machines and their applications.

Vertical (VFFS – Vertical Form Fill Seal)

Packaging format:

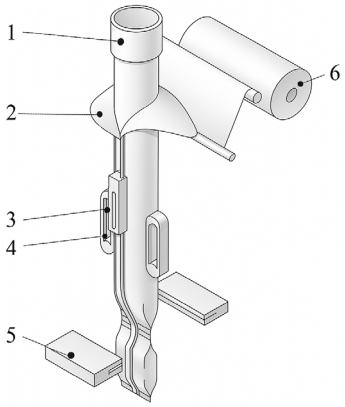
Pillow bags, stand-up pouches, and three-side-seal bags produced from reel on VFFS and/or multi-lane machines.

Recommended material:

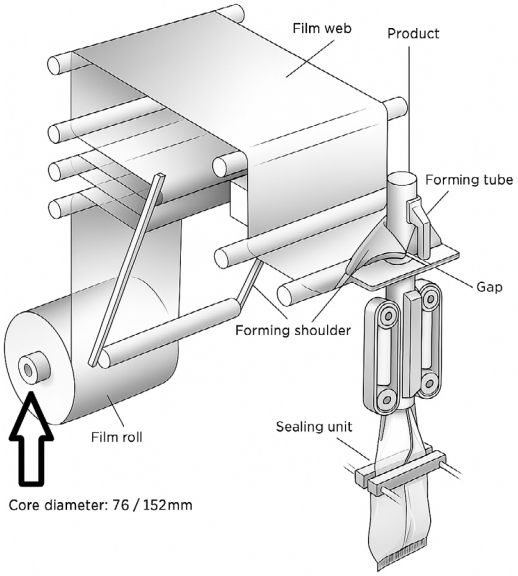
Flexible films such as PE, PET, PP, or multilayer laminates.

Compatible processes:

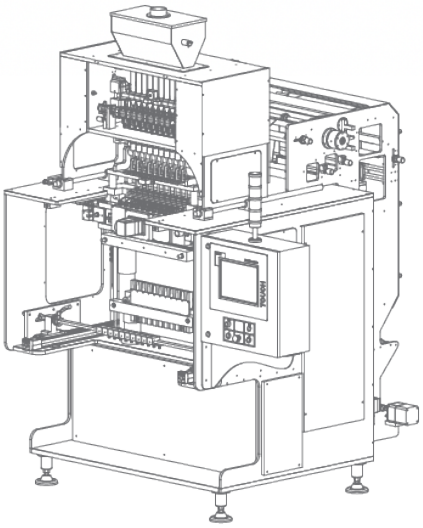
Cold or hot filling; some machines allow pasteurisation.



1 filling tube
2 forming shoulder
3 lengthwise sealing unit
4 traction belt
5 cross sealing jaw
6 plastic film roll



Vertical packaging machine



Multitrack packaging machines for stick pouches

Typical use:

Granulated products, small solids, or viscous liquids.

Key consideration: material compatibility with top and bottom sealing is critical.

Horizontal (HFFS – Horizontal Form Fill Seal)

Packaging format:

Horizontal bags, stand-up pouches (doypacks), flow packs, or sachets.

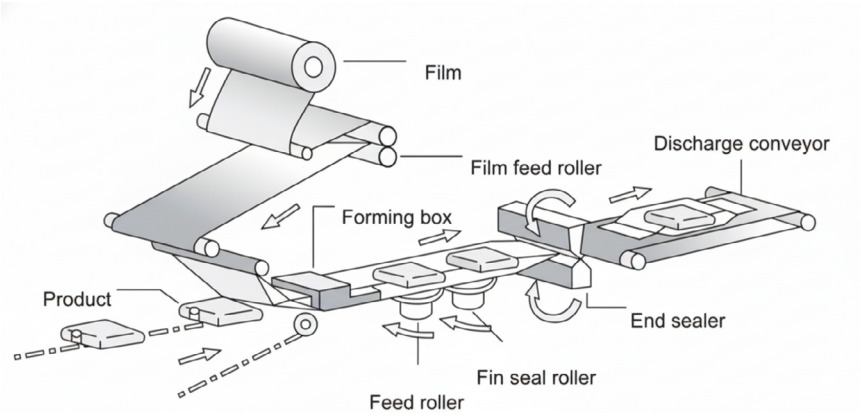
Recommended material:

Flexible and laminated films.

Compatible processes:

Ideal for cold processing; some HFFS lines also support heat.

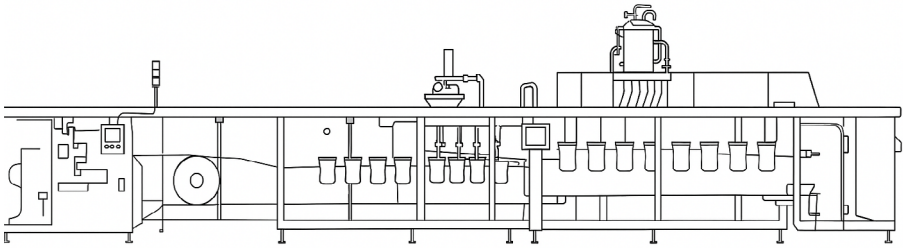
HFFS – Flow-pack from reel.



Typical use:

Flat, delicate, or single-serve products such as cookies, strings of cured meats, snacks, or chocolate bars.

HFFS – Doypack from reel.



Typical use:

Solid, granular, or powdered products such as snacks, coffee, sauces, detergents, fertilizers, packaged chemicals, or technical items.

Thermoforming machine.

Packaging format:

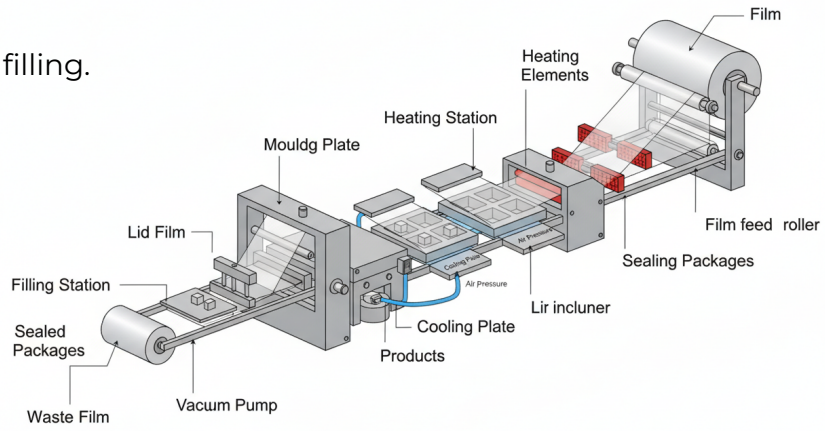
Trays made from thermoformed plastic sheets..

Recommended material:

PET, rigid/flexible laminates, rigid thermoformable and vacuum-formable materials.

Compatible processes:
Pasteurization, sterilization, and hot filling.

Typical use:
Fresh or frozen products, or products containing liquids; packaging that requires a rigid format and extra protection.



Heat sealer.

Packaging format:

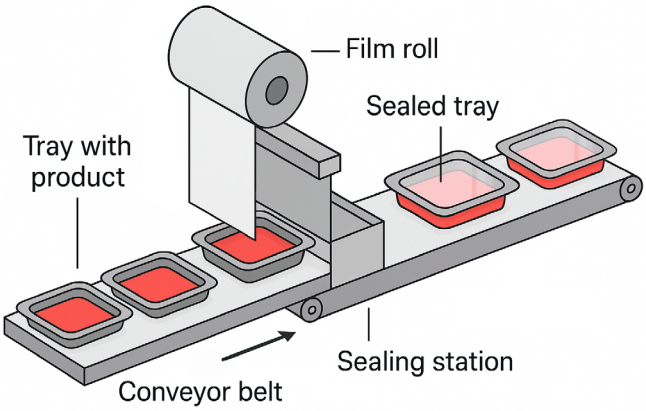
Preformed rigid trays sealed with compatible flexible lidding material.

Recommended material:

PET, PP, and multilayer laminates..

Compatible processes:
Thermal treatments; some lines also allow sterilization.

Typical use:
Products containing sauces or liquids, or those requiring extended shelf life.



Technical requirements for each **machine.**

Knowing the machine type is not enough. Each piece of equipment has technical requirements that directly impact your line's efficiency and product quality. These are the key aspects to consider to get the most out of your investment.

Production speed

Each machine has an optimal speed range. Exceeding it can lead to sealing defects or packaging deformation.

The material and film thickness must be selected based on the machine's actual operating speed to prevent tearing or wrinkling.

Sealing type

- **Heat:** common in flexible bags and thermoformed trays. Requires materials that can withstand the sealing temperature.
- **Coldseal:** the pack is sealed by mechanical pressure (without heat). Ideal for heat-sensitive products..

Material compatibility

Not all materials work on all machines. Some films do not seal properly with heat or cold sealing, while others cannot withstand pasteurization or sterilization processes.

Beyond structure and thickness, consider the required barrier level, flexibility, and mechanical strength based on the packaging format and product.

Resistance to heat, pressure, and special processes.

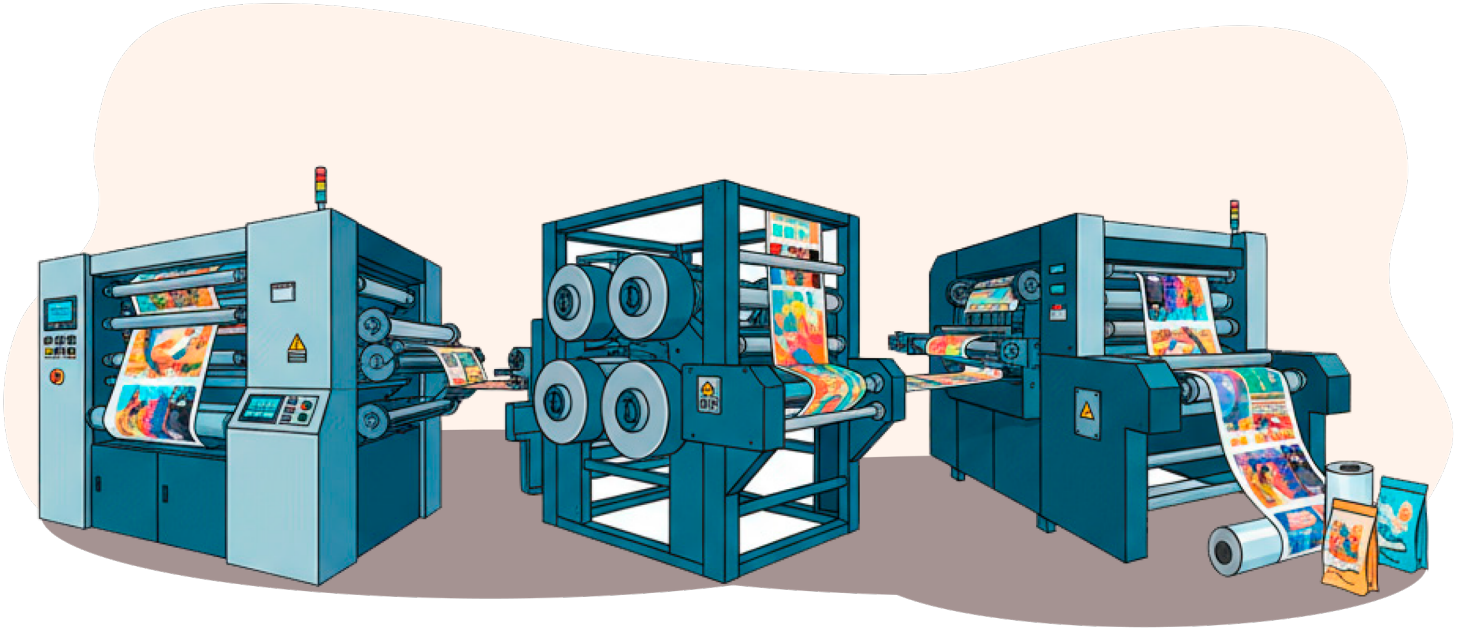
If your line includes pasteurization, sterilization, or hot filling, the material must withstand these conditions without deforming or losing its performance properties.

For cold processes, prioritize materials that maintain integrity and provide a barrier against moisture and external factors.

Useful tip:

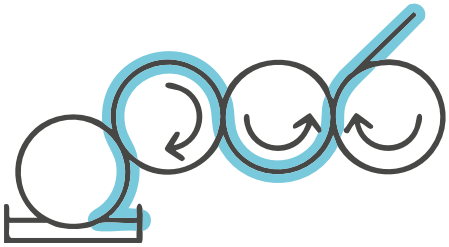
Document your machine settings and parameters to avoid costly mistakes.

Printing **systems.**



When should each technique be used?

Choosing the right system is just as important as selecting the material and packaging format. Printing defines your product's presentation and can directly impact perceived quality, costs, and lead times.



Flexography

A direct rotary printing process. It uses flexible raised plates known as “printing plates” (photopolymer clichés). Ink is transferred from a metering roller (anilox) to the plate, which then prints directly onto the substrate (the plastic film).

Advantages:

- Versatility: prints on almost any flexible substrate (PE, PP, PET, paper, metallized films).
- Lower setup cost: more economical and faster than gravure printing (plates are cheaper than engraved cylinders).
- Quality: modern flexo quality (HD Flexo) is excellent and competes directly with gravure printing.

IDEAL FOR

Small, medium, and high print runs.
It is the dominant process in flexible packaging.

Digital

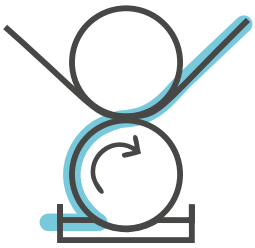
A printing process that does not require plates or cylinders. The image is transferred directly from a digital file to the press (similar to an inkjet or laser printer, but on an industrial scale, using either dry toner or liquid inks).

Advantages:

- Setup cost: zero. No prepress costs (plates/cylinders).
- Changeover speed: instant. You can switch from one design to another immediately.
- Customization: ideal for variable data (codes, different names on each pack).

IDEAL FOR

Small and medium runs, prototypes, new product launches, and promotional or customized packaging.



Gravure printing.

A direct rotary printing process. The image is engraved as recessed cells onto a metal cylinder (typically copper, chrome-plated). The cylinder is immersed in ink, a doctor blade removes the excess, and the ink remaining in the cells is transferred to the substrate under high pressure.

Advantages:

- Exceptional quality: delivers the highest image quality, with outstanding color density, flawless gradients, and unmatched consistency.
- Speed: extremely fast once set up on press.
- Durability: cylinders can last for millions of impressions.

IDEAL FOR Very high-volume runs (millions of meters), such as packaging for snacks, coffee, or labels for global brands where color consistency is critical.

The **perfect** balance

Print run and production volume

Large volumes justify gravure; small runs are best suited for digital.

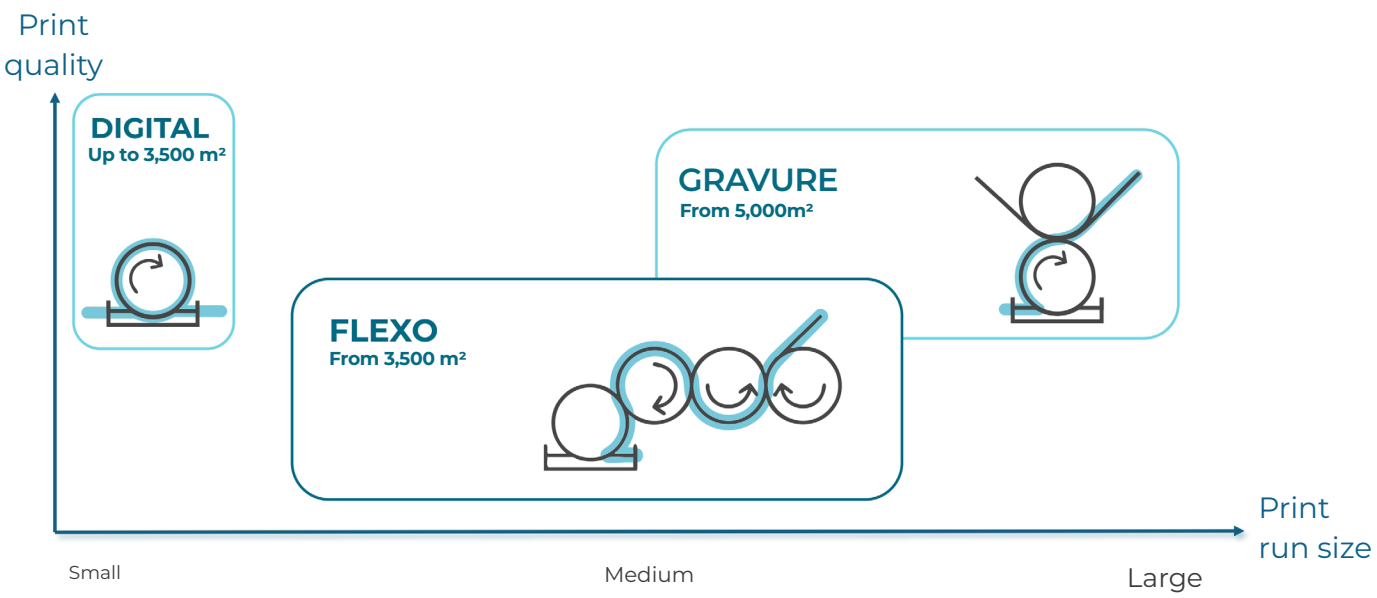
Level of detail and finish

The more demanding the presentation requirements, the more premium the printing process should be.

Compatibility with your production line

Speed, machine type, and material must match the selected printing technology.

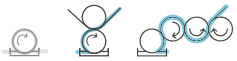
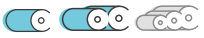
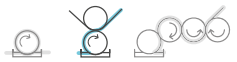
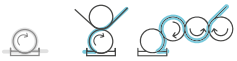
WHEN SHOULD EACH TECHNIQUE BE USED?



Compatibility is **key**

To make things easy, we've brought everything together in a single table: machine types, formats, materials, and the most suitable printing system.

At a glance, you'll see which combinations make sense, and where it may be worth checking your choice with a specialist before moving forward..

Machines	Formats	Materials	Systems	Run size	Processes
Vertical (VFFS)		PE | PET | PP Flexible laminates			Cold Heat Past.
Horizontal (HFFS)		Flexible laminates			Cold Heat *Dep. on line
Thermo		PET Rigid/flexible laminates			Heat Past. Steril.
Tray sealer		PET | PP Multilayer laminates			MAP Past. Steril.

Do you have questions about which material or system is best suited for your machine?

Talk to our experts and get personalized advice to optimize your packaging line

Tips for exceptional **results**

Small adjustments to your machine, material, and production line can save you hours of work, reduce waste, and prevent quality issues.

1 **Match the material to your machine**
Thickness, flexibility, and strength must match your line. Getting this wrong can lead to tearing, wrinkling, or sealing defects.

2 **Optimize your production speed**
Knowing your machine's limits helps you protect quality and avoid wasting material.

3 **Focus on sealing**
Temperature, pressure, and alignment are critical. Detecting issues early helps prevent downtime and delays.

4 **Plan your print runs and printing systems**
Gravure for high volumes, digital for small or customized runs. Keeping color standards and process parameters documented reduces the risk of errors.

5 **Minimize material waste**
Run pilot trials before full production batches. Adjust roll handling, web tension, and alignment to reduce errors

6 **Ongoing line monitoring**
Regular inspections, cleaning, and preventive maintenance help avoid unexpected downtime. Train operators to spot issues before they impact production.

Every production line is **unique**.

Expert guidance can make the difference between saving time and money or facing quality and efficiency issues. Making the right decision from the start is the best way to ensure a smooth, efficient packaging operation.

The confidence of choosing right

Ready to lead the future?

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