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# LAMINATOR FOR THE RETORT PACKAGING

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# LAMINATOR FOR THE RETORT PACKAGING

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- Brief introduction of COMEXI
- Retort packaging: why is it growing so fast?
- Retort packaging structures
- Adhesives & particularities
- Key elements in a laminator to success into the retort packaging



**YOUR PARTNER FOR  
FLEXIBLE PACKAGING  
CONVERTING SOLUTIONS**



CATALONIA - SPAIN



NORTH AMERICA

BRAZIL



ITALY



- Headquarters
- Manufacturing sites
- Spare parts warehouses
- Service sites
- Showrooms
- Sales network



**500**  
Employees

**142**  
Million euros

**2%**  
R+D

**+100**  
Countries

**+2000**  
Customers

**+4500**  
Machinery  
installed



# Retort Pouch

The logo for meetingPACK 2017, featuring a stylized white graphic element followed by the text "meetingPACK 2017" in white, lowercase letters.

3rd  
EDITION



**RETORT POUCH: A flexible package in which prepared food is hermetically sealed for long-term unrefrigerated storage**



The retort pouch was invented by the **United States Army in the 50's**, developed by *Reynolds Metals Company* and *Continental Flexible Packaging*. Both received the Food Technology Industrial Achievement Award for this invention in **1978**.

The **retort pouch** is normally formed by an external PET or Polyamide film for printing which adds stiffness and protection, an intermediate layer of aluminium forming the main barrier against oxygen and water vapour and a film with inert, sealing properties with the packaging content (PP, PE).

**Aaron Brody, Dept of Food Science and Technology, Georgia University.**



# Retort Pouches and Cans

meetingPACK  
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- Better cooking conditions of retort packages (*less overcooking, which leads to an improvement in taste*)
- Reduction in cooking time (30-50% less)
- Packaging is much lighter, less material used
- Storage costs much lower compared to cans (<96%)
- Transport costs much lower (1 truck with printed reels = 25 trucks with cans, or 200.000 cans occupy the same as 2.3 milion retort pouches)
- Permits a higher quality design (different shapes and effects that attract the attention of consumers)
- Possibility of zippers, pour spouts, slider closures, venting valves and easy openings – tear notch-.
- Regular waste disposal
- Improvement in machinery speeds
- Still certain reluctancy to be used by consumers, less evident in young people.





# Retort Pouch

## Region Consumption

**Table 6.6 Chilled ready meals (retort food): consumer flexible packaging consumption by region, 2012–22 ('000 tonnes)**

	2012	2013	2014	2015	2016	2017 (p)	CAGR (%) 2012–17	2022 (f)	CAGR (%) 2017–22
Western Europe	45.7	46.4	47.4	48.0	49.2	50.6	2.1	56.0	2.0
Eastern Europe	10.8	11.4	11.6	12.6	14.0	15.1	6.8	18.9	4.7
North America	94.1	97.1	97.4	99.8	101.6	103.0	1.8	108.8	1.1
South & Central America	13.5	14.2	14.9	14.8	14.8	14.1	0.9	16.8	3.6
Asia-Pacific	124.5	132.1	143.0	153.7	164.0	174.5	7.0	228.7	5.6
Middle East & Africa	23.5	23.5	24.6	25.9	27.4	28.9	4.2	36.6	4.9
<b>Total</b>	<b>312.1</b>	<b>324.7</b>	<b>339.0</b>	<b>354.7</b>	<b>370.9</b>	<b>386.1</b>	<b>4.3</b>	<b>465.8</b>	<b>3.8</b>

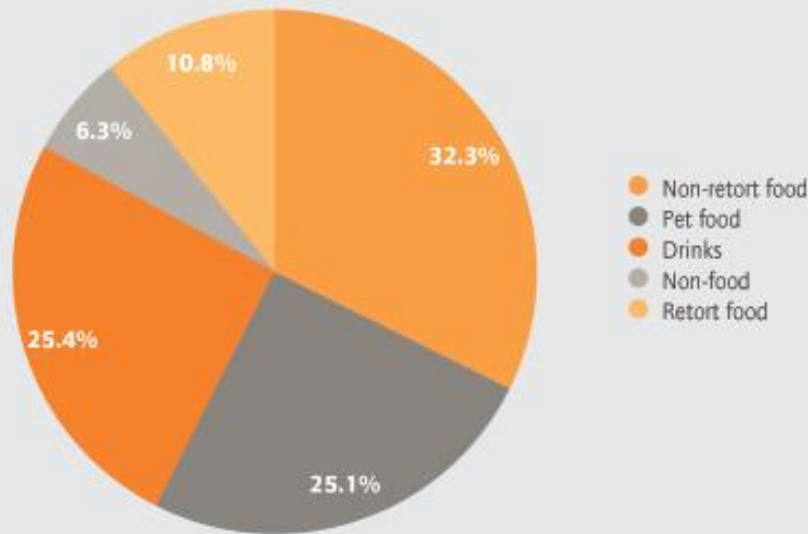
*Note: totals may not add up precisely due to rounding, p=projected, f=forecast*

*Source: Smithers Pira*

- WESTERN EU
- USA
- ASIA-PACIFIC

} Represent 85% of total consumption

Figure 1 Global high-barrier pouch consumption, percentage share by end-use market, 2014 (millions of units)



**165 bilion of units consumed worldwide... what does it really mean?**

- 51 units / capita in US
- 41 units / capita in EU
- 22 units /capita in Latin A.
- 8 units /capita in Africa





# Structure of a Retort Pouch

meetingPACK  
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# Retort Pouch

## HIGH BARRIER ESTRUCTURES



Main objective: this packaging needs to withstand sterilisation process

### Films:

<b>PET 12 <math>\mu</math></b>
<i>Inks (special for retort)</i>
<i>Adhesives (special for retort)</i>
<b>Aluminium 7 <math>\mu</math></b>
<i>Adhesives (special for retort)</i>
<b>CastPP 70 <math>\mu</math></b>

**PET:** Mechanical protection, high gloss and gas barrier properties

**Aluminium:** Light, aroma and gas high barrier properties

•**CPP:** Welding properties, stability in sterilisation processes, protection against aluminium pinholes.

Typical applications comprise pre-cooked rice, soups, sauces, microwaveable retort ready-meals, meat and fish.



# Retort pouch

## Other common structures (4-layers)

PET 12  $\mu$



Adhesives (special for retort)

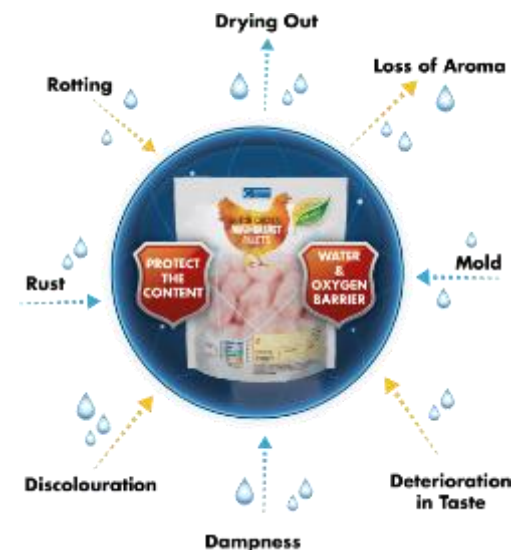
CastPP 70  $\mu$





# What do we need to ensure in the package...

- A very low gas permeability (oxygen)
- A ver low water permeability (moisture)
- Heat sealable
- Withstand sterilization
- High resistance to stretch and puncture
- Non permeability of oils, fats and others
- No solvent retention (ethyl acetate, ethanol, MEK...)
- High bond strength in the complete Package, specially on sealable areas
- Generally, UV light barrier.



# Types of Retort Processes

- Water Spray Retort
- Steam / air retort
- Microwave retort



**Autoclave**

**Temperature range:** 120 – 135 °C  
**Pressure:** 0.18 – 0.50 Mpa  
**Time:** 20 – 90 min

*Burst / tensile tester*





# Adhesives

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# Adhesives

Type of adhesive: aliphatic (no PAA formation)

-PAA- *Primary Aromatic Amines*

Mainly solvent based adhesives  
Solventless adhesives still not highly used

Essential:

- **High coating weight (4.0 to 4.5 gr/sqm)**
- **Wettability on all substrates**
- Curing time (10 - 14 days)
- High room temperature
- Very good bond strength in all kind of materials
- Excellent adhesion on ALU – cPP and ALU-PE
- Excellent adhesion on SiOX and AlOX films

## FEATURES





# Laminator

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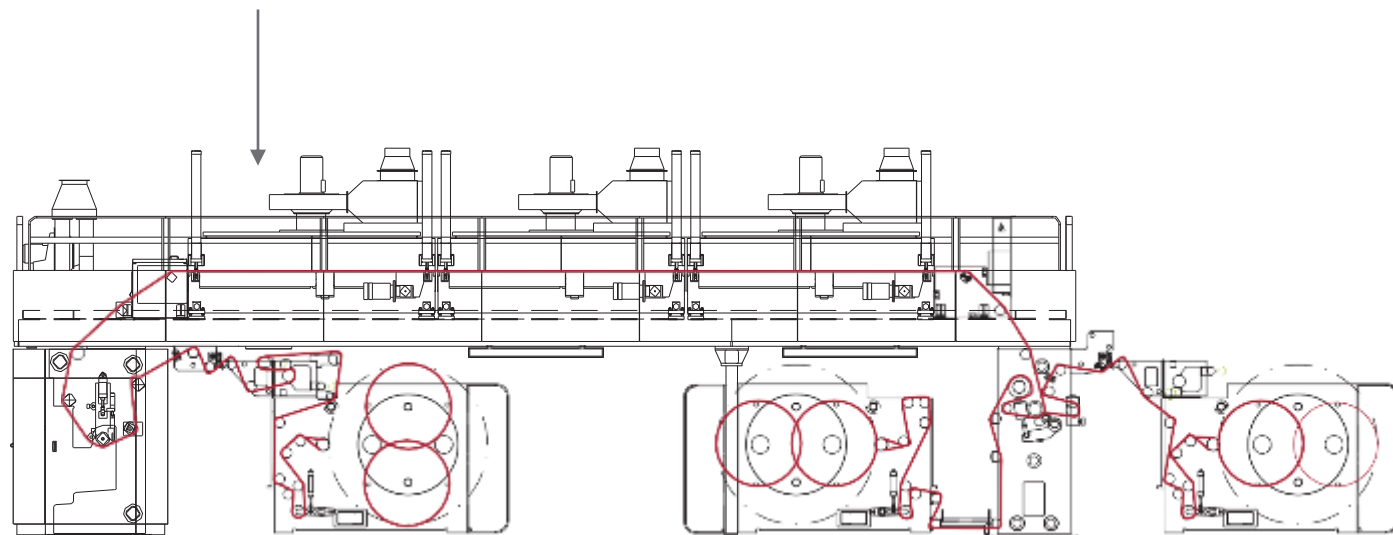


# Key Elements of the Laminator



# Key Elements of the Laminator

DRYING SECTION



COATING

1ST UNWINDER

REWINDER

NIP

2ND UNWINDER



# Coating Station



# Coating Station

## Coating Station

### HIGH CAPACITY EXHAUSTION SYSTEM

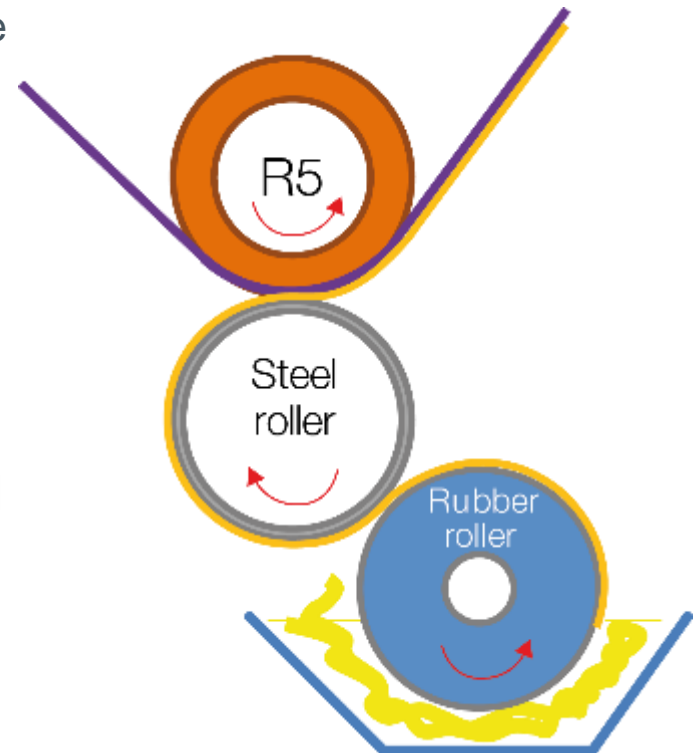
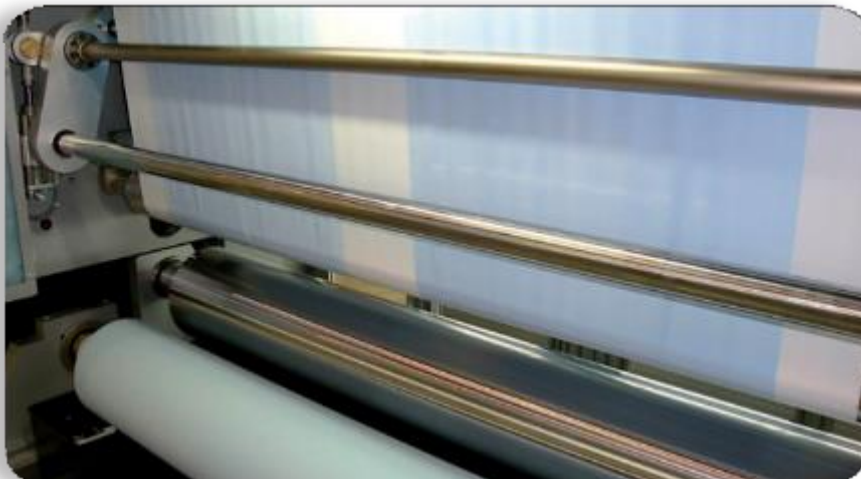
- **Full exhaustion** of solvents from different points (top, bottom and both sides) to ensure a fully solvent clean area (due to the high amount of solvents used).
- **Fast and easy** filter removing.



# Coating Station

## Semiflexo Coating trolley

- **Direct or reverse** coating for achieving a wide range of coating weights.
- **Different relative speed** of rollers and **adjustable gap** in between for adjusting the coating weight.





# Drying Section





# Drying Section

Modular concept of drying units

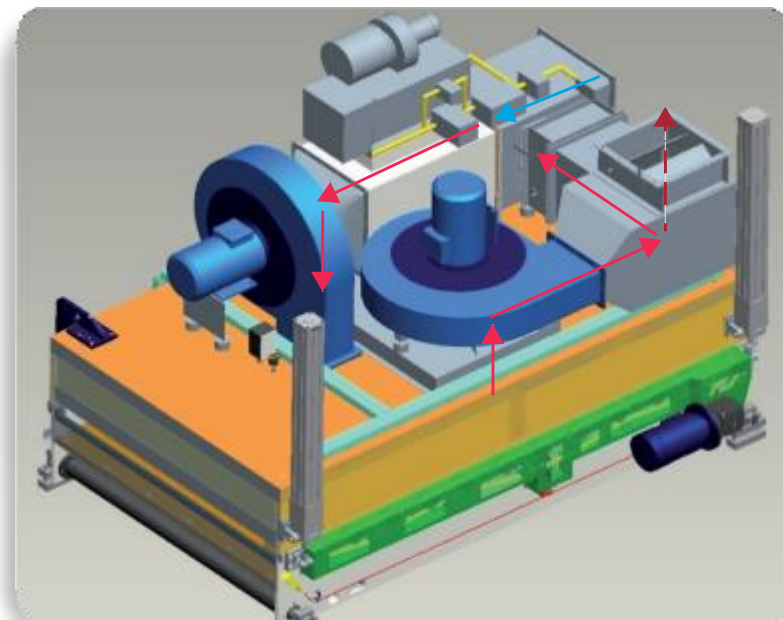


**Tool-less** pull out of each nozzle



**Good accessibility**

**Recirculation controlled**  
by I.R. LEL in every module



## Drying tunnel - **Solvent retention** performance

<b>Machine</b>	3 Drying sections
<b>Unwinder 1 film</b>	PET clear 12 $\mu$
<b>Unwinder 2 film</b>	Alufoil 7 microns
<b>Adhesive</b>	Aliphatic PU adhesive (courtesy Morchem)
<b>Roller</b>	38 lines/cm
<b>Dry Weight</b>	4,7 gr/m <sup>2</sup>
<b>% Solids and viscosity</b>	35% - 17" Cup Ford 4

Speed (m/min)	T (°C) first section	T (°C) second section	T (°C) third section	Solvent retention (mg/m <sup>2</sup> )
150	90	110	100	0,7
250	90	110	100	1,1
350	90	110	100	2,3
450	90	110	100	5,4

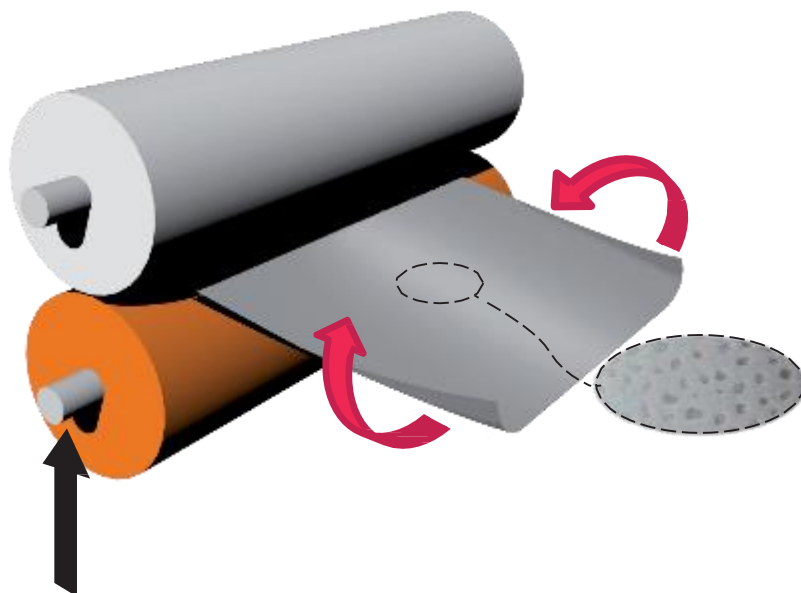
**BELOW  
10 mg/m  
is required**



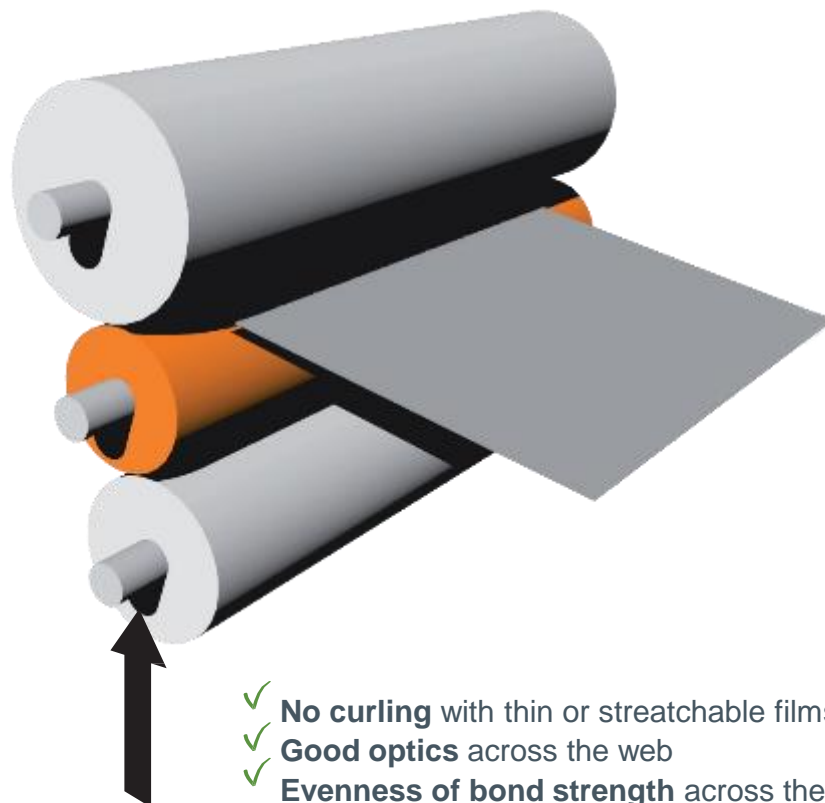
# Nip Point



## 3 rollers lamination NIP



- ✗ Curling with thin and stretchable films
- ✗ Bad optics in the center
- ✗ Irregular bond strength along the web



- ✓ No curling with thin or stretchable films
- ✓ Good optics across the web
- ✓ Evenness of bond strength across the web



# Adapted for Lamination with Alufoil







## Coating evenness control

- Perfect gap control between alufoil and coating roller

## Hard anodized rollers in all the machine

- High scratch and abrasion resistance

## Winders fully adapted for **foil**

- Anodized rollers
- Shifting system
- Horizontal cut

## Preconditioning calender

- Preheats the foil prior entering the NIP to avoid thermal shock



# Full Traceability of Orders

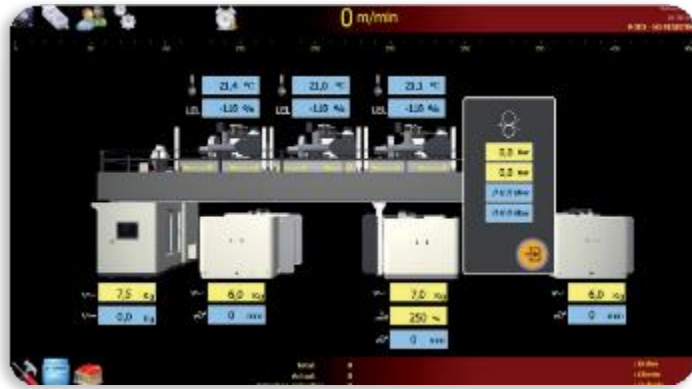




## FULL IN-LINE CONTROL

Measurement in-line of the coating weight on real printed jobs.

## Prodat ■□□ System



### PRODAT CONNECTION

See all data from your computer and get endless types of reports (productivity, waste, working hours,...)

### PRODAT FULL MAINTENANCE

Scheduled warnings appear on the screen when preventive maintenance is required on the machine.

### PRODAT FULL INTEGRATION

All external equipments (Corona Treater, Mixer) are integrated for:

- Saving and uploading all settings, avoiding human errors
- Rulling all equipments from just one screen.

### PRODAT FULL TRACEABILITY

Full control of every single meter produced:

- Print quality reports for your customers
- Take preventive actions before any claim



**THANK YOU VERY MUCH FOR  
YOUR KIND ATTENTION**



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