



## Recycle Ready: *new technical developments to push forward sustainable packaging*

**Kyle Scalise**

**Regional Sales & Account Manager**





## TOPICS

- 1. GENERAL OVERVIEW | 6R STRATEGIES IN SUSTAINABILITY
- 2. TECHNICAL MODIFICATIONS
- 3. INNOVATION CENTRES
- 4. KEY VALUE DRIVERS
- 5. CASE STUDIES
- 6. Q&A



# SUSTAINABLE ENVIRONMENT

**Sustainability**  
matters to  
consumers



The **legislation** is  
evolving, bringing  
new opportunities  
for your brand



**Inflation** is  
taking  
immediate  
importance for  
consumers





## SUSTAINABLE PACKAGING

The European Union is confronted with the following challenges, among others:

- Recycle 65% of packaging by 2025 and 75% of packaging by 2030
- Use 100% reusable or recyclable packaging by 2030





## FOLLOWING THE SUSTAINABLE PATH

### Materials



**Reducing** the usage of packaging materials per packed unit



**Replacing** traditional materials to recyclable, PCR or compostable materials



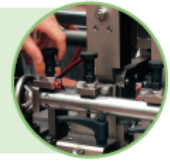
**Removing** the packaging materials associated with the use of the product



### Equipment



**Reengineering** new equipment for new materials and higher OEE



**Retrofitting** install base with technology for new materials and higher OEE



### Packaging



**Reusing** to avoid single-use plastic packaging





## REDUCING USAGE OF RAW MATERIALS

Change from rigid to flexible packaging can save up to 70% plastic.

Not only plastic, but also savings in carbon footprint, storage space and



Optimize the use of raw materials with continuous motion filling technology.

Avoiding the headspace → save up to 15% of film

Use of laser cutting systems → save up to 3% of materials



## REPLACING TO MORE SUSTAINABLE MATERIALS

### CURRENT PACKAGING MATERIALS

- Blend of different types of plastics
- Proven machinability, good behavior
- Solutions for any kind of application
- **Difficult to separate on the recycling process -> Not eco-friendly**



### SUSTAINABLE PACKAGING MATERIALS

- New legislation for 2030 (2025 for Tier-1)
- Difficult machinability, smaller sealing window, stretchiness,...
- Some applications do not have clear solutions yet
- **Recyclable > Eco-friendly**



## REPLACING TO MORE SUSTAINABLE MATERIALS



### RECYCLABLE READY

- Polyolefins
- Mono PE
- Mono PP



### RECYCLED (PCR)

- Contains least 20-30% of recycled materials (polyolefin), others (paper)



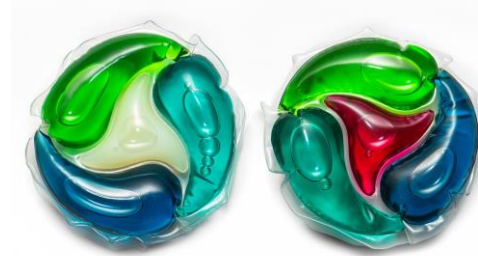
### BIODEGRADABLE OR COMPOSTABLE

- PHA (similar to PE)
- PHB
- PLA
- Paper





## REPLACING TO MORE SUSTAINABLE MATERIALS



### USE OF PAPER

Paper is a recyclable material.

The critical point here is the triple point apex in the gusset: 99% of leakage problem comes from here.

### ADAPTING TECHNOLOGY

Recyclable solutions based on mono polyolephins (PE/PP). Less than 10°C degrees difference between inner and outer layer is a challenge for sealing process.

### BIODEGRADABLE PLASTIC FILM

Convert organic waste into PHB bioplastic. Currently with 1kg of organic waste material we can obtain 500gr of bioplastic.



## REPLACING TO MORE SUSTAINABLE MATERIALS

Converting processes +  
apply Material Science

Material Science +  
supply chain development

1

New Building Blocks

2

Detailed Product Strategy

3

Actual Rigid Packaging  
Solutions and Technologies



HDPE rigid bottles with pump  
weighting over 35g

REDUCE (plastics consumption)  
& use RECYCLABLE (plastics)



Flexible, Recyclable, full PE solution  
reducing plastic weight by over 70%

Use PCR CONTENT



- Up to 90% savings on CO2 impact over rigid
- Up to 90% savings on plastic taxes and EPR fees



## PACKAGING IS REMOVED

SEAWEED FILM



WATER SOLUBLE PODS

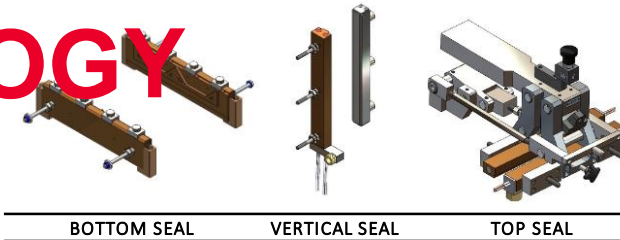




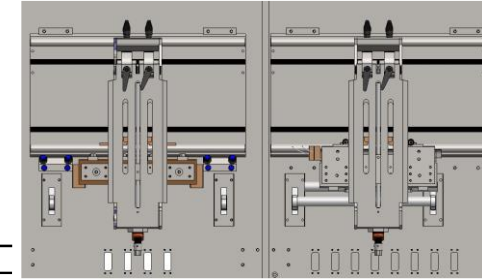
## REENGINERING TECHNOLOGY

We all need to embrace the sustainable challenge as an opportunity to **contribute** to the global **carbon footprint reduction**, while partnering with customers and stakeholders to gain knowledge on these new materials, and how to process them in its equipment.

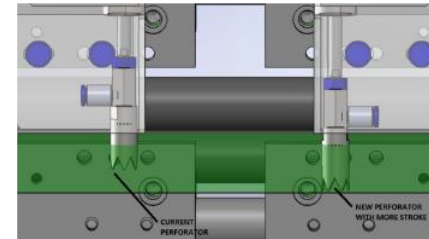
The use of **sustainable materials** is a suitable solution for **optimizing packaging operations** since it provides a mix of brand, financial, and environmental **benefits**.



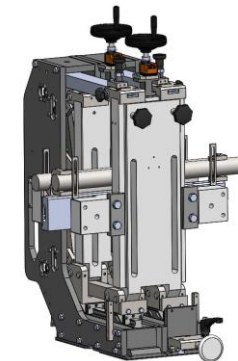
BOTTOM SEAL      VERTICAL SEAL      TOP SEAL



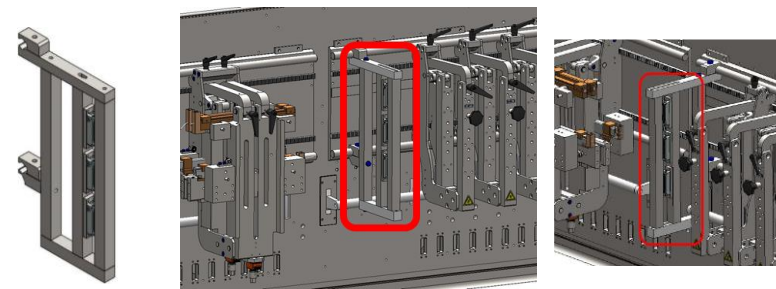
BOTTOM SEALING      ADDITIONAL COOLING STATION & 3 POINT POINTER



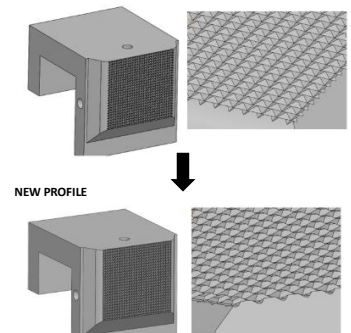
BOTTOM PERFORATORS WITH LARGER STROKE



BOTTOM SEAL COOLING WHEN MACHINE STOPS; AIR BLOWN TOWARDS THE BOTTOM SEAL WHEN MACHINE STOPS  
*Requires software modifications.*



FILM TENSIONING WHEN MACHINE STOPS.  
*Requires software modifications.*





## REENGINERING TECHNOLOGY

For new materials and higher OEE



New and reliable sealing methods are used for sustainable materials



Quick changeovers to reduce material waste when the format is changed



Less energy-consuming when machines are running



## Refilling to Reduce Single Use Packaging

The spout... on a flexible package is of great importance to facilitate ease of transference of liquid products to another container... or even just use as an original package !





## TOPICS

- 1. GENERAL OVERVIEW | 6R STRATEGIES IN SUSTAINABILITY
- 2. TECHNICAL MODIFICATIONS
- 3. INNOVATION CENTRES
- 4. KEY VALUE DRIVERS
- 5. CASE STUDIES
- 6. Q&A



## RETROFITTING: TECHNICAL MODIFICATIONS

### BASIC MACHINE PREPARATION

- Elmedur sealing bars
- Double bottom sealing
- Bottom perforator with larger stroke
- Air cooling on bottom sealing station
- Pneumatic brake (*Film tensioning at machine stop*)
- Film Follower

#### MACHINES WITH SPOUT

- Spout pre-heating
- Servo Driven Spout Applicator
- Corner Spout Double Sealing

#### MACHINES WITH ZIPPER

- Zipper sealing

### ADDITIONAL FEATURES

- Servo driven cutting knives
- Additional pulling station
- Ionizer device
- Suction cups at walking beam
- Detection cameras and Self-Correction

#### PAPER LAMINATE

- Rotating Wheel



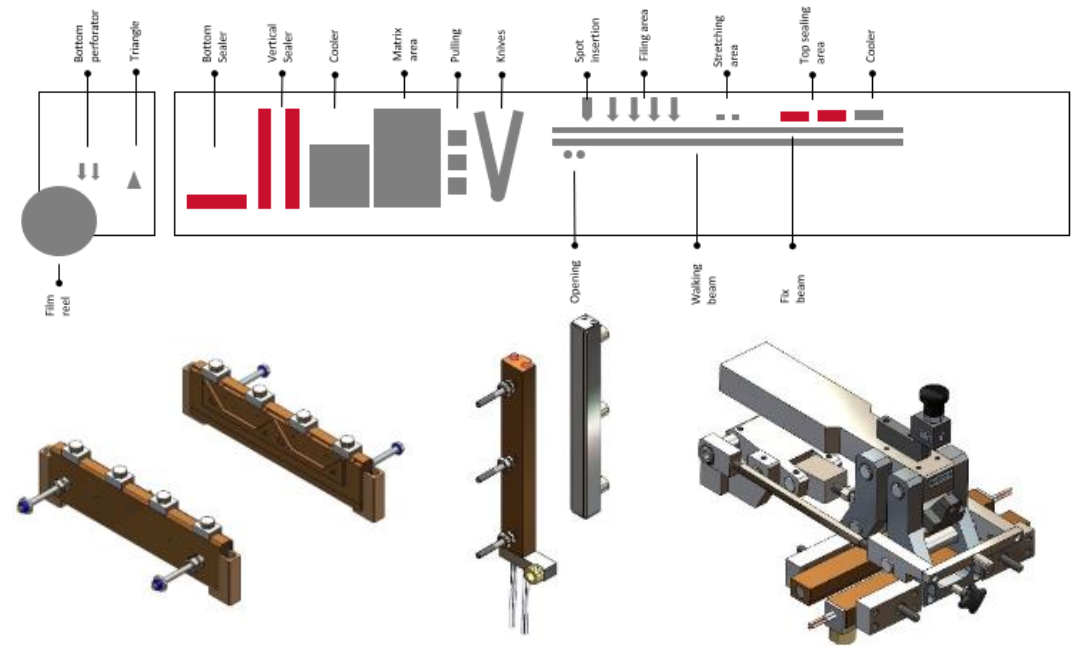




## Elmedur Sealing Bars

- Mono-materials are usually thinner than standard. That effects:
  - Sealing temperature ↓
  - Process window ↓
- **The solution:**
  - ↑ Sealing precision while keeping temperature control.
    - Elmedur material (Copper-Nickel alloy). Controls to  $\pm 3^{\circ}\text{C}$  ( $\pm 5.4^{\circ}\text{F}$ ) variation across sealing bar.

Location of the retrofit:



BOTTOM SEAL

VERTICAL SEAL

TOP SEAL



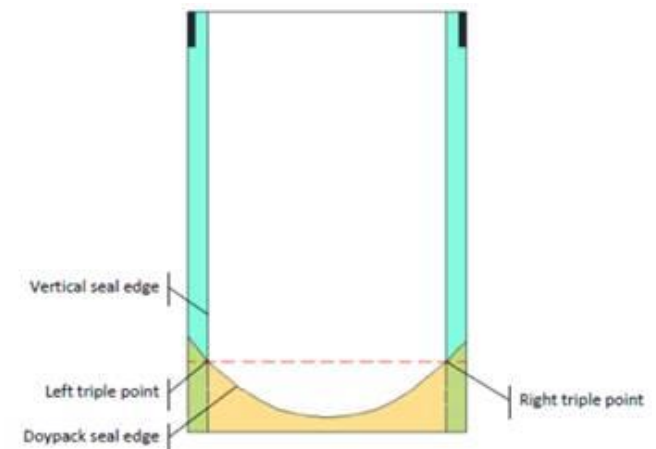
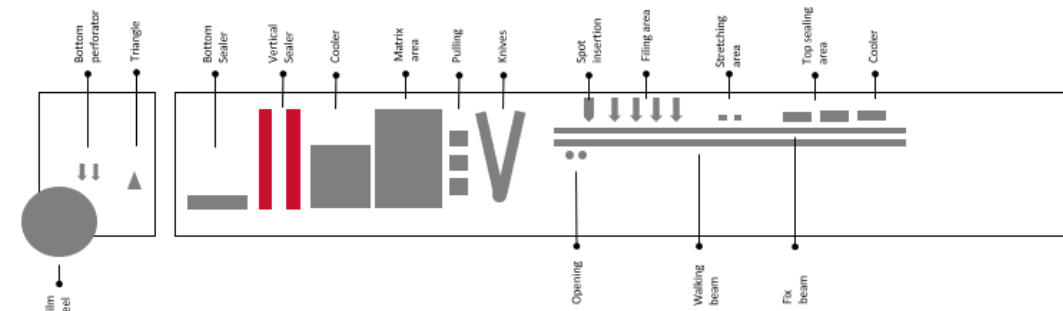
## Double Bottom Sealing Station

- Due to material temperature sensitivity, a cooling station is required after sealing.
  - Vertical & top seals already have it in place by default.
  - Bottom jaw needs modifying to allow installation.

- Due to ↓ sealing temperatures, sealing tightness at triple point is unreliable

- **The solution** is to add double bottom sealing (Elmedur+ silicone / silicone + Elmedur) with 3 different approaches depending on machine configuration:

Location of the retrofit:

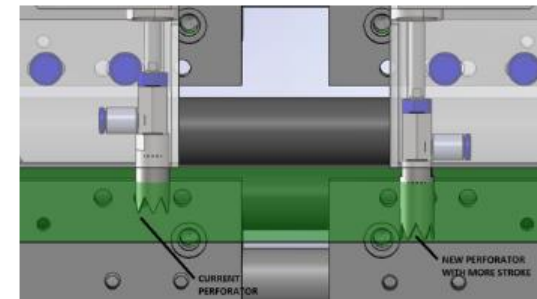
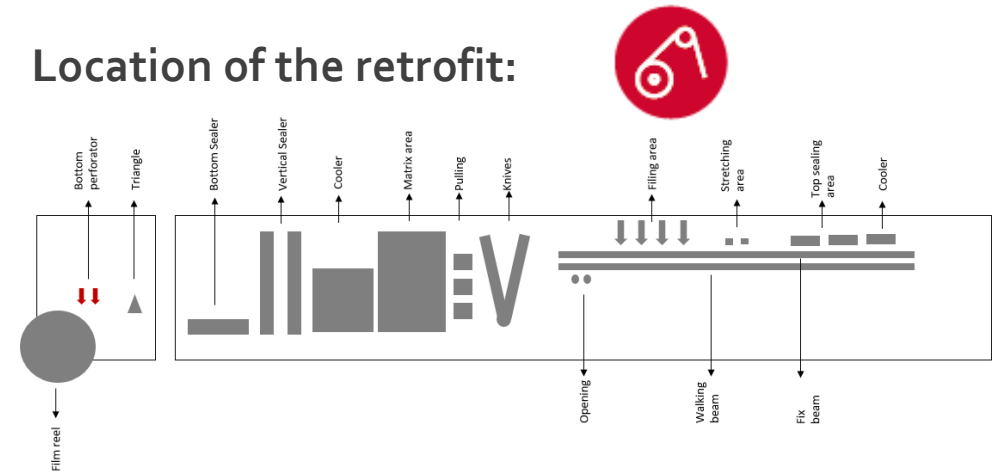




## Bottom Perforator with Larger Stroke

- New materials are less rigid, hence more flexible.
- The **solution** is to add larger stroke bottom perforators to ensure the perforation and scrap removal.

Location of the retrofit:



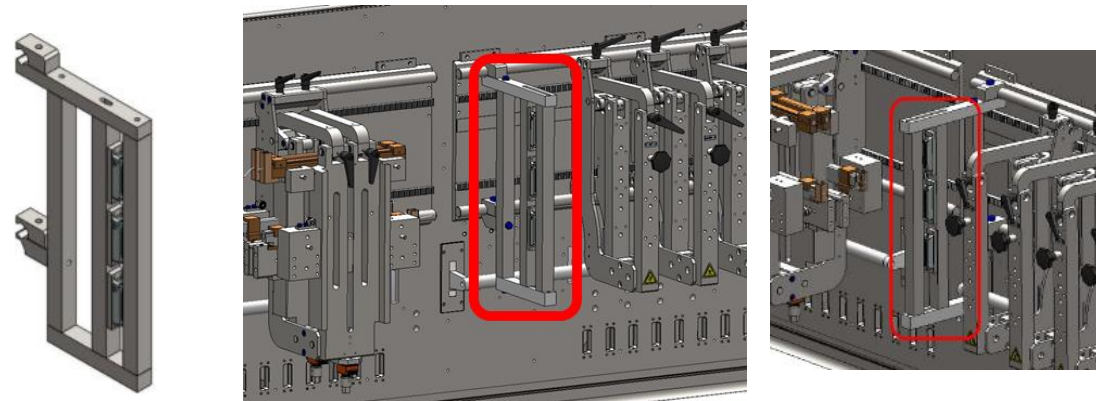
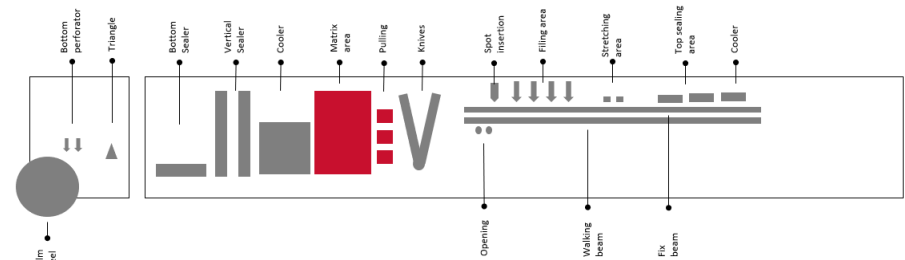
BOTTOM PERFORATORS WITH LARGER STROKE



## Pneumatic Brake (Film tensioning during machine stops)

- Heat accumulation when machine is stopped can provoke laminate deformation, thus losing photocell and eye mark synchronization.
- The **solution** is a combination of pneumatic brakes + additional tensioning via pulling rollers compensates for laminate shrinkage.

Location of the retrofit:



**FILM TENSIONING WHEN MACHINE STOPS.**

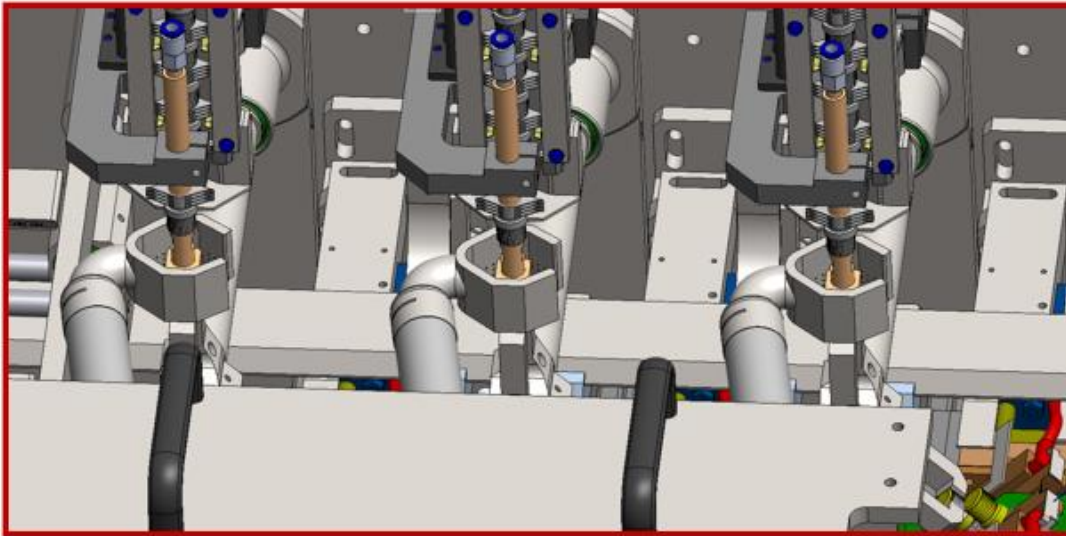
*Requires software modifications.*



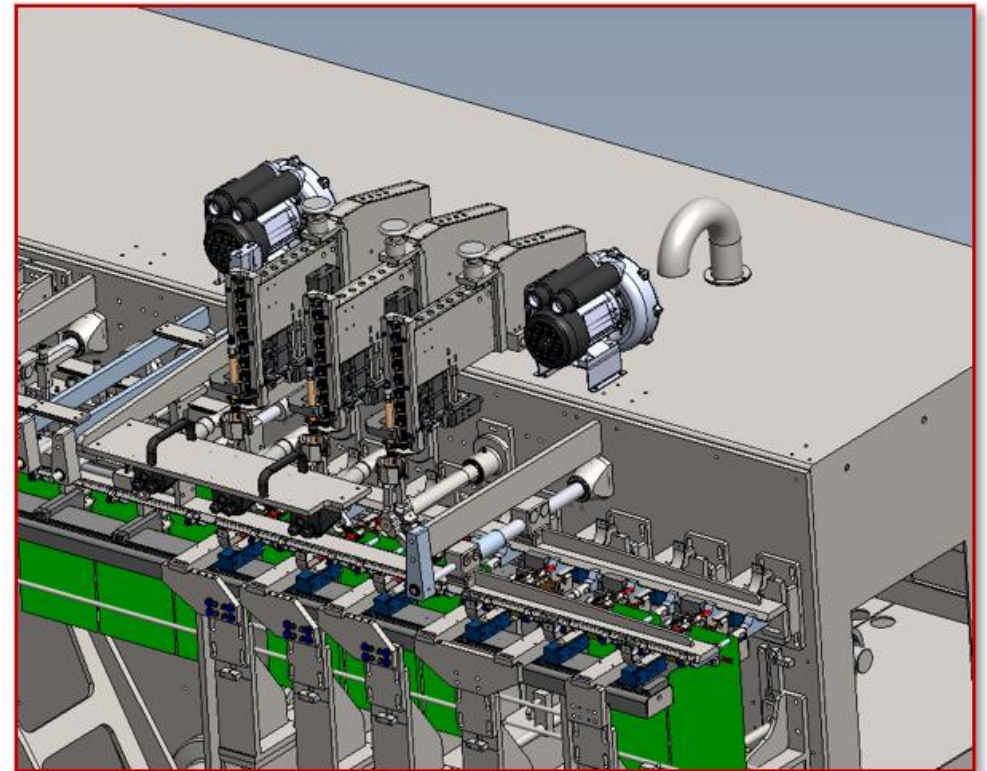
## Pre-heating technology for spout

Enhance heat transfer and control

New surround nozzle



New solution



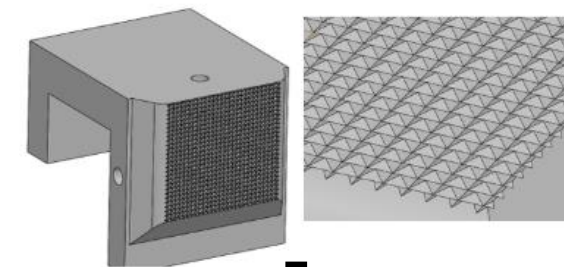
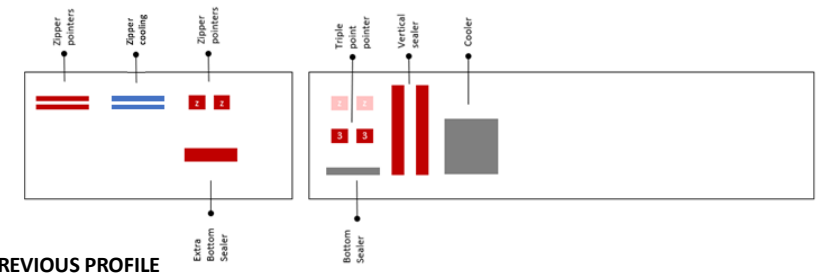


## Zipper Sealing

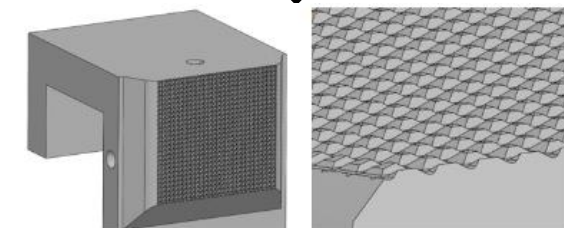
- Zipper sealing process is also affected, due to the lower sealing temperatures, in comparison to standard laminates.
- The **solution** is replacing Zipper sealers also, by using new Elmedur sealers and pointers, in order to ensure a temperature variation of no more than  $\pm 3$  degree Celsius ( $\pm 5.4$  °F) across the sealing jaw.

In order to avoid puncturing the laminate, the new pointers will also have a redesigned profile with a lower ridge shape.

Location of the retrofit:



NEW PROFILE





## TOPICS

- 1. GENERAL OVERVIEW | 6R STRATEGIES IN SUSTAINABILITY
- 2. TECHNICAL MODIFICATIONS
- 3. INNOVATION CENTRES
- 4. KEY VALUE DRIVERS
- 5. CASE STUDIES
- 6. Q&A



## TESTING CAPABILITIES



Lab testing machines exclusively dedicated to develop new technologies for sustainability.

2 different locations for film testing: Mespac HQ (Barcelona), DOW Pack Studios (Freeport, TX)





## INNOVATION CENTRE IN BARCELONA (HQT)

### Model: H-260 FERR

2024 Latest Technology machine ready for handling sustainable materials

- Full servo machine
- Zipper, corner spout and top spout applicators
- Liquids and powder fillers
- 'Athena' software connected to the cloud
- AI capabilities
- Mespakometer





## DOW PACK STUDIOS (FREEPORT, TX)



### Model: H-180 FE

This model is fitted with top spout. This machine is designed to test new material developments & machine technologies for sustainable packaging. This machine is also capable of installing zippers.

It does the same tests as her sister line in the Barcelona location, (previous slide).



## STEPS TO ACHIEVE A FLEXIBLE SUSTAINABLE PACKAGING

Step 1

Work with **PARTNERS** and **CUSTOMERS** to understand their current packaging's **carbon footprint impact**



Step 2

Move to **recycle-ready** flexible packaging



Step 3

Proposal of machine according to **materials agreed**



Step 4

Optimize the solution by **reducing the use of material (laser, headspace, others)**



Step 5

Ready to deliver **recyclable-ready Flexible Packaging**



## Lab Testing ADVANTAGES

- Testing in a controlled environment with expert technicians
- Reliable and accurate results
- Collect know-how to be applied in future designs
- Easily known the needed improvements in the technology to work with the required material
- Avoiding production downtime
- The testing cost is much lower than the production downtime
- ~~Cost:~~ Getting a Rich database of the tests and testing procedure
- Find the best set of parameters for the tested materials
- Creation of the final test report



**Facilitate Future Business using Sustainable Material**



## PARTNERS

MATERIAL:



FILMS:



CAPS, VALVES, OR  
CLOSURES:



COMPONENTS:



AUXILIARY EQUIPMENT FamarTec



## TOPICS

- 1. GENERAL OVERVIEW | 6R STRATEGIES IN SUSTAINABILITY
- 2. TECHNICAL MODIFICATIONS
- 3. INNOVATION CENTRES
- 4. KEY VALUE DRIVERS
- 5. CASE STUDIES
- 6. Q&A



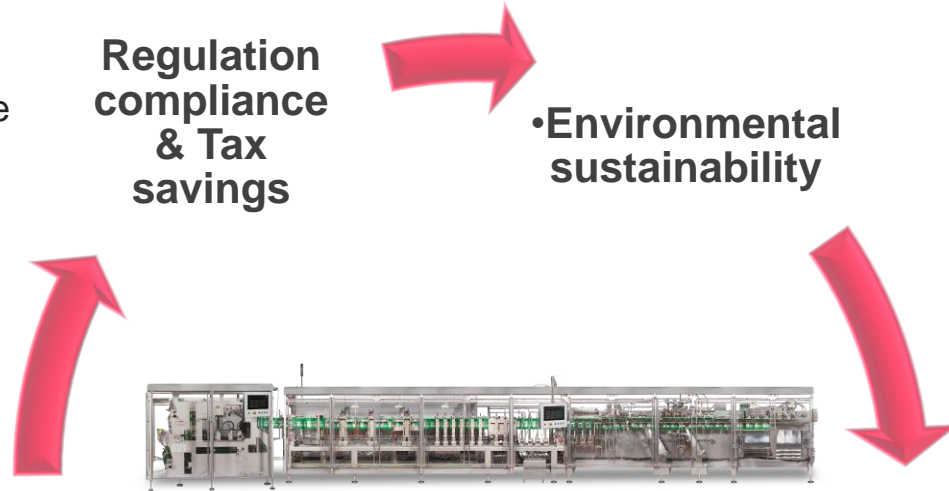
## KEY VALUE DRIVERS

The client may guarantee compliance and prevent any penalties by utilizing recyclable and sustainable plastic film, as well as avoiding the payment of plastic taxes.

**Regulation compliance & Tax savings**

**•Environmental sustainability**

Less carbon footprint to create a more sustainable future by using recyclable or sustainable plastic film. (CSR)



Using sustainable film might provide the client a competitive edge in the market given the rising consumer demand for environmentally friendly products.

**Market demand**

**Brand reputation & product value**

By using eco-friendly packaging materials.

**Cost savings**

The use of recyclable- ready film has fewer production costs. Save up to 70% of plastic and less footprint requirement from rigid to flexible



## TOPICS

- 1. GENERAL OVERVIEW | 6R STRATEGIES IN SUSTAINABILITY
- 2. TECHNICAL MODIFICATIONS
- 3. INNOVATION CENTRES
- 4. KEY VALUE DRIVERS
- **5. CASE STUDIES**
- 6. Q&A





## Case Studies with positive results



Customer “U” global team booked for 3 months the Barcelona test line in order to test 35 different films.

» Data for use related to possible retrofits of existing lines.



Customer “U” Thailand facility machine optimal parameters obtained in MIC installation prior to FAT.

» Real machine, during FAT, could take advantage of these parameters.



Major “spout supplier” is currently developing his future designs in the Barcelona test line machine.

» Leading technology to support machine builders regarding a new spout type.



Peak tension test, developed in MIC installation.

» Allows generation of real data in order to quantify the need of continuous motion pulling rollers.



Validation test with Customer “A-B” before to acquire new machines

» Ensure film performance



## Case Study – R.F.

### CHALLENGE

- Retrofit 2 machines to produce monomaterial spouted pouches, filling liquid products, and meeting the production needs All this, considering that the machines had many electronic components obsolete.

### SOLUTION

- Engineering study to identify the required retrofit kits.
- Onsite visit to audit machine status and ensure all the technical study matches with the reality.
- Plan the intervention to carry out retrofit works, adapting the number of resources to the available amount of time.
- Training of all operators to the requirements of the new laminate

### RESULTS

- In time execution of the works.
- Launching monomaterial pouches in the planned timeline



## CASE STUDY – ETS.F.

### CHALLENGE

- Retrofit 2 machines to produce monomaterial pouches for pouches with zipper, filling cereal products, and producing several pouch sizes.

### SOLUTION

- Engineering study to identify the required retrofit kits.
- Plan the intervention to carry out retrofit works, adapting the number of resources to the available amount of time.
- Testing all pouch sizes to ensure smooth transition.

### RESULTS

- All pouch sizes successfully
- Launching monomaterial pouches in the planned timeline.



Video courtesy of: ***AMCOR – MENSHEN – MESPAC***



*Video courtesy of: **MONDI – COMEXI -- MESPAC***



## TOPICS

- 1. GENERAL OVERVIEW | 6R STRATEGIES IN SUSTAINABILITY
- 2. TECHNICAL MODIFICATIONS
- 3. INNOVATION CENTRES
- 4. KEY VALUE DRIVERS
- 5. CASE STUDIES
- 6. Q&A



# Thank You !

# Any Questions ?

