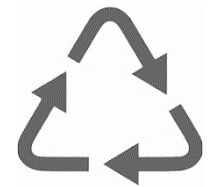
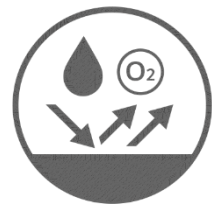


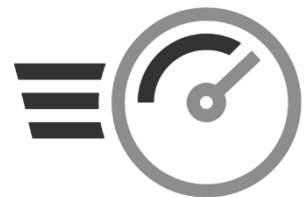
Flexible Packaging Towards Circular Economy



RECYCLABLE



HIGH-BARRIER



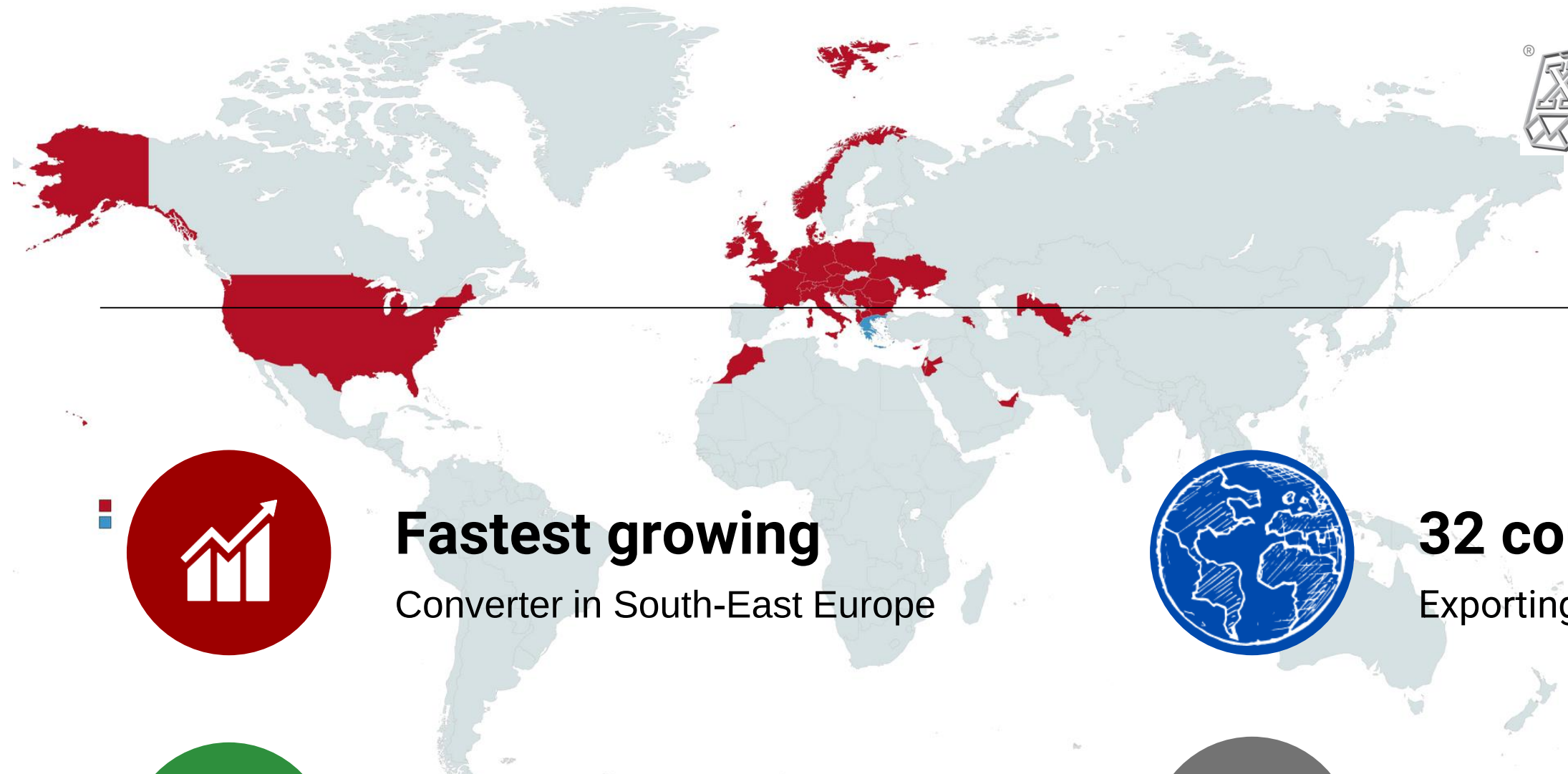
HIGH-PERFORMANCE




Contents



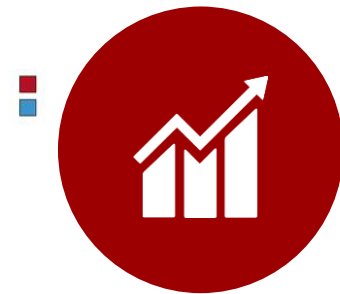
01	About Hatzopoulos
02	Packaging Sustainability
03	Design for Recycling X-CYCLE
04	X-CYCLE Case studies
05	Network & Contact information



>> Turnover 2021
96 million €



+10%
Annual Exports Growth
2017-2021 average



Fastest growing
Converter in South-East Europe



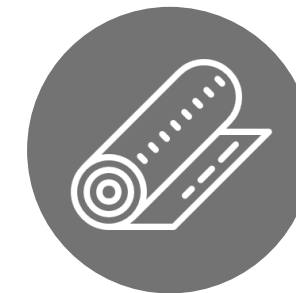
3rd generation
Family-owned



90 years
Packaging experience



32 countries
Exporting activities



4 product categories
Food | Coffee | Non-food | Labels



430 employees
Packaging passionates

Technology



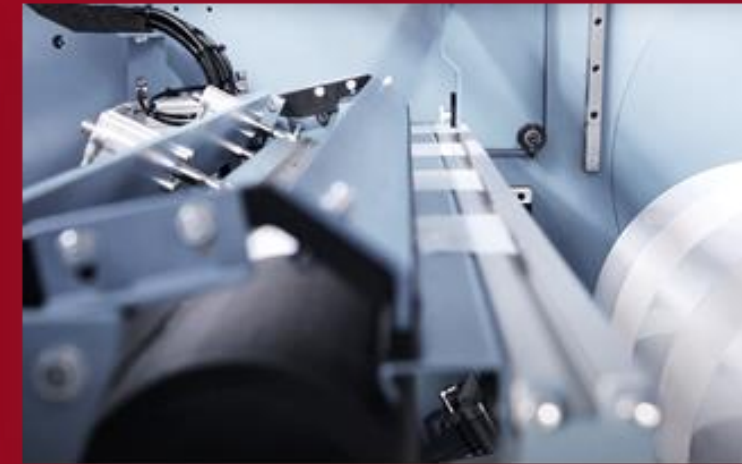
PRINTING

- Pre-Press in-house
- Full-HD Flexo-plates production
- Gravure Cylinders engraving
- Rotogravure printing – 10 colors
- Full-HD Flexo printing – 10 colors
- Both-sided printing
- Promotional serial-codes printing



LAMINATION

- Solvent-based
- Solvent-free
- Triplex-in-line
- Quadriplex



SLITTING

- High precision
- Up to 1.200mm OD



ADD-ON TECHNOLOGIES

- Lacquering – Haptic effects
- Laser-scoring – Any form
- Cold-seal application



Sustainability

We are committed to help our customers achieve their sustainability goals. With the vision for a better future planet, we offer eco-friendly packaging solutions and the next generation of flexible packaging designed for recycling: X-CYCLE.



- X-CYCLE | Recyclable films
- Bio-based films
- PCR-content materials
- Sustainable converting

X-CYCLE films



>>> Redesign your packaging for Recycling

X-CYCLE PP | X-CYCLE PE | X-CYCLE POLY

- Design according to CEFLEX and OPRL directives
- Recycle-ready solutions for all recycling streams
- Mono-material, all-PE and all-PP solutions
- Optional Recyclability Certification (Cyclos, Interseroh, Recyclclass)



X-CYCLE films



>>> Redesign your packaging for Recycling

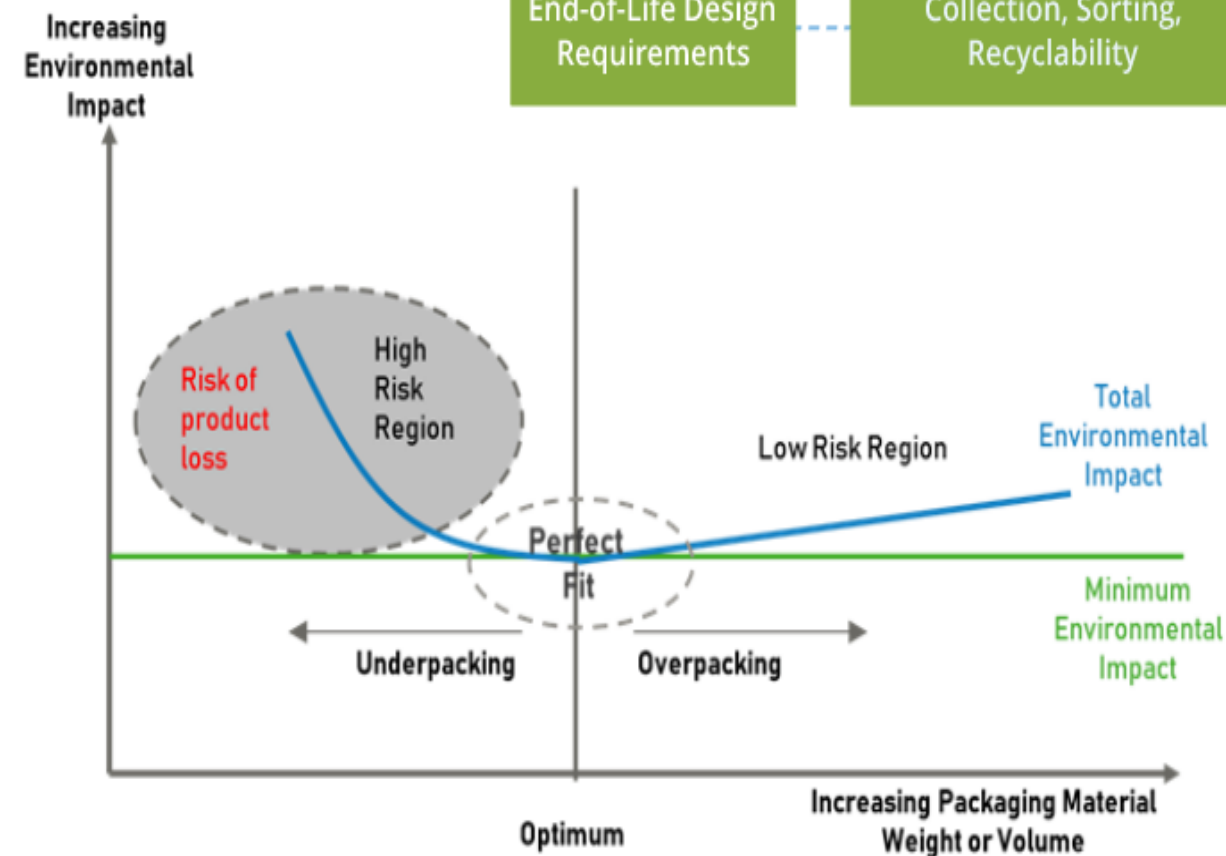
X-CYCLE PP | X-CYCLE PE | X-CYCLE POLY

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Design for Recycling

Based on the CEFLEX guidelines & OPRL and the packs' end-of-life design requirements



>>> End-of-life design requirements

- Collection
- Sorting
- Recyclability

Design for Recycling

	FULL COMPATIBILITY	LIMITED COMPATIBILITY	NOT COMPATIBLE
Materials	>90% mono PE or PP >90% mix PO	80-90% mono PE or PP 80-90% mix PO	PVC films Alu/Plastic laminates PET-/PA-based laminates
Barriers & Coatings	AlOx, SiOx, EVOH, PVOH, Acrylic coatings & metallised layers; each <5% of total film weight	>5% of total film weight each barrier layer / coating	PVDC
Inks & Lacquers	Clear, natural, paler colors Lacquers & inks up to 5% of total packaging film weight	Lacquers & inks >5% of total packaging film weight	Carbon black containing masterbatch >60%
Adhesives & Cold Seal	Polyurethane, acrylic or natural rubber latex adhesives, as well as non-PE or non-PP based tie-layers, are permitted to a maximum of 5% by weight of the total packaging structure	>5% of total packaging film weight	To be determined
Size, Shape & Add-on features	< 1 g/cm3 Above 20mm x 20mm Same material type as the main pack material	< 1 g/cm3 Above 20mm x 20mm If the pack contains different materials, then these parts should be easy to separate.	> 1 g/cm3 Below 20mm x 20mm

>>> CEFLEX GUIDELINES for full compatibility



- Density → <1g/cm³
- Monomaterial preferred → facilitates recycling, improved recycle quality
- Inks: carbon black-free, light colors preferred → up to 5% of total weight
- Barriers (AlOx, SiOx, EVOH, metallization) → up to 5% of total weight
- Adhesives → up to 5% of total weight
- Add-on pack components allowed → same material as main body

>>> Request the free Handbook online to get the complete guidelines



Design for Recycling



>>> OPRL labeling rules

- Only monomaterial accepted → all-PE or all-PP films (since January 2022)
- All-PE packaging → max. 5% of PP
- All-PP packaging → max. 5% of PE
- Barriers (AlOx, SiOx, EVOH, PVOH, metallisation) → up to 5% of weight
- Adhesives → up to 5% of total weight
- No paper labels
- Add-on flexible and rigid pack components → same material as main body OK for recycling





X-CYCLE Achievements



GAEA – CERTIFIED RECYCLABLE PACKAGING

World Packaging Organization – WPO | WORLDSTAR WINNER 2022



LINCOLN & YORK'S RECYCLABLE PACKAGING FOR COFFEE

WORLDSTAR 2021
PRESIDENT'S AWARD WINNER



HEMA - RECYCLE READY PACKAGING FOR COFFEE

PACKAGING AWARDS | SILVER 2020

Successful examples



MONO - PP
LAMINATES



MONO - PE
LAMINATES



MIXED - PO
LAMINATES



Case 1: 1kg Coffee Bag

Switch to an **all-PP, high-barrier** laminate



Packaging Film Weight	
Weight	89 g/m ²
Barrier properties	
OTR (23°C / 0%rh)	<1,5 cm ³ /m ² /day
WVTR (38°C / 90%rh)	<0,5 g/m ² /day

Packaging Film Weight	
Weight	89 g/m ²
Barrier properties	
OTR (23°C / 0%rh)	<0,45 cm ³ /m ² /day
WVTR (38°C / 90%rh)	<0,65 g/m ² /day



Monomaterial
All-PP, OPRL-compliant packaging solution



High Barrier
Against oxygen, water vapor and aroma



Full Performance
Output rate: 70 side-gusseted bags with button valve / min.

Case 2: Coffee 1kg bag

Switch to a **lighter, all-PE, high-barrier** laminate



Packaging Film Weight	
Weight	130 g/m ²
Barrier properties	
OTR (23°C / 0%rh)	<0,5 cm ³ /m ² /day
WVTR (38°C / 90%rh)	<0,25 g/m ² /day

Packaging Film Weight	
Weight	118 g/m ²
Barrier properties	
OTR (23°C / 0%rh)	<1,2 cm ³ /m ² /day
WVTR (38°C / 90%rh)	<5 g/m ² /day



Monomaterial
All-PE, OPRL-compliant packaging solution



High Barrier
High barrier properties against oxygen & aroma

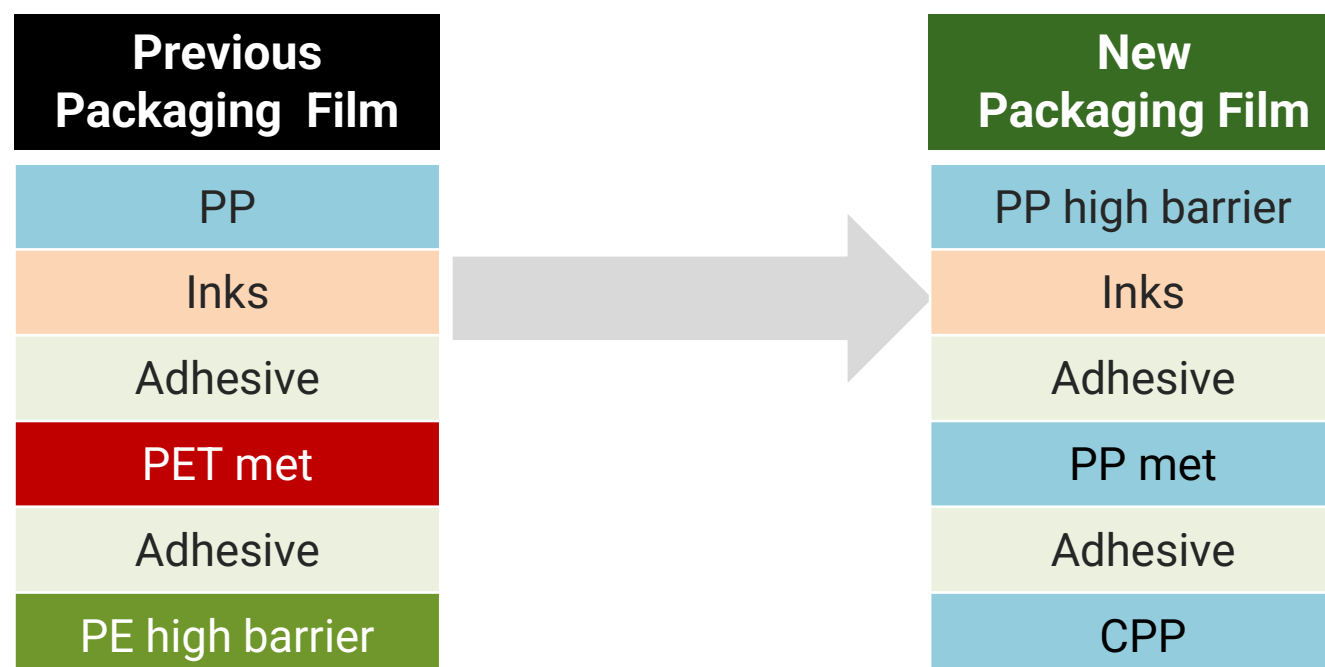


Lightweight
less plastic packaging weight

Case 3: Snacks SUP

Switch to a mono-PP, certified as recyclable laminate

Certified recyclability



Packaging Film Weight	
Weight	120 g/m ²
Barrier properties	
OTR (23°C / 0%rh)	<0,6 cm ³ /m ² /day
WVTR (38°C / 90%rh)	<0,5 g/m ² /day

Packaging Film Weight	
Weight	97 g/m ²
Barrier properties	
OTR (23°C / 0%rh)	<0,45 cm ³ /m ² /day
WVTR (38°C / 90%rh)	<0,6 g/m ² /day



Lightweight
-19% less plastic packaging weight



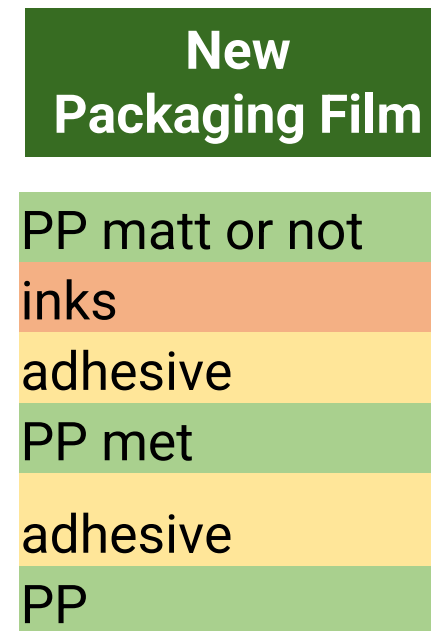
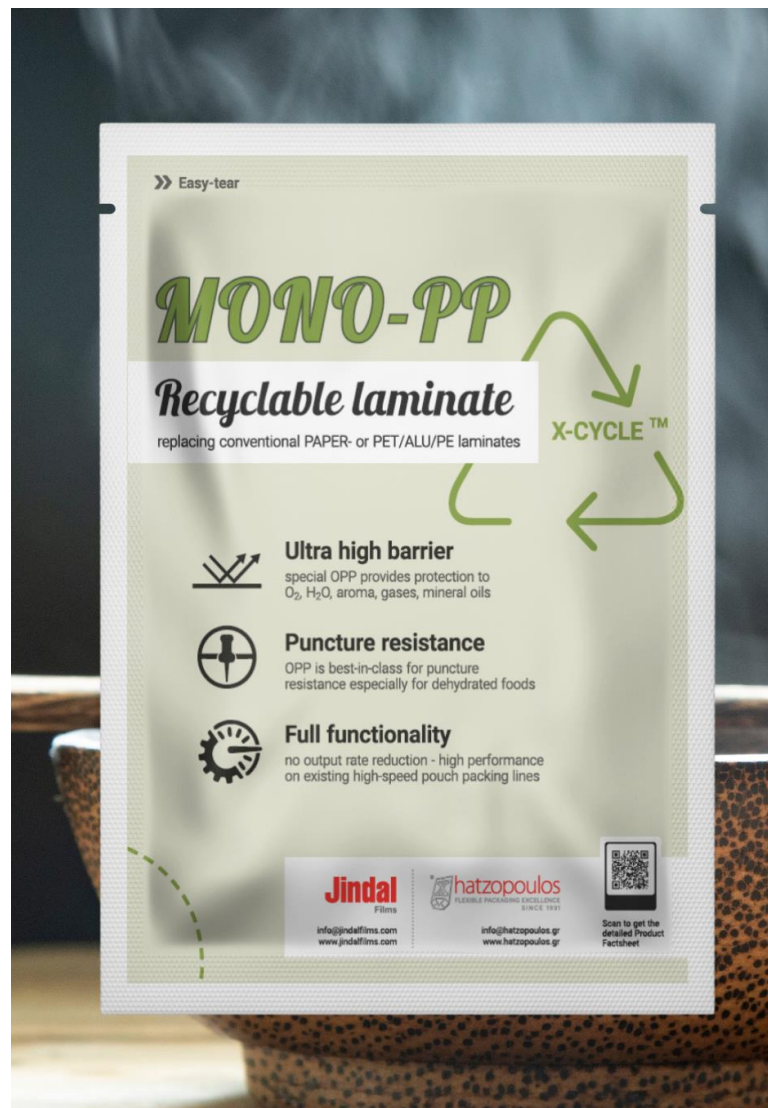
High Barrier
Better barrier properties against oxygen and water vapor



Certified Recyclability
MADE FOR RECYCLING certified by Interseroh

Case 4: Dried foods pack

Switch to a **lighter, all-PP, high-barrier** laminate



Monomaterial
All-PP packaging solution



High Barrier
High barrier properties against oxygen & aroma



Puncture resistance
Full functionality

Ex.9: Cereal bar pack

Switch to **all-PE, high-barrier** laminate



Previous Packaging Film
varnish
PP coex
Inks
Adhesive
PP met
Cold seal



New Packaging Film
Varnish or not
PE
Inks
Adhesive
PE high barrier



Monomaterial
All-PE, OPRL-compliant packaging solution



High Barrier
High barrier properties against oxygen & aroma

PCR-content films

>>> Go **FULLY CIRCULAR**



- Solutions with PCR-content films instead of virgin ones
- High performance materials – no output rate change
- Packaging functionality and aesthetics are maintained
- ISCC certification is required
- Availability may be limited depending on film type

Converting



FUNCTIONAL BARRIER COATINGS

>>> A more sustainable medium barrier solution

- Structure flexibility & simplification
- OTR ranges: 7 – 19 cc/m² (23°C / 50%rh)
- Lightweight packaging design
- Compatible with flexo / gravure printing
- Chlorine- and metal-free → reduced carbon footprint
- On-going project- under development



FLEXOGRAPHIC PRINTING

>>> Advantages of Flexo VS Rotogravure

- Less inks & solvents consumption
- Less scrap
- Less energy use
- Less greenhouse gas emissions
- Easy printing on more substrates, allowing the use of more sustainable & recyclable materials

Thank you!

>>> Get your packaging **READY**
for a new **SUSTAINABLE** era!

Dr. Lefteris Tourasanidis
R&D Director

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